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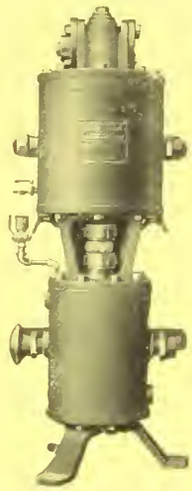

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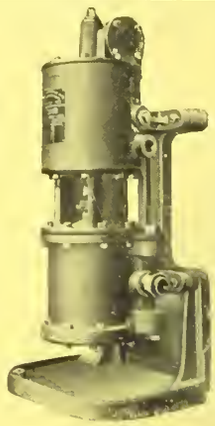
The man who uses compressed air appreciates the simplicity of construction, the simplicity of operation, the dependability and the adaptability of

Westinghouse Air Compressors



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There are a wide range of standard sizes and styles in the steam driven type to select from and any special conditions may be provided for by modifying the proportions of air and steam cylinders, as the conditions may require.

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Fare Box Repairs

This company maintains an efficient Repair Department, and makes a specialty of this class of work.

A large number of electric railways at the present time send shipments of portable boxes periodically to our Works for repairs, and we are equipped to give you prompt service on this class of work.

We can do this more efficiently and at less cost than you can do it in your own shop.

Write us for full particulars.

NEED STANDS

Coleman Fare Box Company, Limited

Manufacturers of Portable and Stationary Fare Boxes

WORKS: Tottenham, Ont.

HEAD OFFICE: 70 Bond Street, Toronto

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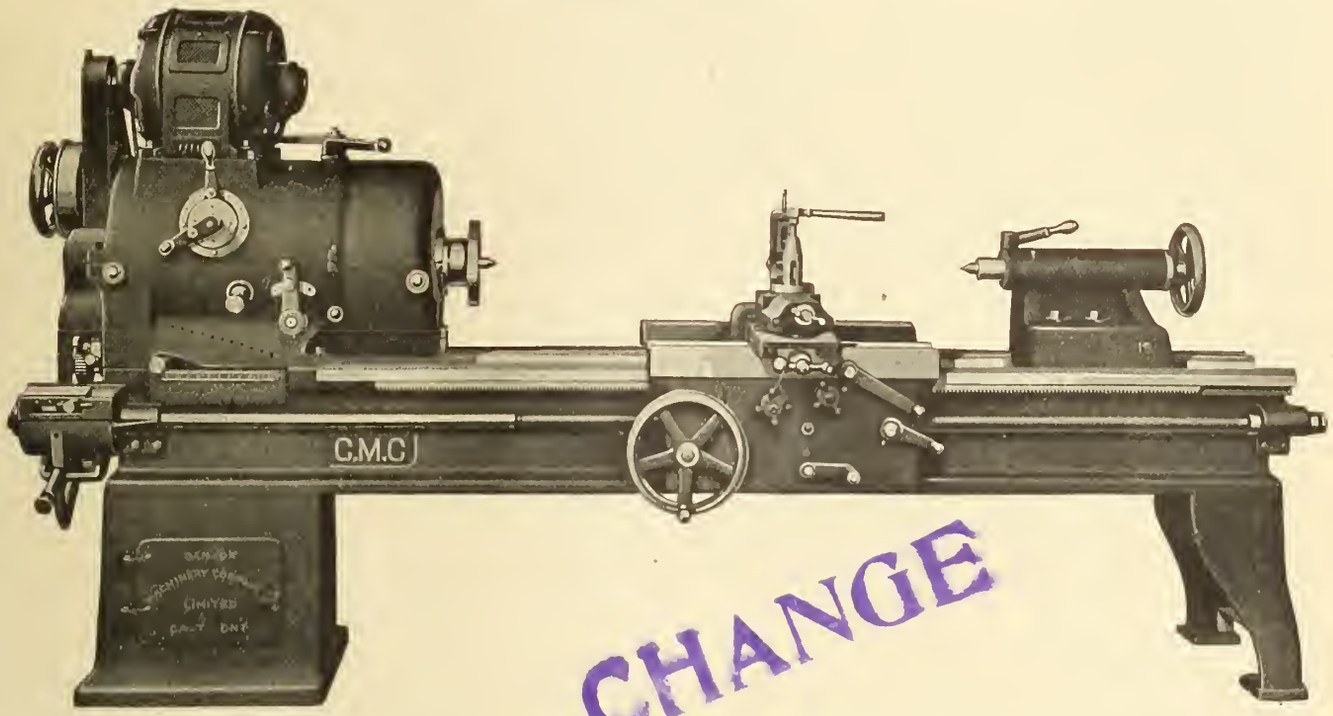

CHANGE

20" ENGINE LATHE WITH ALL GEARED HEAD

The all geared head shown in the cut illustrates the general design of our **All Geared Lathe Heads** in sizes from 16" to 26".

The great simplicity of the design is evident from the fact that **18 Spindle Speeds From One Motor Speed** are obtained by **13 Gears.**

The sliding gears are all made of steel, the teeth being machine rounded to facilitate entering into mesh.

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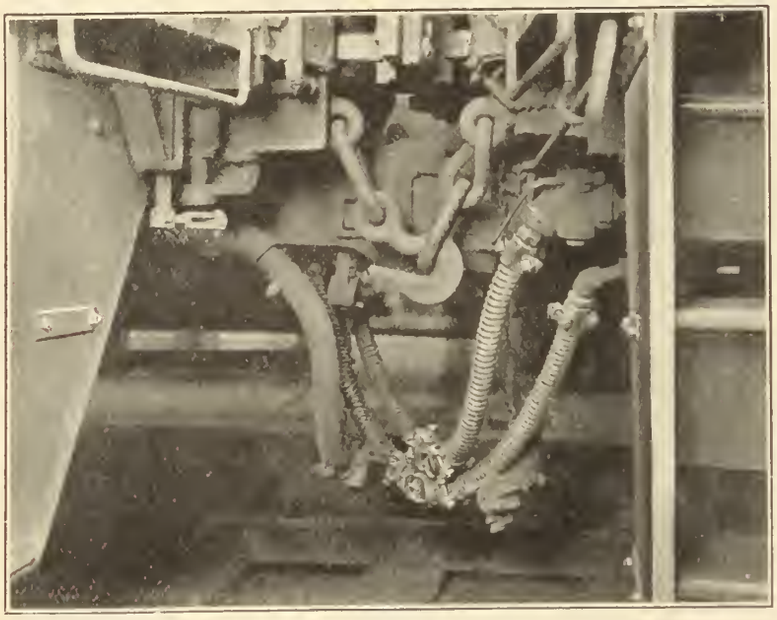
GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.

SPRAGUE STEEL ARMOURED HOSE
FOR RAILWAY SERVICE



Sprague Steel Armoured Hose on Passenger Equipment.

Sprague Flexible Steel Armoured Hose consists of a rubber hose completely covered with an interlocking galvanized steel armour, designed to withstand a test pressure of 1,000 to 2,000 pounds, depending upon the size. The ARMOUR RELIEVES THE RUBBER HOSE OF THE STRAIN DUE TO INTERNAL PRESSURE. It also ELIMINATES ALL DAMAGE to the rubber hose DUE TO CHAFING, FLYING BALLAST, ETC. As this is an extremely large item in air brake service, a VERY GREAT SAVING IS OBTAINED AS A RESULT.

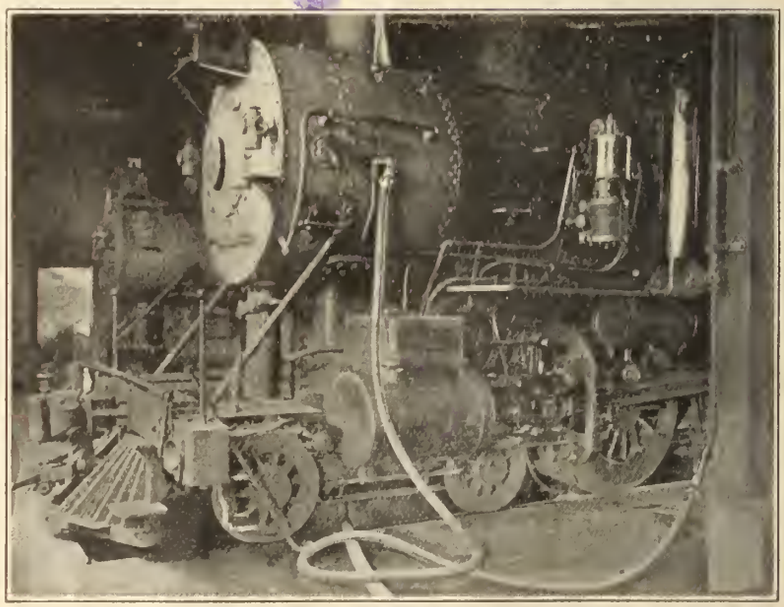
NO CHANGE

It is a recognized fact that there is nothing so hard on any hose as steam.

With steel armour, less expansion and contraction will result, and this should tend to increase the life of the hose.

Flexible Steel Armoured Hose has, in a large number of instances, given entire satisfaction, and has outlasted other classes of steam hose.

Flexible Steel Armoured Hose is manufactured for air brake, signal, locomotive tender, car heating, pneumatic tool, hot water, and general shop use.



Sprague Armoured Steam Hose in Round House Service.

CANADIAN GENERAL ELECTRIC COMPANY,
LIMITED

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

An Example of Good Lighting By Type W Flame Arc Lamps

The above is a photograph of the woodworking shop of The Eastern Car Co., New Glasgow, N.S., length 1,000 feet, width 90 feet, illuminated by twenty-two Type W Flame Arc Lamps. The diffusion is very good, and fine print can be read anywhere in the building.

The Eastern Car Co. have four buildings as large as the one photographed, all illuminated by Type W Flame Arc Lamps. They use a total of about one hundred and four lamps. Write our nearest district office for copy of Bulletin V 210.

CANADIAN GENERAL ELECTRIC COMPANY,

LIMITED

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

WE CARRY IN STOCK FOR IMMEDIATE SHIPMENT

70-TON STEAM SHOVELS

THE ONLY HEAVY DUTY STEAM SHOVELS
BUILT IN CANADA

70-C Steam Shovel.

We build in our Davenport Works, Toronto, Steam Shovels
70 to 110 ton, and carry a complete stock of repair parts.

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Manufacturers of:—Air Compressors, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Locomotives, Logging Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Turbines, Structural Steel Transmission Machinery, Turbine Pumps, Water Wheels.

HEAD OFFICES, TORONTO. District Sales Offices, Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

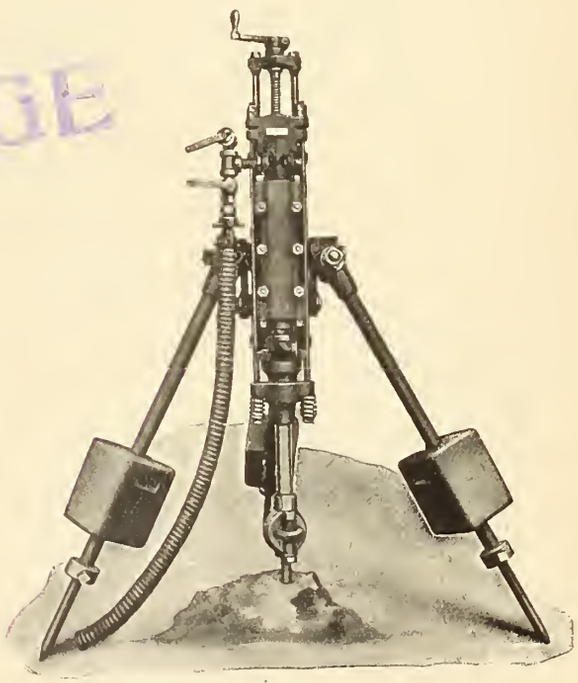
Contractors' Equipment

McKiernan-Terry Jacks

The McKiernan-Terry Atlas Ball-Bearing Jack is simple, sturdy, reliable. It can be elevated to one-thousandth part of an inch **and remain elevated with the load for any length of time.** This feature has been highly commended by contractors having delicate shoring operations to do. Its adoption by many prominent railway and steamship companies, bridge builders, contractors, quarrymen, miners and others who require apparatus for heavy lifting purposes, is sufficient proof of its merit.

McKiernan-Terry Drills

The Type "T. C." is a Corliss Valve machine, and differs from all other rock drills in which the valve is moved by mechanical or tappet action. It is actuated by two tappets which move freely within a tappet block seated in the cylinder beneath the centre of the valve chest. The tappets, by contact with the inclined surfaces of the piston, move up and down and so impart a rotary or turning motion to the valve, by which means it is operated. So well is it balanced, that the slightest amount of power is required to move it.



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Canadian Locomotives

for contractors, industrial works, railroads, etc.

CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 10 tons. Weight of tender in working order 150,000 lbs.

All locomotives are equipped complete with fittings, fixtures, tools and all appliances necessary for their operation.

If desired, we will furnish with all tenders on standard locomotives, complete detailed specifications, fully describing all construction features, with the various sizes of dimensions noted. Specifications can also be accompanied by photographs showing the type of locomotive proposed, with any modifications clearly mentioned.

We have had a half century's experience which may be useful to intending purchasers in selecting locomotives suitable for peculiar conditions, or where roads are not fully completed or surveyed.

Our plant is now being greatly enlarged. New equipment has been installed and the capacity of the works brought up to an output of about eighteen locomotives a month, which will soon be increased to twenty-five a month. Consult us before purchasing a locomotive!

Canadian Locomotive Company, Limited

Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

EDISON BSCO PRIMARY BATTERY

FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

EDISON-BSCO
Type 452 Cell,
450 Ampere Hours
Capacity.

A little study of the battery proposition in connection with mechanical interlocking plants shows the EDISON-BSCO cell superior to the gravity from all standpoints.

If the minimum current flow is .3 ampere the voltage of an equal number of cells of the two types is about the same, but if the maximum runs from .5 to 1 ampere, the multiple series arrangement must be used to overcome the voltage drop; the voltage of the EDISON-BSCO cells is not materially affected by such an increase in the current flow.

If the battery stands on open circuit for a portion of the time, gravity cells deteriorate, while the Edison suffers no ill effects.

While the multiple series arrangement of cells will increase the life of both types, it is not nearly as effective in reducing the maintenance cost of the gravity as the Edison. If, for example, sufficient cells were installed to bring the renewal periods one year apart, the Edison Cells would require no attention from the time set up until exhausted, while frequent attention would be necessary to keep the gravity in prime condition.

Furthermore, the greater uniformity of the Edison Cell makes it the more dependable battery, and its ability to withstand cold eliminates the necessity for extra heating often necessary with gravity cells.

Catalogue on request.

EDISON-BSCO
Complete Renewal

The Cheapest Form of Battery Energy

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

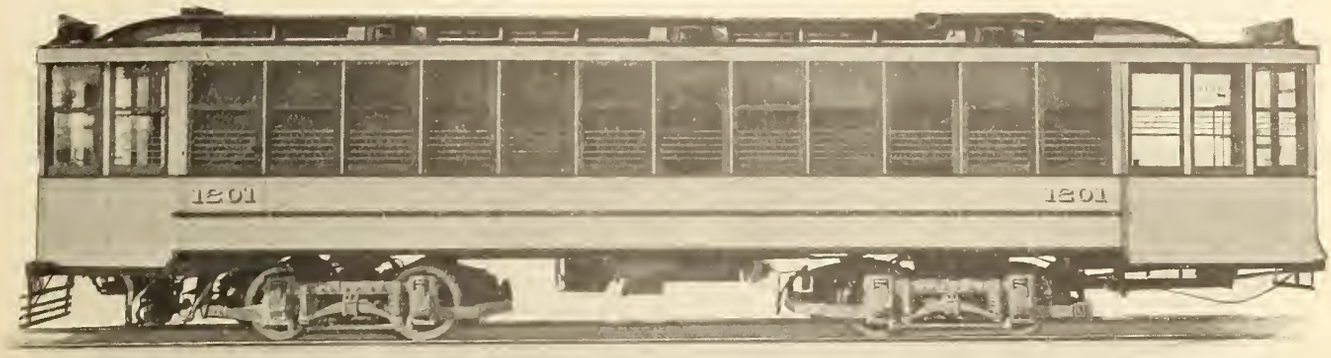
in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.



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Our plant at Tillsonburg, Ont., is now completed and we are in a position to give you early delivery on Electric Cars, Sweepers and Sprinklers.

It is modern in every respect and is equipped with the most up to date machinery.

Our organization is such that we can give your orders the best attention and ensures the turning out of equipment of the highest standard.

Let us figure on your next order.

THE TILLSONBURG ELECTRIC CAR COMPANY, LTD.

Office and Works, Tillsonburg, Ont.

THE

Steel Company of Canada

LIMITED

Railroad Track Equipment

Angle Bars Tie Plates

Steel Track Spikes Bolts & Nuts

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Foundry Basic Malleable

Car Axles and Forgings

Invincible Fencing

Bar Iron Bar Steel

Arm Braces Wood and Machine Screws

Copper Trolley Wire, Telephone and Galvanized Wire

Nails Tacks Wrought Pipe

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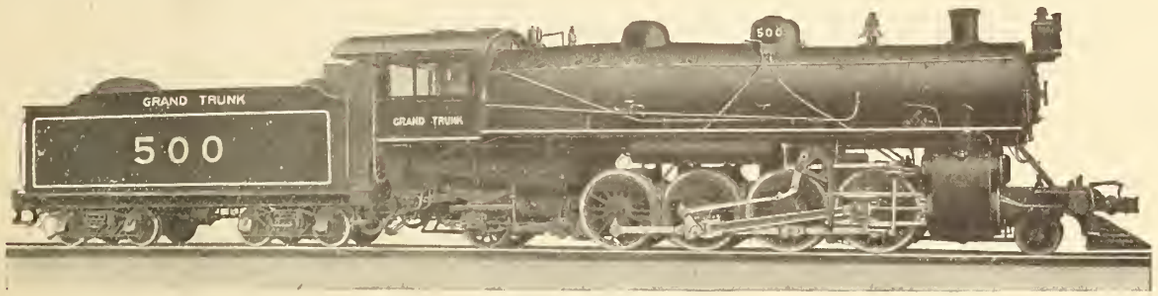
Geo. D. Hatfield, Halifax, N.S.

INCREASED TRAIN LOADS

MIKADOS VS. CONSOLIDATIONS



Total Weight of Engine, 283,000 pounds; Weight on Drivers, 213,500 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 175 pounds; Cylinders, 27 x 30 inches; Maximum Tractive Power, 51,700 pounds.

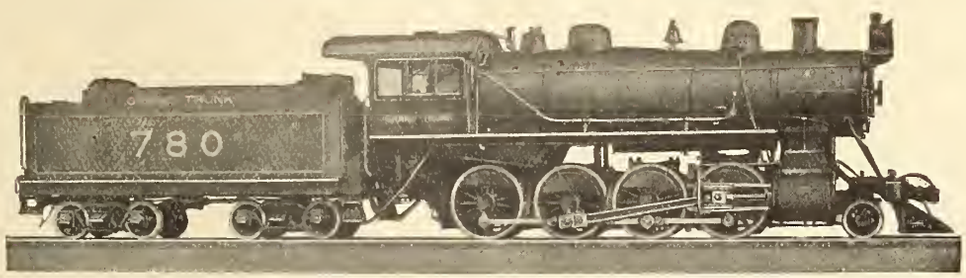
The substitution of Mikado locomotives for Consolidations on the Grand Trunk Railway System has enabled that road to greatly increase train loads and to properly provide for the growth of freight traffic.

This is shown by the following ratings that have recently been put into effect on the Western division:

	Miles	Helper Service	Consolidation	Mikado	Increase
Port Huron to Nichols	156½	None	2000	2800	40%
Nichols to Elsdon	168½	None	1700	2500	47%
Elsdon to Nichols	168½	For 5 miles	2000	2800	40%
Nichols to Port Huron	156½	None	2000	2800	40%

The Western division is made up of broken grades not exceeding 0.6 per cent., except a 5 mile 0.95 per cent. grade from Sedley to Valparaiso, where a helper is required.

Fifty additional Mikado locomotives are now being delivered by this company to the Grand Trunk Railway System.



Total Weight of Engine, 212,000 pounds; Weight on Drivers, 186,000 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 210 pounds; Cylinders, 22½ and 35 x 32 inches; Maximum Tractive Power, 34,400 pounds.

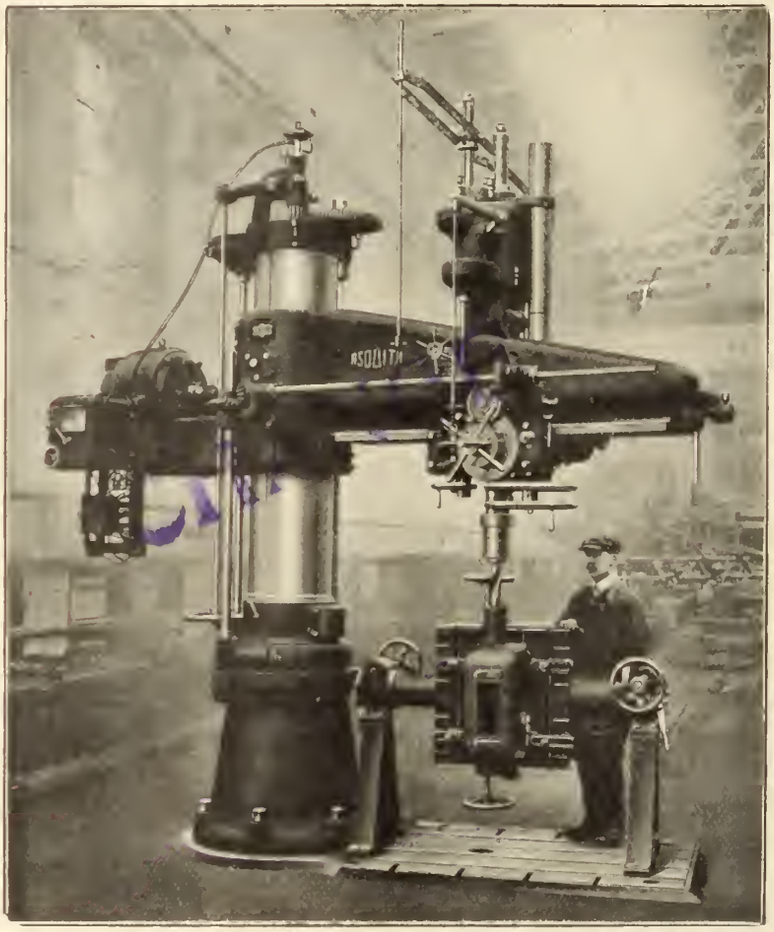
MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

ASQUITH RADIALS

Built in the Following Sizes:

5' 0" Radius
6' 0" "
7' 0" "
8' 0" "
9' 0" "
10' 0" "



Weights:

5 Tons
7½ "
10½ "
16 "
17½ "
21 "

6' 0" Central Thrust, High Speed, Radial Drilling, Tapping and Studding Machine

The above illustration shows the type of Drill used all over the world by manufacturers who are making money by high production.

Get into line and be independent, as these Drilling Machines will do more towards increasing your profits than any other drill on the market.

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Uniformity

STANDARD OPEN HEARTH A-RAIL.

Chemical Analysis.

	Ladle Test	Top of Head	Web	Flange
Carbon ...	0.75	0.67	1.03	0.73
Manganese .	0.80	0.705	0.711	0.698
Phosphorus .	0.021	0.023	0.045	0.025
Sulphur	0.044	0.026	0.068	0.032
Silicon	0.13	0.13	0.13	0.14

TITANIUM-TREATED OPEN HEARTH A-RAIL —(0.10 TITANIUM).

Chemical Analysis.

	Ladle Test	Top of Head	Web	Flange
Carbon	0.62	0.58	0.65	0.61
Manganese .	0.79	0.679	0.705	0.692
Phosphorus .	0.016	0.022	0.025	0.024
Sulphur	0.041	0.027	0.030	0.029
Silicon	0.05	0.10	0.10	0.10

The effect of TITANIUM-treatment on this most desirable feature is clearly shown in our Rail Reports—Bulletins Nos. 1, 2 and 3, from which this data was taken.

Standard Open Hearth A-Rail

Physical Tests

	Head	Web	Flange
Impact Resistance	1.00	0.82	1.03
Hardness	219	253	215
Endurance	1065	540	1250

Titanium-treated Open Hearth A-Rail

Physical Tests

	Head	Web	Flange
Impact Resistance	2.10	1.55	2.63
Hardness	210	221	212
Endurance	1070	960	995

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents. Process and Products Patented.

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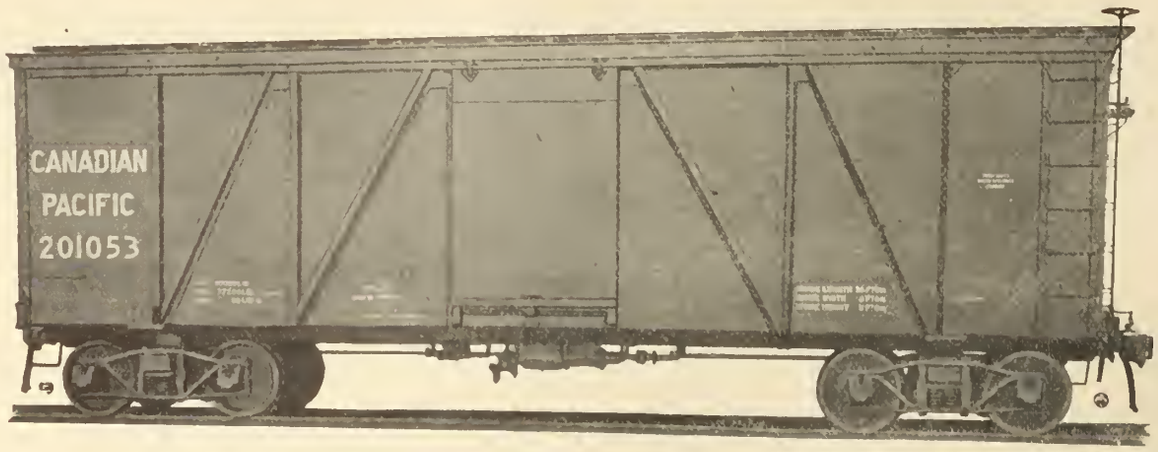

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T. H. & B. Ry. 40 Ton Steel Underframe Flat Car

Bath Tub Bolster construction.

The operating organization of this company is composed of men who have had international experience in the construction of railway rolling stock. The plant is equipped to build freight, passenger and electric car equipment of all classes, and is in a position to give prompt delivery.

Manufacturers in Canada of Damascus Brake Beams and Brascott Ladders

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Western Union Code
Cable Address "Nasteel"

Works and Operating Offices
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Here's Exactly Why Engineers Recommend

Scherzer ROLLING Lift Bridges

"Used All Over The World"

Designed on the Universal Rolling Principle

200 Scherzer Rolling Lift Bridges now in succ ssful use in the

United States, Canada, England, Ireland, Wales, France, Holland, Belgium and other countries.

Egypt, Russia, India, Burma, Hawaiian Islands, Mexico, South America.

Notice the simple, rigid, riveted one-piece movable bridge. Extraordinary simplicity and rigidity—greatest efficiency at less cost.

Some Reasons Why The Scherzer Rolling Lift Bridges Are Recommended by Engineers the World Over—

It is a riveted complete rigid structure.

Truss has no pin connections.

Very little machinery in structure—about 5 per cent. of total metal. (Machinery costs about three times as much per lb. as structural steel.)

Over 50 per cent. less MACHINERY than a design with trunnions.

So perfectly balanced as to require little power to operate.

Cost of maintenance low.

Raised and lowered without shock.

Less metal than other designs.

Gives maximum clearance of waterway without fender piles.

Machinery or truss not exposed to damage by boat lurching to side.

Concentrated loading at any point not as great as on a trunnion.

Counterweight is fixed. Height of counterweight not much over ordinary truss.

No high towers.

All parts easy of access.

No costly trunnions or heavy castings liable to be displaced.

No uplift to overcome before bridge commences to rise.

Requires shorter piers than a trunnion.

Trusses roll in direct line of standard distance c. to c. of ordinary trusses.

Grade of railway or bridge could be raised in a simple manner.

Scherzer ROLLING Lift Bridges cost less to install, operate and maintain—because they are simple, rigid, riveted structures with less metal than any other movable bridge and far less machinery. They are balanced in all positions, minimizing motor power. Their base is rounded just enough to let them roll forward and down, closing them; or roll back and up, opening them. This forward and back motion saves large amounts in material, weight and motive power, as a much shorter span can be used. When open, the bridge is back, away from the channel, preventing accidents from moving boats.

No friction-causing axles, journals or trunnions are used to carry the bridge. There is nothing to lubricate but the small motor and very simple machinery. The curved base rolls on level tracks, using the simple principle of track and wheel used by all railroads. The foundations naturally cost less because the bridge weighs less. No wharfage is needed on either side. New bridges can be added beside the old ones, avoiding wasteful replacement.

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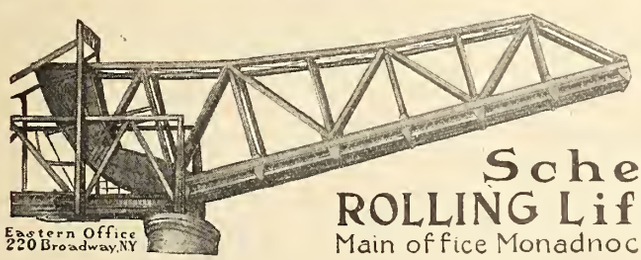

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Scherzer ROLLING Lift Bridge Co.

Main office Monadnock Block Chicago, U.S.A.

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Practically every railway man who keeps himself informed, knows in a general way, that there is such a thing as the Simmen System of Signaling, knows that it involves the use of the cab signal, and has a general idea of its workings.

In calling on railway men, however, we find that a great many of the men who most need the information least realize what the Simmen System can do **for them.**

We can confidently assure every railway man that it is worth his while —as a cold dollars and cents proposition, to know exactly, definitely and fully, not only what the Simmen System is in its methods of working, but how the Simmen System will solve the individual signaling requirements of a given road.

We don't care whether you are now in the market for signaling protection or not. We will be perfectly willing and very glad to send to your office a competent man who will tell you briefly and exactly what the Simmen System can do for you as applied to your individual operating conditions.

We will do this without any obligation on your part, and then if you want it, we will be glad to make a survey of your road with respect to its signaling requirements and to put before you a definite proposition for protection under the Simmen System.

It is just as much worth **your** while to know what the Simmen System has done for others and can do for you as it is worth **our** while to tell you; and it is on this basis of mutual interest and advantage that we say that if you will drop us a line telling us you want to know all about the Simmen System as applied to your conditions, we will send a man to tell you.

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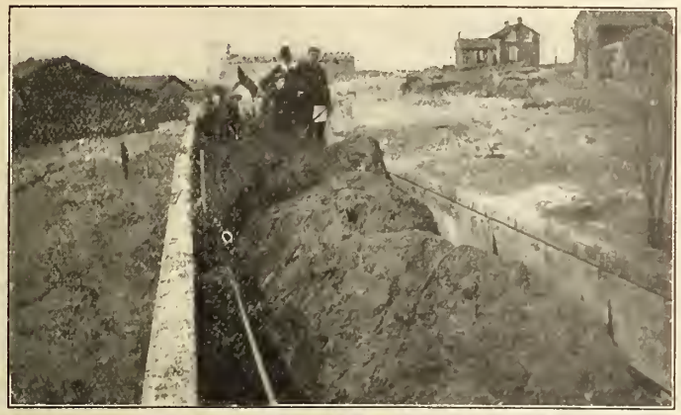
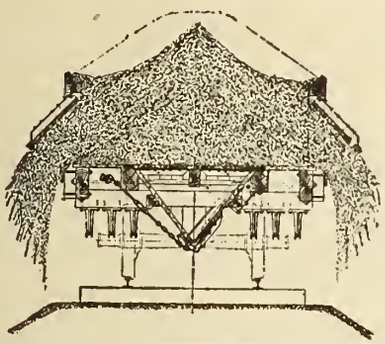
HART CONVERTIBLE CARS ARE MONEY SAVERS IN BALLAST WORK



In Construction Work with Side Plow and Lidgerwood Car

In Ballast Work Center Dump with Rodger Double Plow Distributing Car



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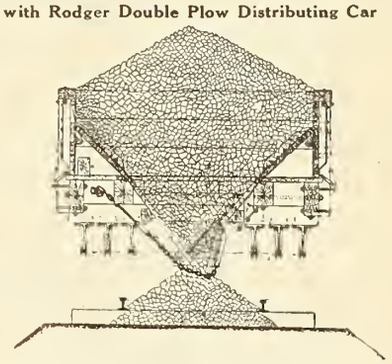

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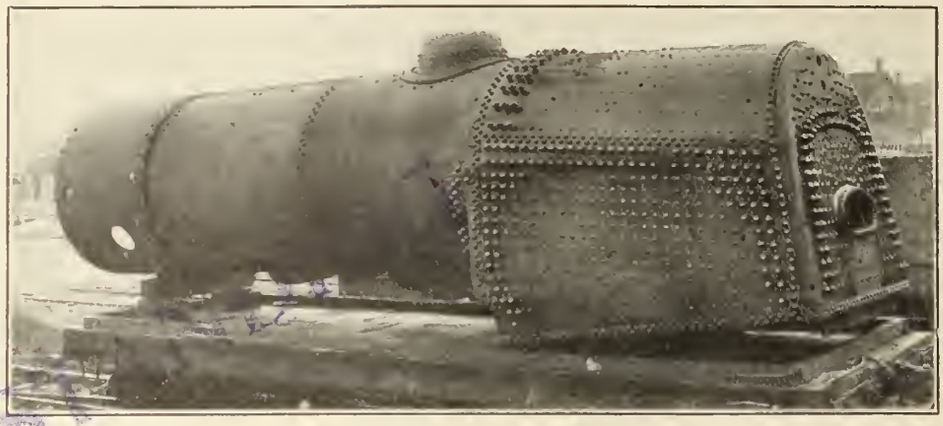

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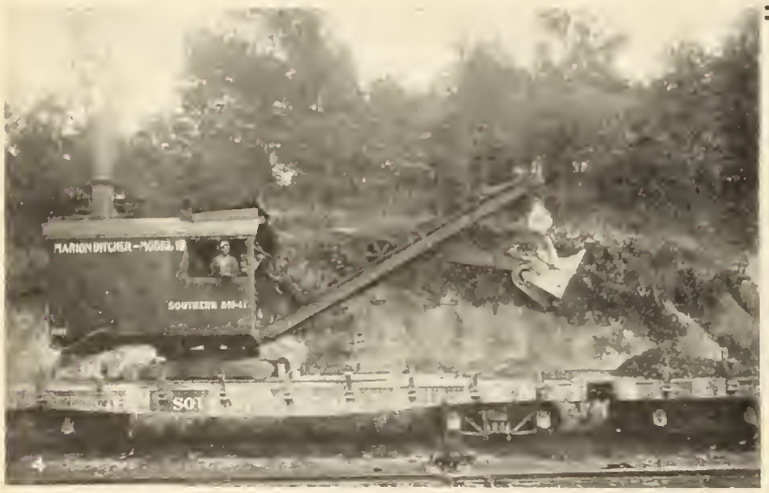

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ROLLING STOCK

Passenger, Freight and Electric Railway, Car Castings, Forgings and Repair Parts.

CROSSEN CAR COMPANY, LTD.

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Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

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ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

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We are largest manufacturers in Canada of this class of work

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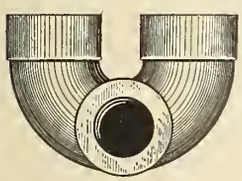

Fig. 933

R. & L. Coupling

Fig. 932

Tee

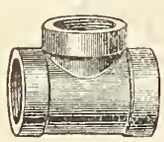

Fig. 927

Double Tee

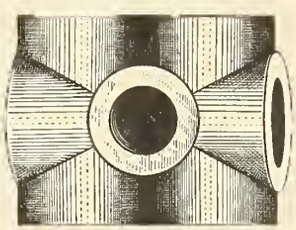

Fig. 937

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Are a part of the standard equipment of many of the largest railroad systems. They are wonderfully efficient, and have won their way about as fast as we could keep up with their manufacture. Batteries of presses are cutting millions from specially rolled bars. May be you don't know what this device really is, or will do. We would be glad to tell you and show you. Let us send you samples free.

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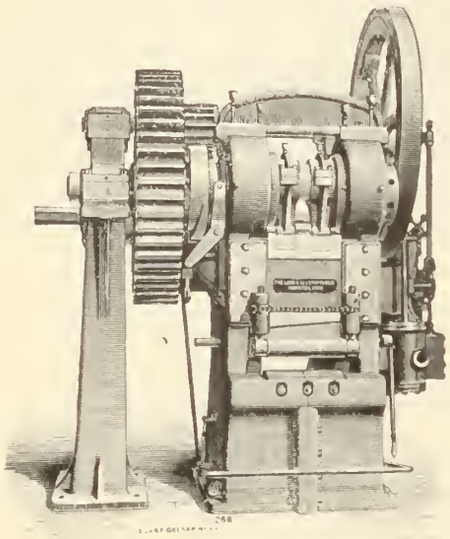
POWER PUNCHING AND SHEARING MACHINERY



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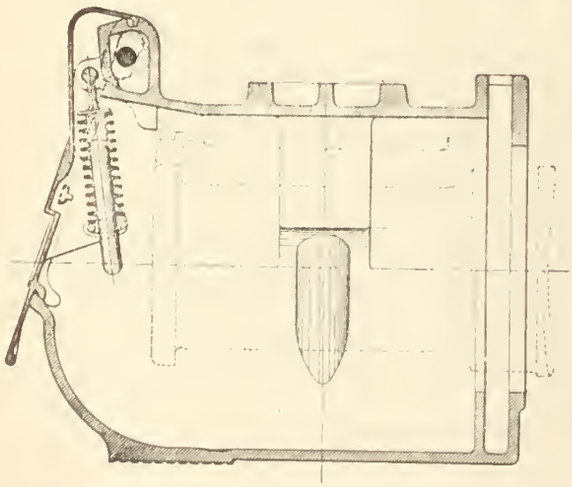

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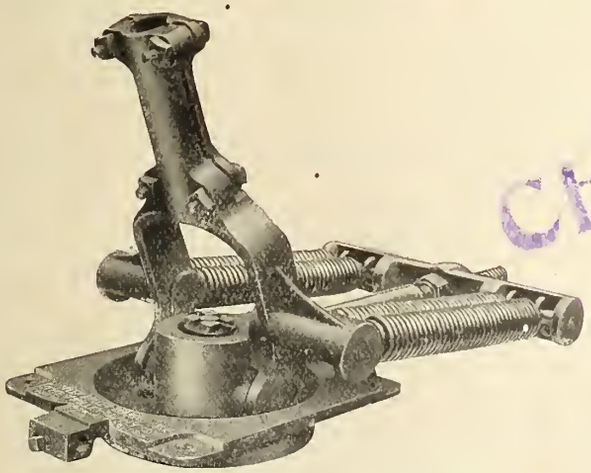
Which have won an enviable reputation over all the world. These devices are installed on almost every line in Canada



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Installed in R. & O. S.S. "RAPIDS PRINCE" and C.G.S. "DOLLARD."

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Represented by

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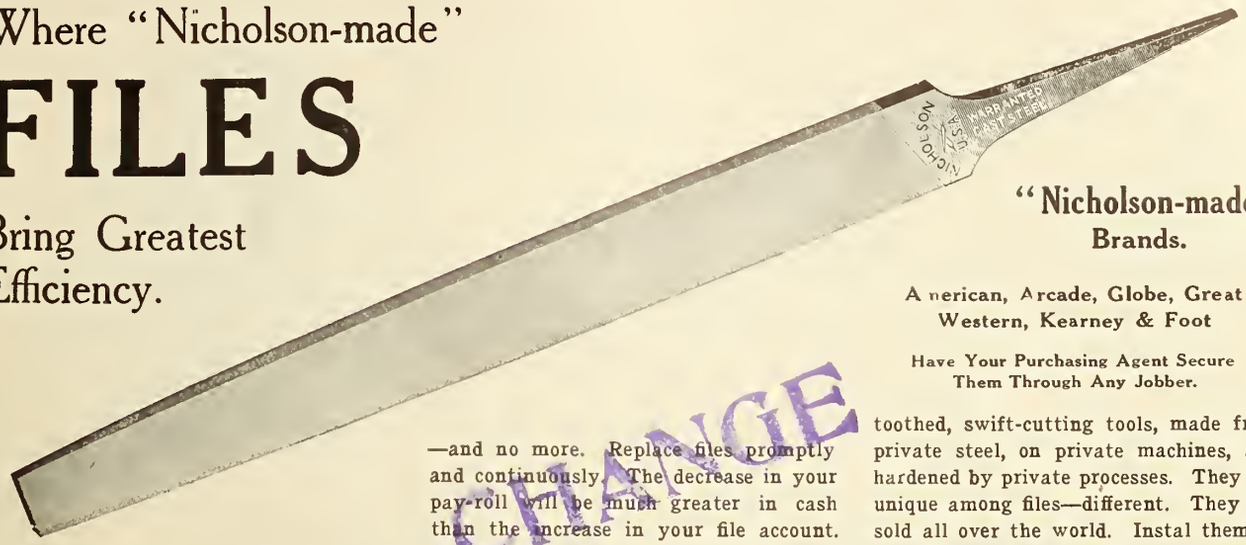

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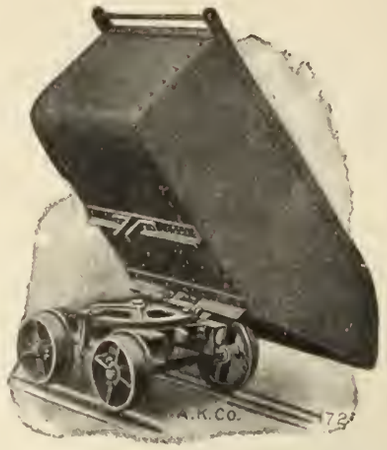

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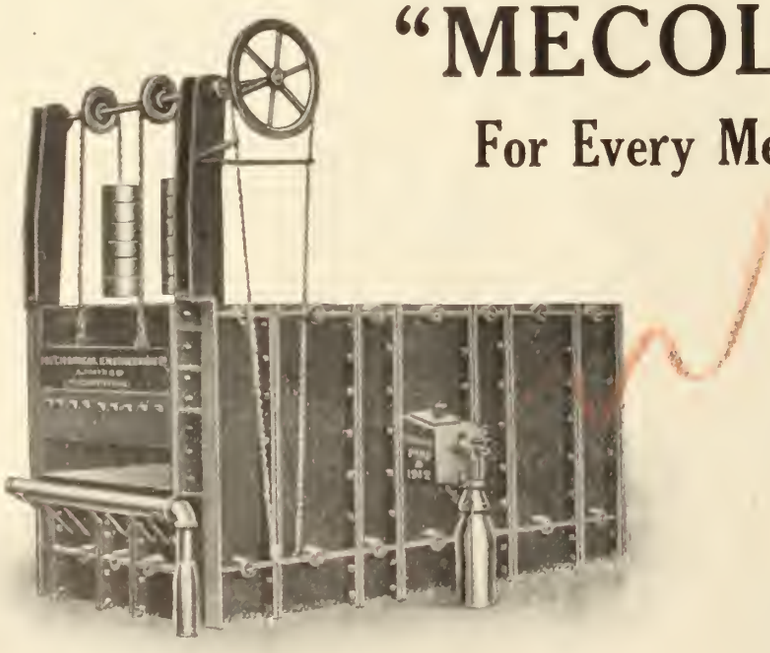

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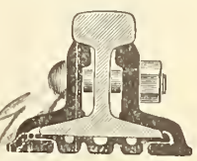

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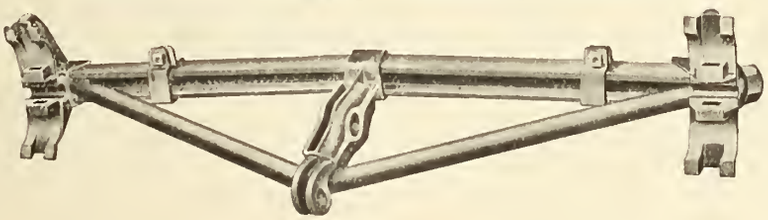

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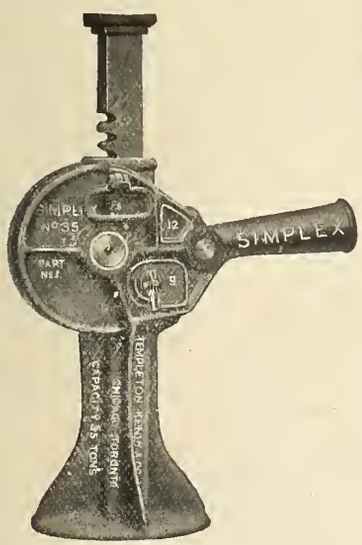

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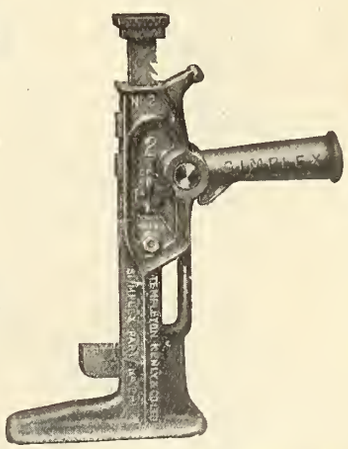

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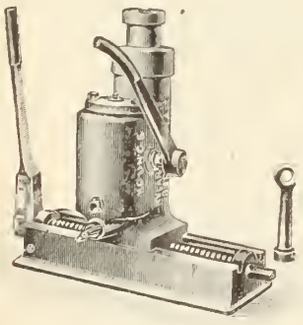

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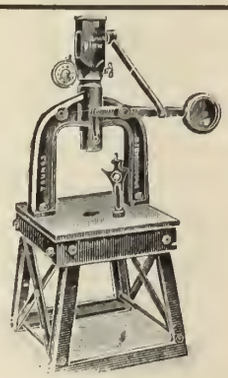

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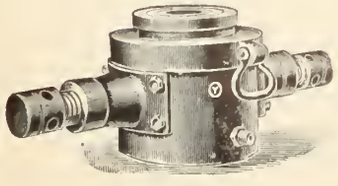

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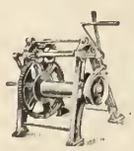

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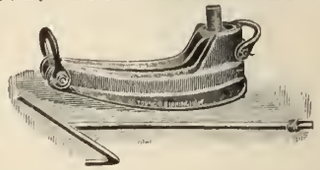

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H.R.D. Steel is tougher and stronger than any other Tool Steel made and carries a finer edge.

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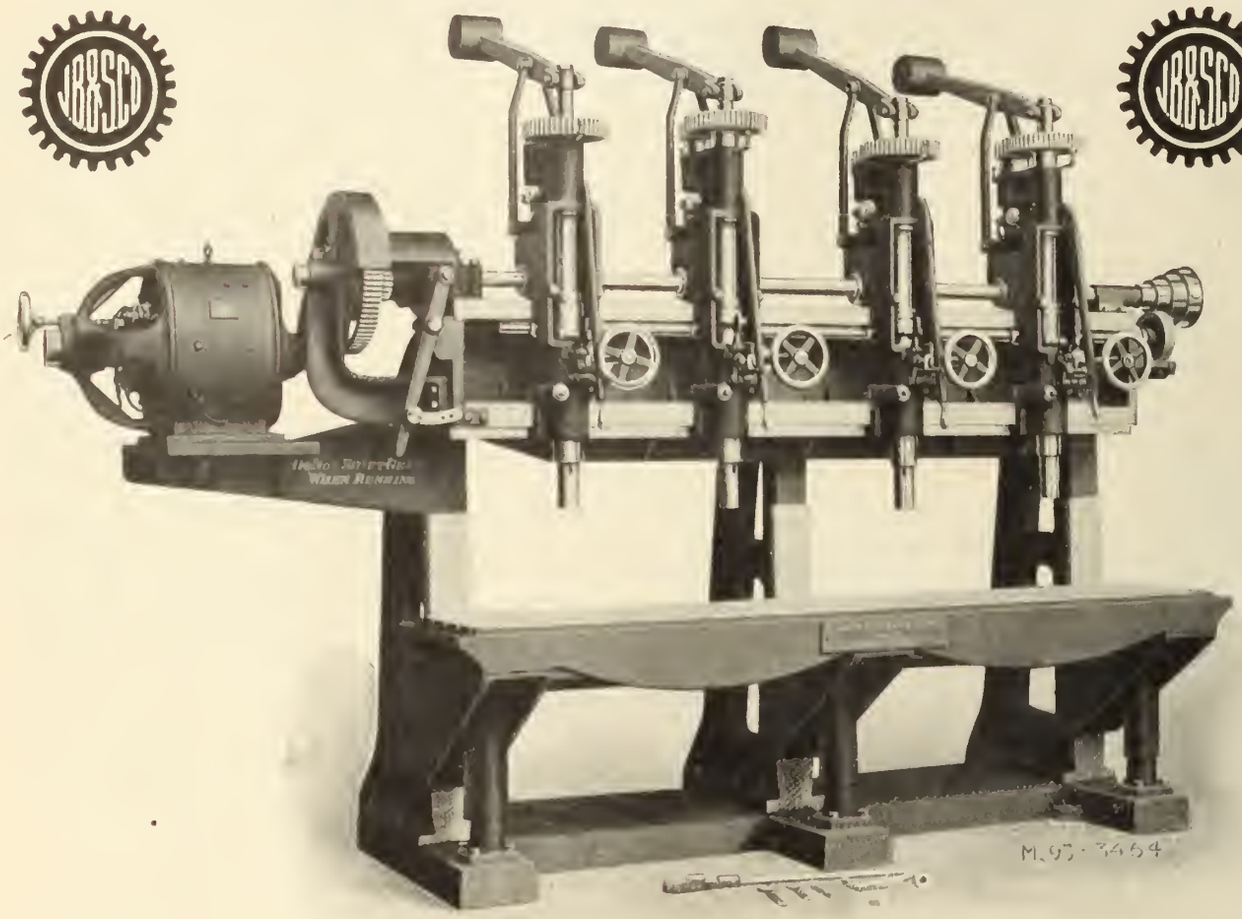

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Canadian Railway and Marine World

January, 1914.

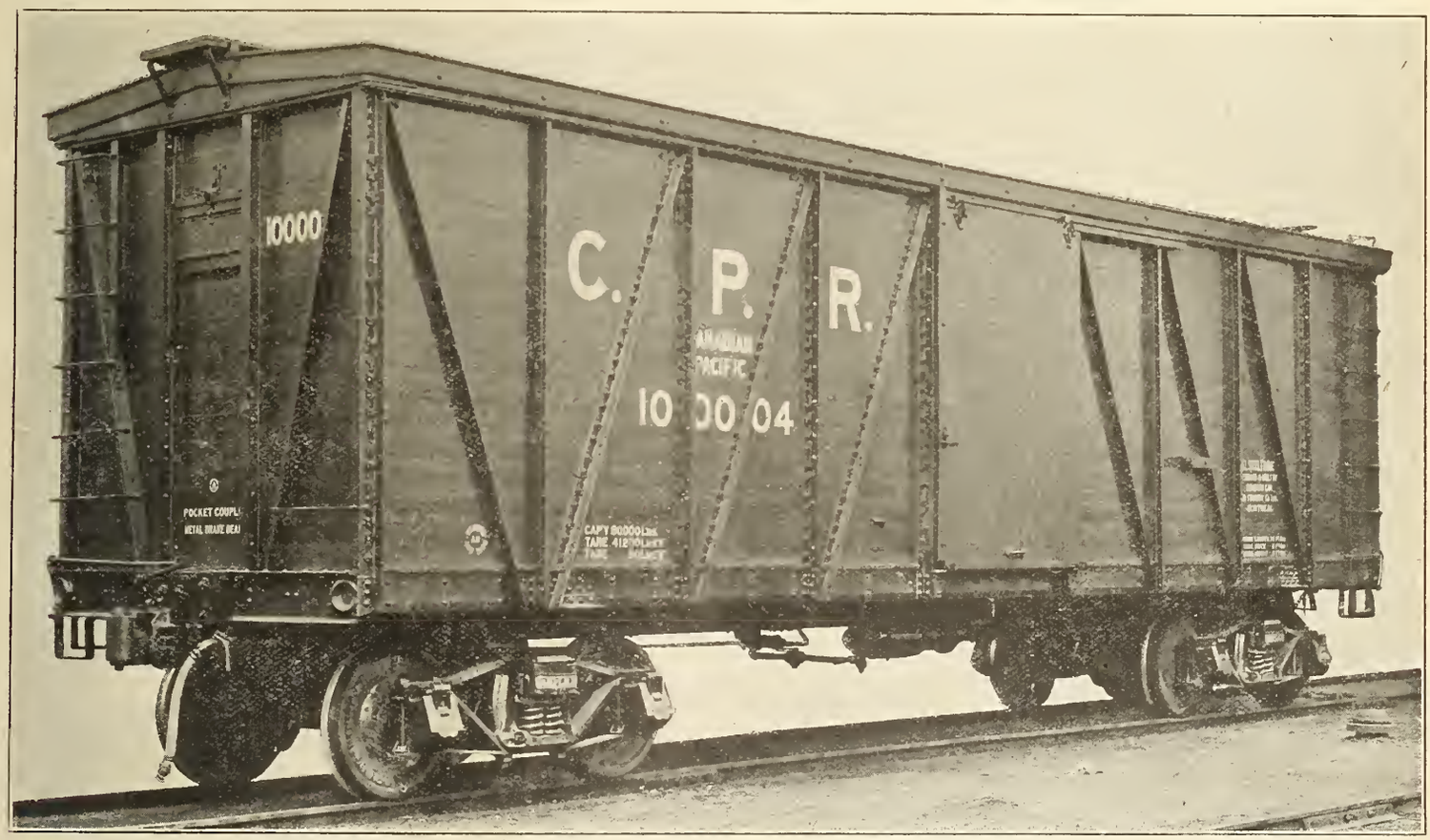
The Construction of Steel Upper Frame Box Cars.

By R. W. Burnett, General Master Car Builder, Canadian Pacific Railway.

[ABSTRACT OF PAPER.—This paper outlines the development of the box car from the all wood car to the steel under and upper frame constructions now so exclusively in use, and discusses some of the factors that have been effective in establishing steel frame construction. The advantages of the steel upper frame construction are discussed in particular, and the practice of the C.P.R. in construction and repairing is referred to in detail. The advantages that this type has over the wooden superstructure car, which are of value to the operating traffic and mechanical departments of wooden superstructure cars. Immunity from serious damage to superstructure in wrecks. Protection to roof due to the stiffness of the superstructure. Minimum clearance at eaves.]

This paper, which is confined solely to superstructure details of the steel frame box car, is intended to apply in general to steel frame practice as developed in connection therewith. While the early development of steel upper framing is passed over rather briefly, many of the important considerations that have influenced its adoption are discussed in detail, particularly as Jan., 1910, that I have thought it unnecessary to go over this same ground, but will review only briefly the development of the box car from the all wood car through the intermediate stages of steel underframe cars.

The original wooden car, with the single spring draft rigging having the check castings bolted to the sills, gave little if any more trouble than modern equipment, due principally to the shorter trains, lesser density of traffic, and to the use of link and pin couplers which compelled gentler handling of trains than is prevalent today. The steel underframe car was built mainly to



First Inside Sheathed Steel Frame Box Car for Canadian Pacific Railway.

the railways are enumerated as follows: Low tare weight. Clean inside finish. Ease, with which it can be cleaned and kept clean. Answers the purpose, when built with rolled shapes, of a standard car as regards the low cost of maintenance and small amount of material necessary to keep in stock for repairs, and the fact that repairs can be made by the company on whose line the car is without any special tools or dies. An economical car to build, both as regards size of plant and cost of equipment required. Does not deteriorate more rapidly in service than when idle. Small percentage out of service for repairs. Protection against losses from leakage and damage from weather. Much longer life than viewed by the Canadian Pacific Ry. The information and data presented are based on the writer's experience in this railway system in connection with the design, construction and maintenance of 30,000 cars of this type, which represent an investment of $30,000,000.

Credit is due to C. A. Seley, Mechanical Engineer, Rock Island Lines, for designing the first outside sheathed steel superstructure box cars that were constructed in large numbers. The introduction of steel into the superstructure of the box car, and the development of the outside sheathed steel superstructure in particular, were discussed so thoroughly by Mr. Seley in a comprehensive paper before the Franklin Institute in secure a stronger centre construction for the attachment of draft rigging and to get away from the trouble caused by wooden sills breaking and splitting, broken draft bolts, etc.

While having many advantages over the old wooden car, the steel underframe car developed some troubles peculiar to itself, the most important being due to the fact that the body being carried on a rigid frame and not held together by the strains resulting from its weight, as in the old trussed cars, has a tendency to develop slack in the superstructure. This in turn affects the roof and sheathing. One principal trouble with outside sheathed cars is that, after they have been in service a compara-

tively short time, the sheathing frequently loosens at the end sill, and at the side sills near the bolsters, with resultant leakage of grain.

There were some steel frame box cars built previous to 1909, but the writer has been able to secure data on only the outside sheathed types. Of these, 2,700 were in service on the Norfolk and Western, of

Steel Frame of Canadian Pacific Railway Box Car Ready for Lining.

which the first 100 were built in 1902; the owners advise they were satisfactory, and the same type has been purchased on subsequent orders. The Rock Island and Frisco lines had in service at that date approximately 5,000 cars similar to the Norfolk and Western, and these also appear to have given satisfaction as the owners have reordered the same type several times. All of these, however, were outside sheathed, and as regards leakage at the sills, had comparatively little advantage over the wooden cars. Recently both of these lines have purchased some inside sheathed cars.

In 1908 the C.P.R. designed a steel frame inside sheathed box car. This car avoided the disadvantage of the outside sheathed car which had not been accomplished by the steel frame cars constructed up to that time, and at once obtained a further reduction in weight and provided for cheapness of maintenance by the use of steel superstructure, without the additional lumber required by the outside sheathed car. With practically no preliminary experimenting, 500 of these cars were built and over 30,000 have been built since similar to the first cars, with the exception of several refinements of details, such as corner and door posts, end doors and side plates, and joining of flooring and lining. These changes have not affected the general design of the car, but are the improvements that have been introduced from time to time to reduce weight and simplify the construction.

The steel frame outside sheathed car has several advantages over the types previously used, notably in that the tare ton weight is low in proportion to the capacity. There is such a variation in the figures used for the cost of hauling per ton mile, that no attempt is made to say what the saving would amount to, but certainly the advantage of having a car equal, if not superior to other cars in all respects, weighing from 1,000 to 5,000 lb. less, will appeal to all traffic and operating men. Not only is there that much less dead weight to haul when the car is empty or partly loaded, but additional lading can frequently be carried. The actual limit on the paying load that can be carried in a properly designed car is the total weight on the axles. Thus, a car having 5 in. by 9 in. axles, with such a tare weight that, when deducted from the capacity of the axles, allows the car to be safely loaded to 88,000 lbs. could, if dead weight be reduced by 3,000 lbs., safely carry a paying load of 91,000 lbs. and retain the same strength. Thus the actual capacity of the car is increased almost 4% with a better ratio of paying to dead load.

With the wooden superstructure it had been thought necessary to assist the superstructure by heavy roof construction, some going so far as to use different methods of diagonal bracing, but with the steel car it has been found that there is no appreciable local movement of the framing in the heaviest service, which makes a simple proposition of the roof, as it has only to take care of itself. This presents a simpler problem to roof designers, making it possible to design a roof much lighter, without necessity for use of purlins or ridge poles to strengthen the car. It is obvious that unnecessary weight in the roof raises the centre of gravity, and increases the tare weight and cost and has other disadvantages.

In explanation of the local movement of this style of framing, it is well to mention tests we have made in jacking up this car, which demonstrated that the car would take a gentle twist from end to end, allowing the bolsters to be slightly out of the same plane horizontally. This twisting was accomplished without any perceptible local distortion of the sides or ends. The capacity for twisting is a condition to be desired as it allows a car to adjust itself to uneven track conditions.

In addition to being 5½ in. narrower than the outside of the sheathing of a wooden car, the superstructure of the C.P.R. car is protected by the framing, so that a side swipe that would do serious damage to an outside sheathed car frequently does not touch the lining and is resisted by the framing without damage to the posts or braces. Frequently it is found that a side swipe that would almost demolish the sides of a wooden car only bends the steel framing, and in making repairs, the lining is merely removed, posts and braces strengthened and the original lining replaced, the whole cost being the comparatively small labor charge. Jacking frames are being installed at all of our principal repair points for all classes of steel cars, and while not original with the C.P.R., have been amplified better to take care of steel frame box cars. With these frames, many jobs that would require the car to be cut apart, taking several days, can be done in a few hours without cutting rivets. With modern steel frame cars, these jacking frames are as much a necessity as the blacksmith shop or any other part of the shop.

With the outside sheathed car it is difficult to clean a car properly when it is unloaded, on account of grain lodging between the framework, and also on account of the opening where the posts and braces meet at the bottom becoming obstructed, resulting in grain being retained between the sheathing and lining with resultant complaints from shippers. All of this is overcome by the clean joining of the lining and the floor in the steel frame cars, and it is believed a change of this kind would have come years sooner if designers had kept in close touch with service conditions. One advantage of the steel frame car is that outside of possible repairs due to wreck damage and to wear and tear of couplers, wheels, brake shoes and journal bearings, the car does not deterlorate more rapidly in service than when stored.

The grading of lumber for use in these cars is an item that has received much consideration. Yellow pine or fir has so far been the principal lumber used, although we have experimented to some extent with spruce. Spruce has the advantage of being lighter, but it seems to be more difficult to dry it sufficiently for this purpose. Great pains have been taken to avoid knots that are too large or numerous, and while it is generally desirable to have lumber as free from knots as possible, I have never, in the inspection of many hundreds of cars, seen where a knot had fallen out. It is, however, desirable to have lumber as free from sap and shakes as possible and thoroughly dry.

When the first of these cars were built outside of the C.P.R. shops we had considerable difficulty in getting the lumber properly dried, due to lack of both experience and facilities on the part of the car companies. We have about 3,000 cars on which the lumber has shrunk and given them a bad appearance, but this result was expected, as when the cars were built the lumber was quite green. The sheathing on these cars could be tightened for less than $4 a car, but very few have been tightened, owing to receipt of practically no reports of loss or damage to lading due to the shrinkage; also as they do not frequently reach our main repair tracks, being shopped only for such repairs as wheels,

REPORT OF MOISTURE IN LUMBER FOR LINING BOX CARS.

Built by ..... At .....

C. P. R. Equip. Order No. ..... For ..... Number of Cars .....

Report No.....

Moisture determination strictly in accordance with C. P. R. Spec. No. 243 C.
Samples obtained every other day during construction, with a minimum of one sample for each one hundred cars built. Result of each test must be promptly recorded on this sheet and sent to R. W. Burnett, Gen'l. M.C.B., Montreal.

Lab. No.	Date of Sample	Cars Completed	Car Nos. Represented	Moisture Per Cent.	Average To Date	Orig. Width Inches.	Shrinkage Inches	Average To Date Inches	REMARKS

Form Used by Canadian Pacific Ry. for Reports on Moisture Determination on Lumber.

or wreck damage, we have not considered it advisable to shop the cars for a defect which is almost entirely a matter of appearance. The lining shrinks as much in two months of summer weather as it ever will.

The lining should not be matched before drying, as it warps and curls, rendering it difficult to make a tight joint. The rough size of lumber should be at least ¼ in. greater than finished dimensions. In establishing limits for drying lumber no information or data could be secured whatever, and after experimenting we came to the conclusion that a piece of this lining of full cross section, subjected to a temperature averaging 170 deg. fahr. for 96 hours, should not lose more than 6% in weight, and that lumber represented by samples losing more than 10% must not be used until further dried.

The variable condition of the lumber when taken from the yard makes it necessary to use careful judgment as to the length of time it should be kept in the kiln. At the C.P.R. Angus shops this responsibility falls on the wood mill foreman, whose constant attention to this feature makes him the best fitted for the purpose. The average moisture loss reported by the test department for lumber used on cars now building at the Angus shops is 5.25%, which shows that we are getting very satisfactory results from the kilns. A number of tests were made last year on lumber taken from the yard. These tests showed a moisture loss of between 25 and 30%, which shows the importance of drying lumber properly. The accompanying form is used for reporting results of tests both at Angus and outside shops.

Due largely to our insistence, nearly all of the car plants in the country are now equipped with dry kilns, and any possible additional cost of drying lumber in excess of what has been considered good practice in the past would be less than $1 a car. Such drying would make the car side practically the same as one board, so that it is absurd that the possible shrinkage of lumber should be considered as any reason for this type of car not being built. It has been claimed that lumber can be so dried that it will swell and bulge, but we have never found this to occur. We have had cases where lumber slightly moist has dried more rapidly on the inside, due to that side not being painted, and made the outside of the boards slightly convex, with tight joints that could be easily mistaken for swelling, whereas the opposite is the case. We have kept a car with very green lumber in the passenger shop, with a high temperature, for over a month, until the lumber was absolutely bone dry, and then put it outside, with doors open through four weeks of constant raining spring weather, with the result that there was no closing of the cracks that could be detected, which further proves that there is nothing to be feared from lumber being too dry.

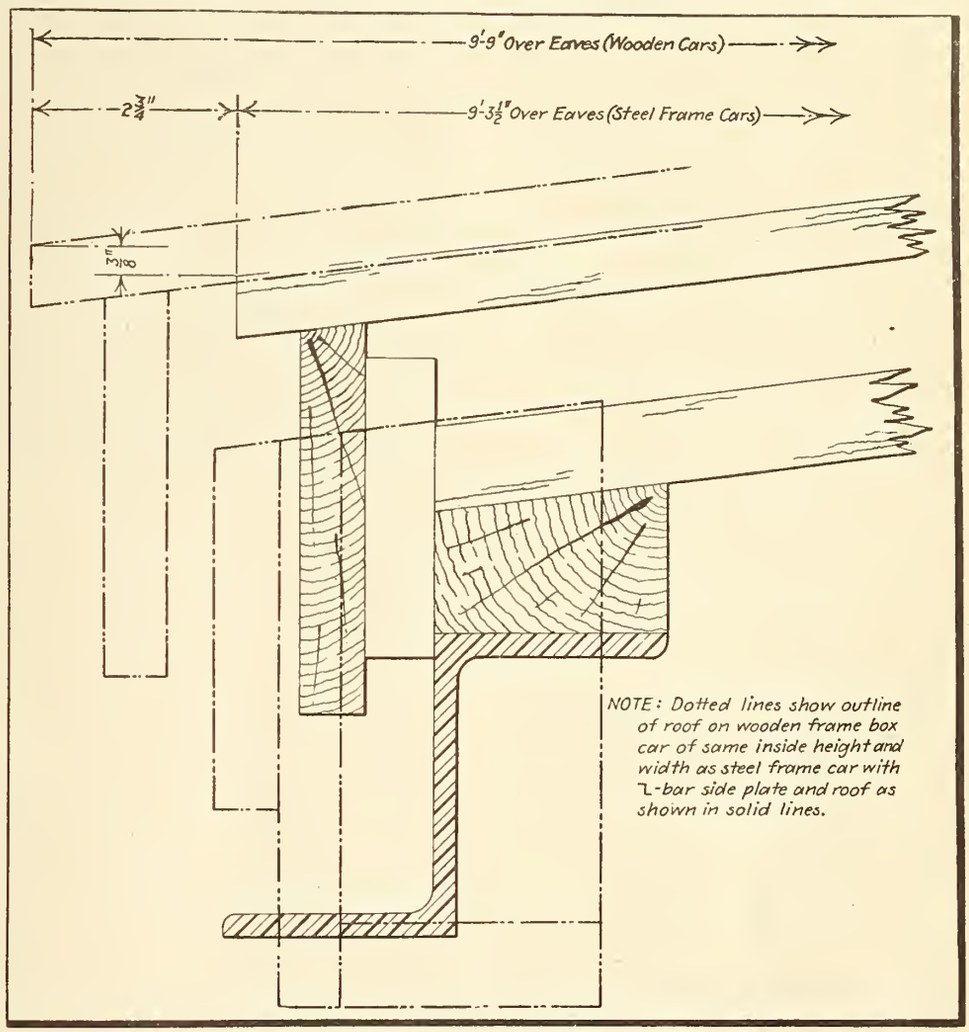
The defects in the sheathing that must be most closely watched are shakes or splits that extend obliquely downward into the car which must be knifed in with paste before the car is painted. The edges of the lining should be painted, and we have found this can be done more easily and thoroughly by dipping the boards and putting them through two rubber scrapers, which removes the surplus paint, leaving the edge thoroughly coated. This gives a thin coat of paint on the inside of the car, which is an advantage in causing the lumber to dry more uniformly and diminishes the tendency to warp. Narrow boards have the advantage of having less tendency to warp, and also if the lumber should not be thoroughly dry, there is less total shrinkage for each board, making the space between the edges narrower. The steel work and roofing are painted the same as other cars. This considerable space has been given to the grading and drying and painting of lumber, as we have found that these factors have required much more attention than everything else combined in connection with the car.

The development of the inside sheathed car has been so rapid and the experience with it so uniformly satisfactory, that I feel safe in saying that its introduction in such large numbers, on so many roads, in so short a time, indicates more nearly a tendency towards the adoption of a standard car than has any distinct type of car, outside of patented cars for special service. It is certain that there will be no backward movement to a wooden superstructure, and that this car, with possible modifications, will remain a standard car unless some superior type is developed. It may be stated as the writer's opinion that no committee will ever develop a car that will be adopted as standard, but that the nearest we will ever get to a standard is what may be developed by one or two persons given a free hand, and the merit of which is so pronounced that it will force itself upon the country.

With the use of structural steel there is less necessity of carrying special parts in stock, on account of repairs being largely a question of labor, and it seems that with this type of car the necessity from a repair standpoint for a standard car is decreasing. This is further borne out by the fact that for the 30,000 cars of this type we have ordered no material for repairs and carry none in stock, outside of material common to all cars, except lining, of which our stock amounts to practically nothing. We save out sufficient of the parts from cars destroyed to make up our stock of repair parts, but have found it necessary to use very little of this. There are, of course, many valid reasons why cars should be made to standard inside dimensions and outside clearances.

To look at the matter in another way, the wheels, axles, journal bearings, journal boxes, couplers, brakes, safety appliances, etc., which constitute the removable and perishable parts, are all standard, and when it is remembered that nearly all of the remaining parts of the cars are standard rolled shapes, which are easily obtained either from the mill or from stock in all principal cities, it is apparent that we now have in effect a standard car, or at least a car of standard parts. A car of different dimensions would not increase the cost of maintenance as long as standard shapes are used; nor would it if every lot of cars is designed differently, as long as proper strength is maintained, and any change in design would usually be to increase the strength. In other words, to keep a car as close as possible to standard and reduce cost of maintenance, rolled shapes should be used in preference to pressed shapes where possible.

It is my belief that the people who are urging the adoption of a standard car, for maintenance reasons, have in mind the remaining wooden cars, for the maintenance of which large quantities of timbers and castings have to be kept in stock. It is of vital importance that the parts be standardized if that style of construction



Details of Roof Clearances on Steel and Wooden Box Cars.

is to be continued. It should not be overlooked that in a car constructed with rolled shapes, these parts seldom need renewal, even when the car is wrecked, as they can easily be straightened or formed to the original shape at any car repair point, while wood would have to be replaced, and pressed shapes would call for special dies to reform them. With a wooden box car the amount of material necessary to carry in stock and use for repairs increases rapidly with the age of the car, with a steel frame box car the amount of material necessary to carry in stock and use for repairs outside of parts common to all cars does not increase with the life of the car.

The wind resistance on the steel frame box cars with inside sheathing is slightly greater than on a smooth outside sheathed car, but on the other hand, it is less than on any ordinary type of stock car. The effect of wind resistance between box and stock cars, has never been great enough to require any distinction between them as to the number of cars that could be hauled in a train of either, and is really a refinement that not even a dynamometer car can detect. A small change in the angle or velocity of the wind, or difference of the number of wheels running to one flange, or trucks somewhat out of square, affects the haulage of the train too much to enable any satisfactory figure for the difference in the wind resistance of the various types of car to be obtained. There is a certain stretch of track on the western plains of about 40 miles, without a curve and practically level, where high winds are frequent, on which the haulage capacity of locomotives is dependent principally upon the wind, and yet even there it was found practically impossible to distinguish between the wind resistance of stock and box cars. From this it is evident that the wind resistance of steel frame inside sheathed box cars, as compared with outside sheathed cars, may properly be ignored.

In the summer of 1911 we lined one of these steel frame cars with corrugated steel and found it to be as simple a matter as lining with wood. We lapped and riveted the sheets, which were no. 13 gauge, between the door and end, and had the corrugations on the side and end coincide, pressing into special corrugated angles in the corners to break the joints. At the floor, we straightened out about 4 in. of the corrugation and formed of it an angle that rests on the side sill, and on this the ends of the floor boards were superimposed, easily making as tight a joint as I have ever seen on any car. After 18 months of general service this car was brought in, and on examination found to be in as good shape as when constructed. It was interesting to note that, when inspected, the paint sealing the joints, where the side sheets lapped, was in no place seal broken, indicating that there is no material weaving or deflection of the sides. The paint was in perfect condition, there still being some gloss, indicating that in the use of steel there is no disadvantage as far as the painting is concerned. Different methods of lining with steel could be followed, and I am convinced that if experience proves that there is no damage to be feared from heat, cold or sweating, that steel lining will be largely used. But, I am also convinced that the use of steel lining with any insulation will never be extensively used, as it adds to the cost and weight without affording any protection to the lading, which is not secured by the wood lining. An advantage of this construction is shown in the application of hoppers under the door openings, which were made without alteration to sills or cross bearers.

As regards the end of the car we use two 4 in. Z-bar end posts of 8.2 lb. per ft., with 1¾ in. lining, which gives good service, but we intend to use on future cars two 5 in. end posts of 11.6 lbs. per ft. with 2⅜ in. lining for a height of 4 ft. and 1¾ in. lining above that height. This, we feel, will protect any lading that needs protection. If a car gets such rough handling that wheels or rails, or similar lading, would break through, it is better to have the boards broken than to distort the posts, as the lining can be replaced at any repair track with a minimum expense, while distorted posts would require sending the car to a steel car repair point. The single thickness end lining makes convenient the application of single thickness, grain tight end doors.

Out of 30,000 of these cars, 29 have been destroyed. Based on the length of time in service, this would average a loss of approximately one car per 1,000 per year. Of the cars destroyed, 15 were burned, 14 were destroyed in wreck, 10 being destroyed on foreign lines. As the loss of cars by fire is in no way affected by the details of construction, I will eliminate these from the calculations. This then, based on the length of time in service would give about one half per car per 1,000 per year destroyed in wreck. As there is no appreciable deterioration of these cars in service, it is safe to assume that in the same service substantially the same rate of loss would continue, while with wooden cars the rate of loss would increase each year.

A conservatice estimate shows that there are today approximately 65,000 steel superstructure cars, including outside sheathed, in service. Of this number 30,000 are C.P.R., and nearly all the remainder belong to the Grand Trunk, Intercolonial, Toronto, Hamilton & Buffalo, Minneapolis, St. Paul and Sault Ste. Marie, Pennsylvania, Rock Island, Erie, Wabash, and Frisco Lines. The Pennsylvania has a 40½ ft. 50 ton car, designed to carry the load on the centre sill; the Frisco Lines has a 40 ft. 40 ton car, designed to carry part of the load on centre sill.

The foregoing paper was read by Mr. Burnett before the American Society of Mechanical Engineers in New York, Dec. 3.

Steel Underframe Box Cars.

At the same meeting G. W. Rink, Mechanical Engineer, Central Rd. of New Jersey, read a paper on steel underframe box cars, of which the following is a brief extract: On account of the large variety of designs of steel underframe box cars, it is the desire to show by tables the practice of the various railways, with a view to selecting such designs as will render the best service, considering the more exact conditions as required by interchange of cars and the use of locomotives of increased tractive power. Box cars should now be built along standard lines, with particular reference to those parts that affect repairs and interchange. Tables showing stresses in underframes for various cars are compiled, certain assumptions having been made in order to treat the subject in general. It is the opinion of the author that a committee representing the various railways throughout the country should be organized, with a view to developing a standard box car which will eliminate cars of inferior design and light construction, thereby facilitating repairs and decreasing operating expenses.

H. G. Smith, City Passenger and Ticket Agent, Grand Trunk Pacific Railway, Vancouver, B.C., in remitting his renewal subscription for Canadian Railway and Marine World writes: "Would be greatly disappointed to miss even one copy."

The Central Railway of Canada and Its Contractors, Etc.

The Quebec Court of Appeal delivered judgment, Nov. 26, in the action of Wills against the Central Ry. of Canada. This was an appeal against the decision of Mr. Justice Archibald in the original action. The Central Ry. Co. of Canada has a charter from the Dominion Parliament to build a railway from Montreal to Midland, Ont., with charters from the Quebec and Ontario Legislatures to build various connecting lines. The company entered into a contract with C. J. Wills and Co., London, Eng., to build the Montreal-Midland line, agreeing on its part to provide funds for carrying on construction. The contractors started work in 1911, but early in 1912 difficulties arose between the company and the contractors. The latter alleged that the company had failed to provide money as agreed, and the former that the contractors were not proceeding with due diligence. As a result the contractors sought to recover damages, and the company took steps to let another contract for construction. The contractors thereupon applied for an injunction restraining the company from proceeding with the work itself or from letting a contract to any other person for building the line. At the original trial judgment was given in favor of the contractors for $2,373.30 on the first claim, with a reservation to claim other damages for breach of the general contract, and an injunction restraining the company from having the line built by any one other than Wills and Co.

The railway company appealed against this decision, and the Court of Appeal found unanimously in favor of the contractors on the first point—the condemnation to pay $2,373.30. On the second point, the reservation to claim other damages, the Court of Appeal found that the trial judge's finding should be amended in such a way as to eliminate the enacting clause embodying the reservation in question. On the third point—the maintenance in full force and effect of the contract—the court found, by four to one, that while the company had failed to provide the necessary funds in conformity with the contract, and consequently was alone to blame for any delay experienced in the carrying on of construction, the company had a right to terminate the contract at any time on paying damages. The opinion of the trial judge was reversed on the point as to the present force of the contract. On the fourth point—the injunction to prevent the company building the line itself, or letting a contract to anyone else—the court, in a lengthened review as to law and practice affecting injunctions, set out a number of reasons why the injunction should be set aside. The decision of the trial judge is therefore upheld so far as to pay the contractors $2,373.30, but is reversed as to all other of its enacting clauses.

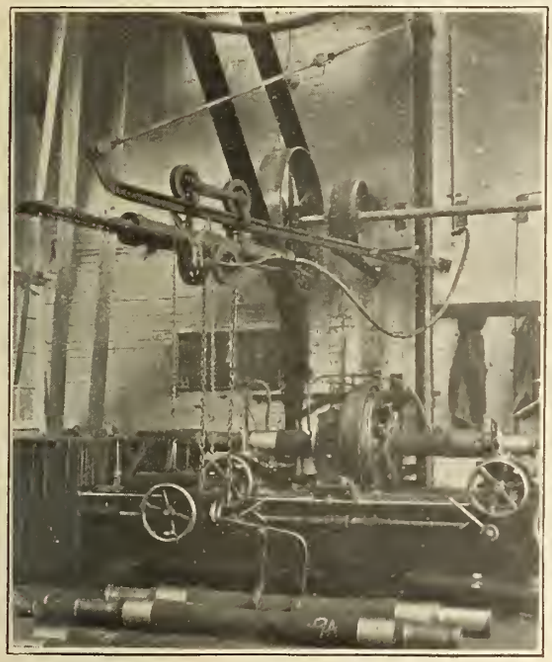
We are officially advised that all construction on this projected line between Montreal and Ottawa has been stopped. F. S. Williamson, Chief Engineer, has resigned, and will act for the company in future as Consulting Engineer.

A meeting of shareholders, under the trust deed of July 17, 1911, made between the company and the City Safe Deposit and Agency Co., London, Eng., was held, Dec. 16, for the purpose of passing resolutions cancelling the trust deed and the redemption of the outstanding bonds.

The Board of Railway Commissioners has established express delivery and collections for Leamington, North Bay, and Sudbury, Ont.

Crane for Mounting Axles in Lathe at West Toronto Shops, Canadian Pacific Railway.

The accompanying illustration shows a handy air crane used in the C.P.R. West Toronto passenger car shops—H. R. Naylor, General Foreman—for lifting axles into the axle lathe for turning. Back of the lathe, against the shop wall, there is attached a jib crane, which has a clear swing over the lathe on the pipe support. On the horizontal arm of the jib there is a two wheel traveller, to the under side of which is attached horizontally an air cylinder. On the under side of the cylinder there are mounted, in bearings, two chain wheels, over which pass hoisting chains, the upper ends attached to a piston rod crosshead. The outward movement of the piston rod, controlled from an air valve adjoining the chain wheels, raises the axle hook on the lower end of the chain, lifting the axle. The axle hook is of the type described some months ago in Canadian Railway and Marine World, as originating in the C.P.R. Angus shops.



Crane for Mounting Axles in Axle Lathe.

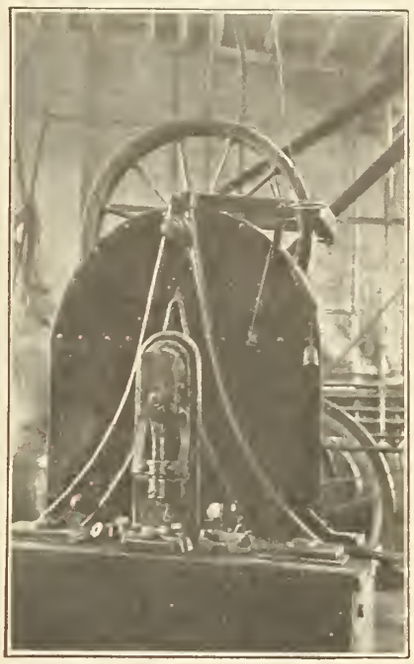
Waste Soaking at Grand Trunk Railway Mimico Locomotive House.

Instead of soaking waste for journals in a pail, or by any of the imperfect methods in common use, the G.T.R. locomotive house at Mimico, near Toronto, is equipped with a simple but efficient device for so doing. This consists of a rectangular steel tank, 26 by 32 ins., and 24 ins. deep, containing about 2 barrels of oil. In this tank, two baskets, about 12 ins. deep, fit loosely, each supported by a chain from a 1¼ in. rod mounted in rough bearings in the side of the tank. The front end of the supporting rod is squared to receive a crank, by means of which the baskets may be lowered into the oil.

The waste to be treated is placed in a basket, after first being torn apart, and the basket load lowered into the oil, where it is allowed to soak at least 5 hours. After this immersion, the basket is raised by the crank and allowed to drain. By this means the waste is thoroughly soaked, and the surplus oil drained off, giving a minimum amount of oil loss. The two baskets are used alternately, one soaking and draining, while the other is in use.

Sheet Punch in Grand Trunk Railway Toronto Shops.

In the G.T.R. Toronto shops—E. Logan, General Foreman—the old Northern Ry. locomotive house is now used for running repairs for the motive power in and out of Toronto. Much of the machinery is more or less antiquated on account of the long time the shop has been in continuous service. Many small machines are to be seen there that have probably no existing counterparts.



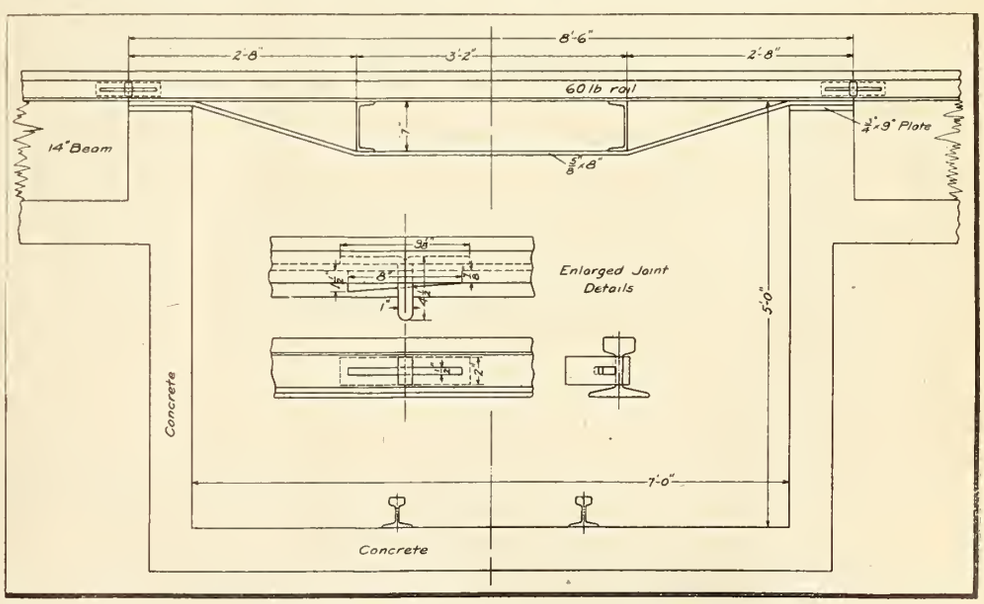
Sheet Punch for Light Work.

The small sheet punch shown in the accompanying illustration is an instance of what has been done to supply small machines to supplement existing equipment. A small punch was required for perforating thin steel sheeting, resulting in the development of this machine. The punch is guided in a forged frame, and to the upper end of the punch there is attached a connecting rod, operated from a crank on the end of a shaft passing through the sheet metal hood behind the punch. Inside this latter is a large gear, mating with a small pinion on the upper shaft, which is driven from above by belting. This shaft carries an old time small fly wheel, made with a cast iron rim and wrought iron spokes.

Drop Pit Rail Clamp at Canadian Northern Ontario Railway Trenton Locomotive House.

The rails bridging the drop pit in the C.N.O.R. locomotive house at Trenton are secured to the approach rails by a novel clamp, as shown in the accompanying illustration. The bridging rail is of a 60 lb. section, 8½ ft. long, over the 7 ft. drop pit, and is trussed by a ⅝ by 8 in. strap on 7 in. channel struts, 3 ft. 2 ins. apart. The ends of the bridging rail, and also of the approach rails, each have a channel, ½ in. deep by 2 ins. wide, cut in the rail web, leaving a 1 by 2 ins. opening when the rails are in position. The clamp comprises a length of ½ by 2 in. bar stock, bent double, and the ends then bent outwards to form a T, the top of which is 9⅛ ins., and the upright, 4½ ins., this latter section being the double thickness of the bar stock. This section just fits in the opening cut in the rail ends. A taper key, ½ in. thick, passes through an opening in the double leg of the T, so that the latter is securely clamped in place when the key is driven after the T is in place between the rails. This locks the rails as efficiently together as when the usual slip fish plate catch is employed.

The top edge of the drop pit wall, on which the rails rest, is surmounted by a metal plate. When the locking member is removed from the rail ends, the rail may be slipped to one side along this bearing plate, far enough to allow of the driving wheels to be lowered to the awaiting pit trucks on the tracks below. This eliminates the laborious work of removing the rail entirely, as is the common practice.



Locomotive House Drop Pit with Novel Rail Clamp.

Economy in the use of fuel may be increased by seeing that locomotives do not have unnecessary delays on the road and are not kept under steam an undue time in the locomotive house. These are just as important considerations as the training of enginemen in the proper handling of the locomotive and in firing.

Divisional Yards on the Montreal-Port Arthur Line, Canadian Northern Ontario Railway.

The Canadian Northern Ontario Railway's Montreal-Port Arthur section of the main C.N.R. transcontinental line, a description of the survey work, etc., on which appeared in Canadian Railway and Marine World for Sept., 1913, has progressed to such a stage that the engineering department has had under preparation for some time plans for the several divisional yards to be completed about the time the line will be opened for through traffic, which, it is expected, will be during this year.

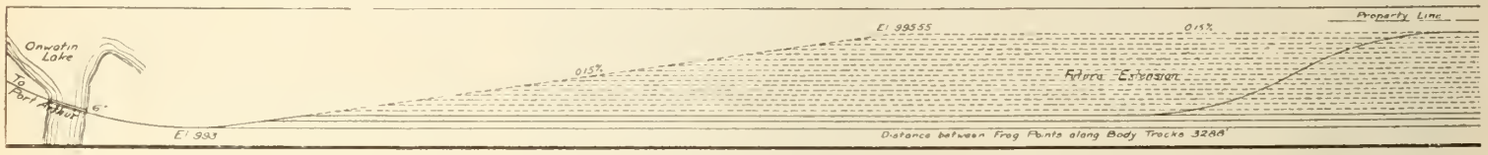
Somewhat longer runs have been provided for than is the practice on the other two principal Canadian lines, the average distance between turning and divisional points being slightly more than 150 miles. This divides the run from Montreal to Port Arthur into very uniform sections, with the exception of the first one from Montreal to Ottawa, which will be only a 116 mile run. The turning and divisional points on the line, with their respective distances from Montreal, will be as follows: Montreal, 0 miles; Rideau (outside Ottawa), 111.6 miles; Capreol, 414.6 miles; Foley (turning point), 563.2 miles; Fitzbach, 711.9 miles; Hector (turning point), 861.7 miles; Port Arthur, 1,010.1 miles. From Rideau to Capreol is 303 miles, and it is the intention to have a divisional point midway, the location of which has not been determined.

In the construction of this link of the new transcontinental line a far sighted policy has been adopted, in so far as is practicable, the designs throughout following the latest practice where such conditions appeared advisable, and wherever it was considered the better policy to follow a cheaper construction, the plans have been so developed as to make possible the introduction of the better construction at some future date with the least change in the original arrangement. In pursuance of this policy, and realizing that the traffic possibilities of this section of the transcontinental line are great, and will increase rapidly, all the turning and divisional points have been laid out in such a manner as to make possible the extension of the yards and facilities to something over four times the initial capacity, utilizing the initial construction as part of the extended yard. In other words, the initial construction is only a portion of the final contemplated accommodation, which may be obtained by making additions to the original arrangement from time to time, without in any way disturbing the general scheme.

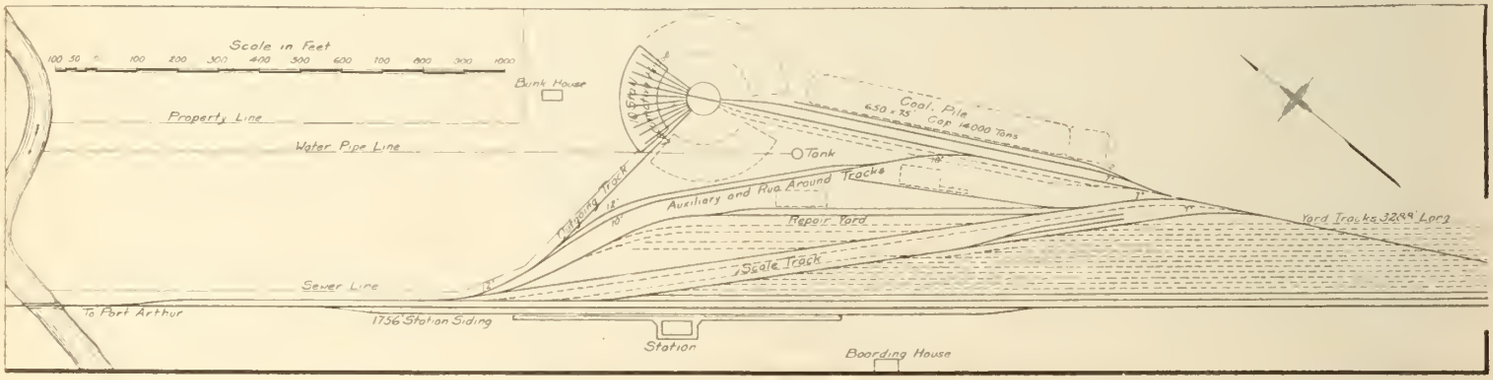
Of the five points under consideration—Rideau, Capreol, Foley, Fitzbach and Hector—two, viz., Rideau and Capreol, are of the greater importance, as both of them are junction points. At Rideau, in addition to the main line, there is also the line from Ottawa to Toronto, now nearly completed, and already operating a freight service, which will make demands on the accommodation, requiring a larger yard and facilities than those at intermediate points. Similarly with Capreol, the junction point of the main line and the Toronto-Sudbury branch, which has a comparatively heavy traffic to the northern mining districts, and it is contemplated that a heavy traffic will develop from the lower Ontario district through this junction point for the west. Of the three other points, Fitzbach is the most important, being a divisional point, and the other two, Foley and Hector, only turning points at the ends of the runs from the divisional points east and west of them.

Of the several divisional and turning points Rideau will not only have the greatest capacity, but will extend over considerably more ground, each of the two lines that branch out from that point having separato yard accommodation, with the mechanical yard arrangement in the intervening angle, as shown in one of the accompanying illustrations. Each of these separate yards will be very similar to the yards at the other points, a standard yard plan having been adopted, with body tracks in all cases 3,288 ft. long. The standard body track length at first accepted in the early studies of yards on this line was 2,800 ft., but this was deemed to be rather too short, as in the latter a maximum train length would be 70 cars, whereas the former gives a possible train length of 80 cars. It is quite conceivable that this will be the standard train length in the near future over this line, as grades and curves have been eliminated as far as practicable, and where such was not possible, provision was made that the line might be reduced to the initially designed high standard at some future time. The maximum gradient will be 0.4%, the limiting gradient for maximum haulage capacity. The far sighted yard policy is thus apparent.

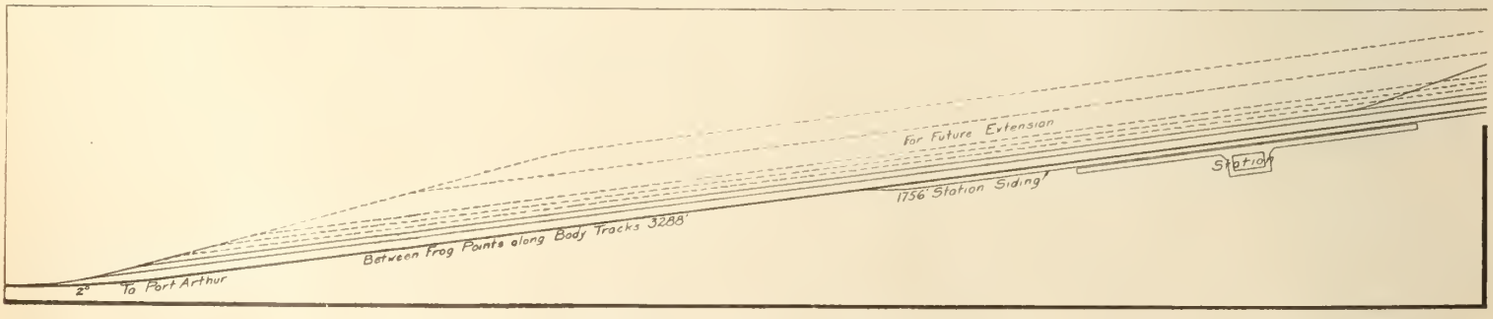
A standard locomotive house construction has been adopted by the engineering and



Canadian Northern Ontario Ry. Yard Layout at Capreol (West End).

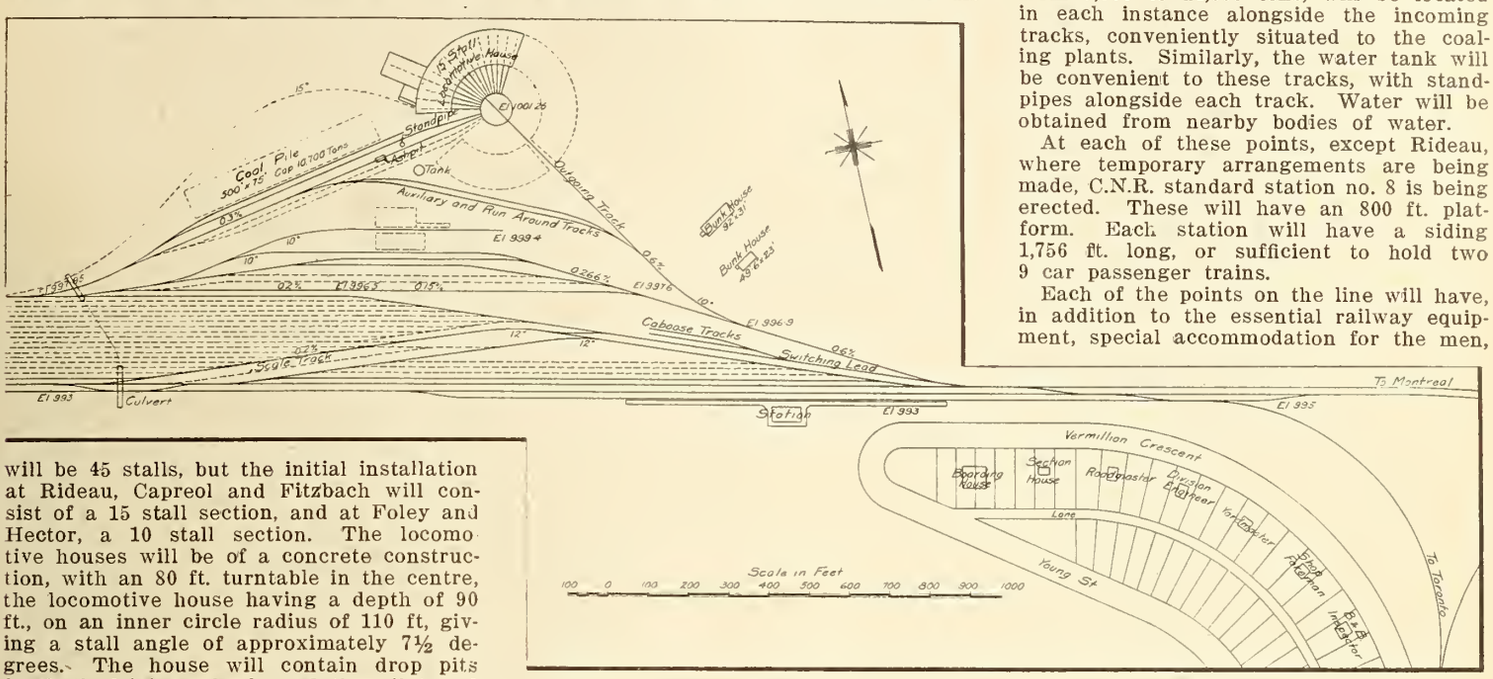


Canadian Northern Ontario Ry. Yard Layout at Foley (West End).

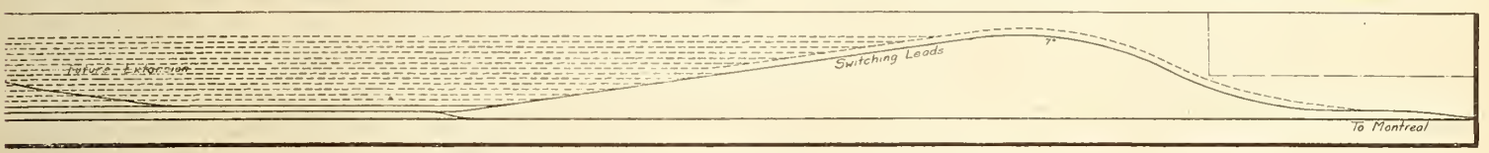


Canadian Northern Ontario Ry. Yard Layout at Fitzbach (West End).

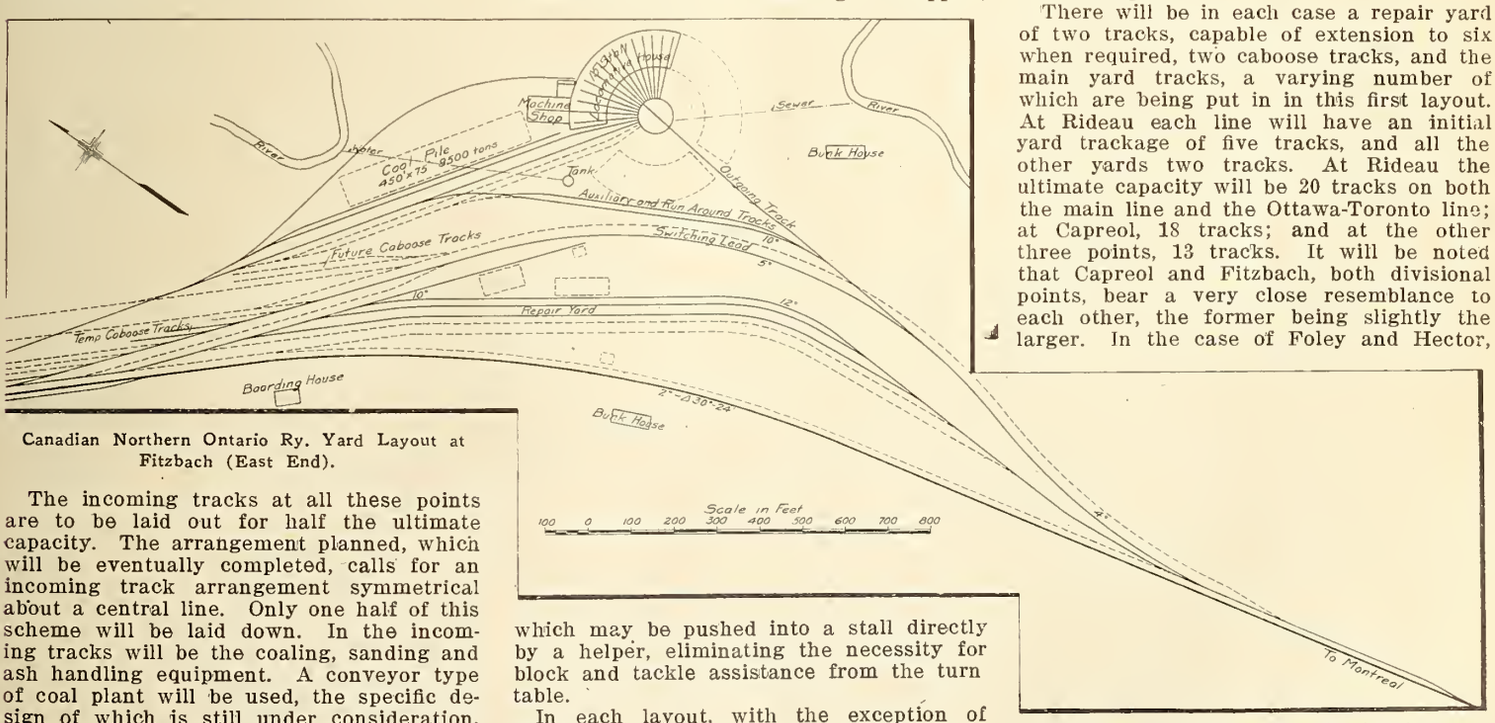
mechanical departments, the same type being built at all the points on the line. The ultimate size of these locomotive houses will be 45 stalls, but the initial installation at Rideau, Capreol and Fitzbach will consist of a 15 stall section, and at Foley and Hector, a 10 stall section. The locomotive houses will be of a concrete construction, with an 80 ft. turntable in the centre, the locomotive house having a depth of 90 ft., on an inner circle radius of 110 ft, giving a stall angle of approximately 7½ degrees. The house will contain drop pits for both driving wheels and the pilot and trailing truck wheels, and will in addition have a small machine shop adjoining for the handling of running repairs, the shops at Rideau and Capreol being larger and more important than at Fitzbach, which in turn is to be more complete than Foley and Hector.



Canadian Northern Ontario Ry. Yard Layout at Capreol (East End).



Canadian Northern Ontario Ry. Yard Layout at Foley (East End).



Canadian Northern Ontario Ry. Yard Layout at Fitzbach (East End).

The incoming tracks at all these points are to be laid out for half the ultimate capacity. The arrangement planned, which will be eventually completed, calls for an incoming track arrangement symmetrical about a central line. Only one half of this scheme will be laid down. In the incoming tracks will be the coaling, sanding and ash handling equipment. A conveyor type of coal plant will be used, the specific design of which is still under consideration, as are most of the details. The ashpits will be air operated.

In all the yards it will be observed that there will be a single outgoing track, with the exception of Rideau with a single outgoing track for each line, and that this track will be tangent for some little distance beyond the locomotive house. In this connection it will be noted that in every instance there is at least one track, either an incoming or outgoing track, that leads directly into a stall. This is an important consideration in the handling of cripples, which may be pushed into a stall directly by a helper, eliminating the necessity for block and tackle assistance from the turn table.

In each layout, with the exception of Rideau, there will be a run around and an auxiliary track connecting the incoming and outgoing tracks. In the excepted instance, these double tracks will connect the two outgoing tracks.

Coal storage piles, varying in capacity from 9,500 to 14,000 tons, will be located in each instance alongside the incoming tracks, conveniently situated to the coaling plants. Similarly, the water tank will be convenient to these tracks, with standpipes alongside each track. Water will be obtained from nearby bodies of water.

At each of these points, except Rideau, where temporary arrangements are being made, C.N.R. standard station no. 8 is being erected. These will have an 800 ft. platform. Each station will have a siding 1,756 ft. long, or sufficient to hold two 9 car passenger trains.

Each of the points on the line will have, in addition to the essential railway equipment, special accommodation for the men, including bunk houses of standard design, dining hall, section house, and at such a point as Capreol, where the divisional staff will be located, a series of cottages. A few company cottages will also be erected at the other points.

There will be in each case a repair yard of two tracks, capable of extension to six when required, two caboose tracks, and the main yard tracks, a varying number of which are being put in in this first layout. At Rideau each line will have an initial yard trackage of five tracks, and all the other yards two tracks. At Rideau the ultimate capacity will be 20 tracks on both the main line and the Ottawa-Toronto line; at Capreol, 18 tracks; and at the other three points, 13 tracks. It will be noted that Capreol and Fitzbach, both divisional points, bear a very close resemblance to each other, the former being slightly the larger. In the case of Foley and Hector, the turning points, the similarity is more apparent, the layouts being almost identical.

The engineers were most fortunate in nearly every instance in choosing sites that

are practically level, requiring but a small amount of excavation and fill. The principal exception was Capreol, where some heavy cutting was made necessary. Foley was also comparatively heavy, and Fitzbach had some filling. Both Hector and Rideau, however, were practically level.

The several yards were planned in the office of H. E. B. Smith, Engineer of Yards and Terminals, Toronto, from whom the data on which this article is based, was secured, through the courtesy of A. F. Stewart, Chief Engineer. We are also indebted to J. Montgomery, of the Imperial Construction Co., for information concerning the standard buildings which are being erected by that company at these points.

Automatic Electric Block Signalling on the Canadian Pacific Railway.

In addition to the block signalling work referred to in previous issues, automatic block signals are being installed between Montreal Jct. and Iberville Jct., Que., 27 miles; between West Toronto and Islington, Ont., 5 miles; between Markstay and Stinson, Ont., 11 miles; for 3 miles at Mattawa, Ont., and between Renfrew and Eganville, Ont., 6 miles. For the 13 miles between Islington and Streetsville Jct., Ont., they have been rearranged for the new second track.

The block signal system in operation between Fort William, Ont., and Winnipeg is similar to that in use on the Eastern Lines except that the signals protect station limits only. The signals, which are of semaphoro type, are located about 3,000 ft. outside of the outlying switch, and, in accordance with usual C.P.R. practice, the semaphore stands at horizontal for "stop" and 90 degrees above horizontal for "clear." They are electrically operated, and act in such a way that a car or engine occupying the main track at any point from the signal through the station yard will hold the signal at "stop," and also if a switch in the main line should be open or a car happen to stand on siding close enough to the switch to foul the main line or there should happen to be a broken rail in the portion of track protected by the signal, the signal will stand automatically at "stop"—furthermore, the mechanism is so designed that in the event of a possible failure of the electric current or in the mechanism itself the signal will stand at "stop."

A. L. Smith, Superintendent District 1, Lake Superior Division, Sudbury, Ont., has issued the following special rules:—

The movement of trains between Markstay and Stinson, and at Mattawa, will be controlled by normal danger automatic block signals of the three position, upper quadrant type, the three positions being: horizontal, forty five degrees above horizontal, and ninety degrees above horizontal. The indications given are:—Arm horizontal—Stop. When in this position a red light is displayed at night. Arm forty five degrees above horizontal—Proceed, prepared to stop at next signal. When in this position a yellow light is displayed at night. Arm ninety degrees above horizontal—Proceed. When in this position a green light is displayed at night.

The signals governing eastbound trains have even numbers, and those governing westbound trains have odd numbers, and are on poles, located at the entrance to each block on the right hand side as seen from an approaching train. The arm of a signal has a pointed end. A lunar white marker light is placed at 6 ft. below, and on the opposite side of pole from signal light.

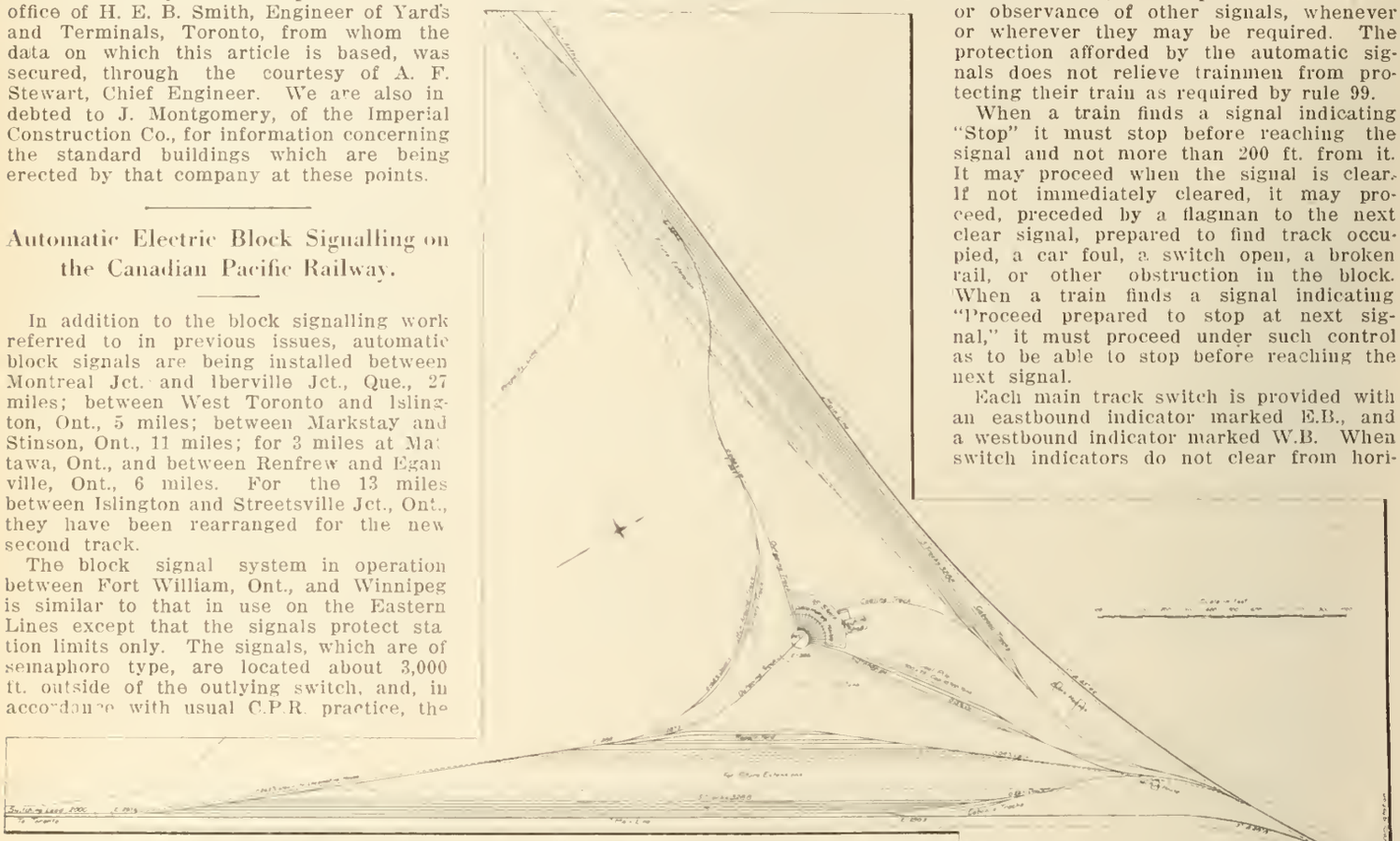
The track is divided into blocks, and the block signals control the use of the block but do not effect movement of train under the train rules, nor dispense with the use or observance of other signals, whenever or wherever they may be required. The protection afforded by the automatic signals does not relieve trainmen from protecting their train as required by rule 99.

When a train finds a signal indicating "Stop" it must stop before reaching the signal and not more than 200 ft. from it. It may proceed when the signal is clear. If not immediately cleared, it may proceed, preceded by a flagman to the next clear signal, prepared to find track occupied, a car foul, a switch open, a broken rail, or other obstruction in the block. When a train finds a signal indicating "Proceed prepared to stop at next signal," it must proceed under such control as to be able to stop before reaching the next signal.

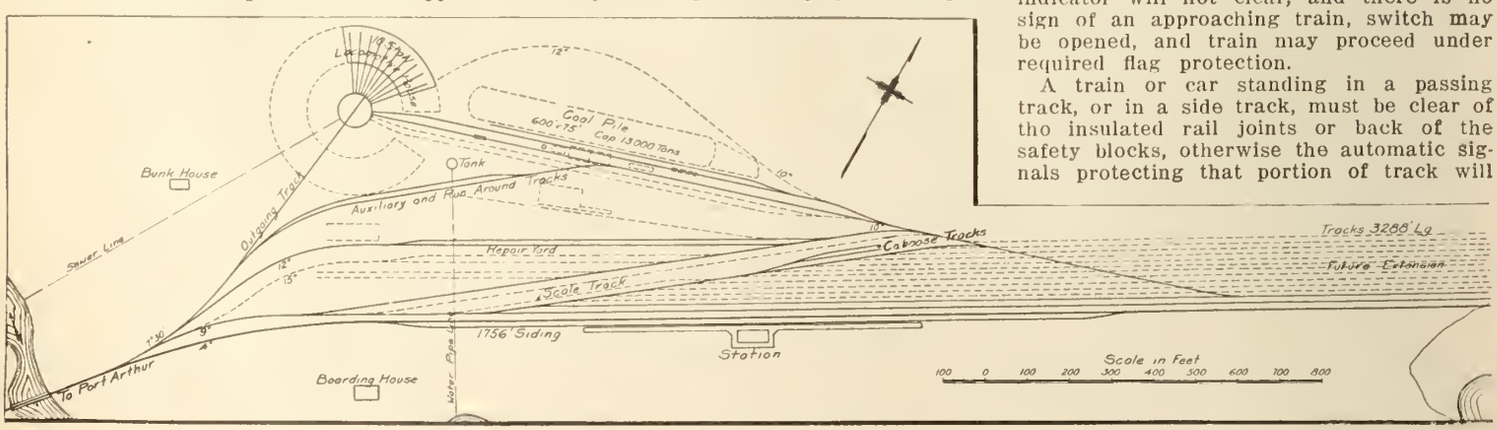
Each main track switch is provided with an eastbound indicator marked E.B., and a westbound indicator marked W.B. When switch indicators do not clear from horizontal to vertical by operating the push button underneath the indicator, it will indicate that a train is approaching and switch must not be opened until sufficient time has elapsed to allow the approaching train to pass. If, after this period of time, indicator will not clear, and there is no sign of an approaching train, switch may be opened, and train may proceed under required flag protection.

A train or car standing in a passing track, or in a side track, must be clear of the insulated rail joints or back of the safety blocks, otherwise the automatic signals protecting that portion of track will not clear for an approaching train.

Conductors must report by wire to the Superintendent from the first telegraph station all delays caused by signals, giving the number of signal, and cause if known. Engineers must use forms S. M. 1 to report delays at signals, except delays on account of train ahead. Track foreman and other employes will also report promptly by wire



Canadian Northern Ontario Ry. Yard Layout at Rideau (Ottawa). See pages 6 and 7.



Canadian Northern Ontario Ry. Yard Layout at Hector (West End). See pages 6 and 7.

any defect noticed in the signals, wires, or other appurtenances of this system.

Trainmen must not make any change in the track which will interfere with the signal system without notifying the signal maintainer, and, except in case of emergency, receiving his consent.

Signals 546 and 631, being the end signals of the installation between Markstay and Stinson, and signals 725 and 720, being the end signals of the installation at Mattawa, will operate only in two positions, namely, horizontal, and 45 degrees above horizontal.

If necessary to clean the ashpan on the main track, inside of block signals limits, the ashes and cinders must immediately be removed by the fireman, if no one else is available for the purpose, in order to prevent damage by fire to the trunking which covers the signal wires.

The Canadian Pacific Railway's Windsor Street Station, Montreal.

The extensive additions to the Windsor St. station, Montreal, are rapidly approaching completion. A full description, with plan, of the trackage and approaches appeared in Canadian Railway and Marine World for November, and a very complete article on the power interlocking and signalling appears elsewhere in this issue.

In the summer of 1910 the foundations were laid of an addition to the old building, to extend the frontage along Windsor street to a total of over 490 ft. with a frontage on St. Antoine street of over 170 ft. There were two problems to be faced, one architectural, the other engineering. The architect's difficulty was to devise a facade which would look harmonious and impressive from every point of view, in spite of the fact that there was a difference in elevation on Windsor St. of 40 ft. between St. Antoine and Osborne streets. The engineering problem was to find a satisfactory foundation on rather treacherous soil for the massive tower, which the architect proposed. The sinking of the foundations delayed the work considerably at the initial stages, but eventually a satisfactory base was found, and the building began to rise with a structural steel frame, all the columns of which rest upon heavy concrete foundations carried to rock by means of cylindrical caissons. The variation in levels had one satisfactory result, namely, that room was found for vast vaults beneath the main floor of the building and beneath the tracks, in which there is storage capacity sufficient to accommodate records for many years to come. These vaults cover a ground area of 66,000 sq. ft., still leaving room for an immigration hall covering 10,000 sq. ft., Chinese waiting room, covering 6,900 sq. ft., and third class passenger waiting room, covering 3,000 sq. ft. with a combined capacity of 30,000 gallons, and is said to be the most massive tower in Canada. The general waiting room, in the main building, has a ground area of 7,800 ft. The new addition alone contains 2,800 tons of steel, apart from the steel used in the train sheds. The building when completed will have 13 elevators, 8 for passengers (2 of which have a lifting capacity each of 7,000 lbs.), 4 for freight and baggage, and 1 for the kitchen and restaurant.

In the construction of the exterior of the building limestone from quarries in the Province of Quebec was used, and the labor employed was almost entirely native. The steel was manufactured at Lachine by the Dominion Bridge Co. As many as 600 men were employed at one time on construction, the rivetters and erectors being chiefly recruited from the Indian reservation at Caughnawaga. The stonemasons were French Canadians. The interior fittings were very fine, marble being used exclusively in the principal halls and corridors. Italy, France, Indiana and Tennessee have each contributed from their quarries, some of the stone coming from Euville, and some of the marble from the Botticino quarries.

The trainsheds have been planned to cover all the tracks, which have been increased to 11 in number. On 6 tracks the sheds are 1,000 ft. long, on 2 tracks 800 ft., on 2 more 550 ft., and on track 1, intended particularly for suburban traffic, 420 ft. Over 2,000 tons of steel have been used in these sheds, exclusive of the concourse. The area covered is 205,000 sq. ft., or about 5 acres. The train sheds are of the Bush pattern, and special care has been taken to provide roof drainage and to ensure dry and clean platforms at all times. The skylights are designed so as to be always clear, and snow can be shovelled through slots in the roof on to cars below. A copper hood over every skylight is specially designed to allow of ventilation and yet to prevent snow or rain from drifting in. There is a system of fire protection in case of cars taking fire in the station, pipes being laid with plentiful supply of water under high pressure.

The cubic capacity of the new portion of the building, exclusive of vaults under tracks, but including the splendid concourse, is 4,703,000 cu. ft., while the viaducts total another 1,000,000 cu. ft., and the power houses an additional 220,500 ft. The tower is 15 stories high, or 16 including the basement, and its top is 225 ft. above the level of St. Antoine St. It contains water tanks,

Birthdays of Transportation Men in January.

Many happy returns of the day to:—

W. U. Appleton, General Master Mechanic, Intercolonial Ry., Moncton, N.B., born there, Jan. 29, 1878.

R. Armstrong, Superintendent, District 4, Manitoba Division, C.P.R., Souris, born at Kingston, Ont., Jan. 27, 1865.

F. X. Belanger, General Freight and Passenger Agent, Temiscouata Ry., Riviere du Loup, Que., born at Chlorydormes, Que., Jan. 20, 1876.

R. H. Bell, General Agent, Canadian Northern Ry., Chicago, Ill., born at Toronto, Jan. 13, 1865.

G. McL. Brown, European Manager, C.P.R., London, Eng., born at Hamilton, Ont., Jan. 20, 1866.

W. H. Burr, Traffic Manager, Dominion and Western Express Co.'s, Toronto, born at Bloomington, Ill., Jan. 19, 1864.

W. A. Cowan, acting Superintendent, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., born at Galt, Ont., Jan. 22, 1877.

J. E. Dalrymple, Vice President, G.T.R., G.T.P.R., and Central Vermont Ry., Montreal, born there, Jan. 1, 1869.

A. Davidson, General Agent, G.T.R., Prince Rupert, B.C., born at St. Henri, Montreal, Jan. 29, 1885.

J. E. Everell, Superintendent, Montmorency Division, Quebec Ry., Light and Power Co., Quebec, born at Cap Rouge, Que., Jan. 1, 1863.

Sir Sandford Fleming, K.C.M.G., director, C.P.R., born at Kirkcaldy, Scotland, Jan. 7, 1827.

W. H. Gougeon, Locomotive Foreman, C.P.R., Webbwood, Ont., born at Point Alexander, Ont., Jan. 16, 1872.

Gordon Grant, Chief Engineer, National Transcontinental Ry., Ottawa, born at Dufftown, Scotland, Jan. 2, 1861.

H. J. Herrold, General Freight and Passenger Agent, Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Athens, Ohio, Jan. 21, 1880.

G. F. Hichborn, formerly Agent, Great Eastern Fast Freight Line, New York, born at Boston, Mass., Jan. 13, 1875.

Carl Howe, Manager, New York Central Fast Freight Lines, Chicago, Ill., born at Berrien Springs, Mich., Jan. 11, 1870.

W. C. Hunter, ex-Manager, New Brunswick Coal and Ry. Co., Moncton, N.B., born at St. John, N.B., Jan. 4, 1865.

H. G. Kelley, Vice President, G.T.R., Montreal, born at Philadelphia, Pa., Jan. 12, 1858.

James Kent, Manager, C.P.R. Telegraphs, Montreal, born Jan. 15, 1854.

A. J. McGee, Secretary-Treasurer, Timiskaming and Northern Ontario Ry., Toronto, born at Lachine, Que., Jan. 24, 1876.

G. C. Martin, General Freight and Passenger Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., born at Creemore, Ont., Jan. 2 1866.

G. Pepall, Assistant Division Freight Agent, G.T.R., and Agent, National Despatch-Great Eastern Line, Toronto, born at High Wycombe, Bucks, Eng., Jan. 15, 1849.

W. Phillips, European Traffic Manager, Canadian Northern Ry. and Canadian Northern Steamships, Ltd., London, Eng., born in Toronto, Jan. 31, 1870.

W. Pratt, Superintendent, Sleeping and Dining Cars and Hotels, Canadian Northern Ry., Winnipeg, born at Sibbertoft, Northamptonshire, Eng., Jan. 18, 1870.

John Pullen, President, Canadian Express Co., Montreal, born at Shepton Mallet, Eng., Jan. 23, 1863.

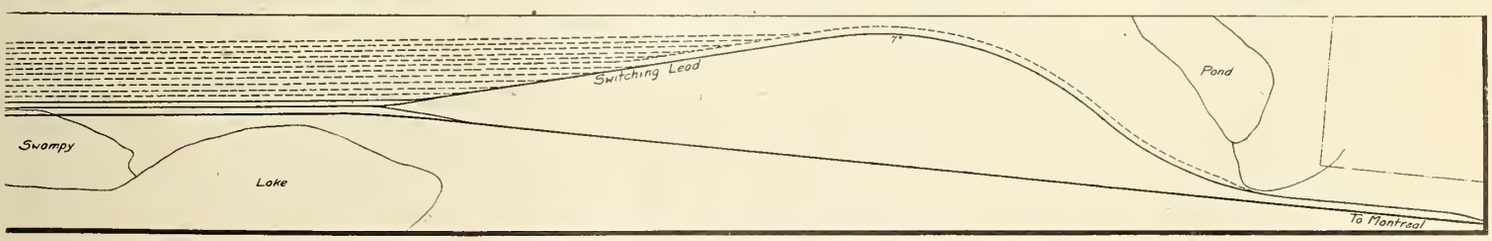
L. J. Rouleau, Travelling Freight Agent, G.T.R., and Agent, National Despatch-Great Eastern Line, Montreal, born there, Jan. 6, 1879.

B. G. F. Rutley, ticket agent, C.N.R. and G.T.P.R., Fort Garry Union Station, Winnipeg, born at Chatham, Ont., Jan. 25, 1879.

S. J. Shannon, Comptroller and Treasurer, Intercolonial Ry., Moncton, N.B., born at Halifax, N.S., Jan. 18, 1865.

J. G. Sullivan, Chief Engineer, C.P.R. Western Lines, Winnipeg, born at Bushnell's Basin, N.Y., Jan. 11, 1863.

Ross Thompson, Chief Engineer, St. John



Canadian Northern Ontario Ry. Yard Layout at Hector (East End). See pages 6 and 7.

and Quebec Ry., Fredericton, N.B., born at Newry, Ireland, Jan. 1, 1865.

J. A. Villeneuve, ex-Comptroller and Treasurer, Richelieu and Ontario Navigation Co., Montreal, born there, Jan. 4, 1864.

O. C. Walker, Inspector, Refrigerator Service, C.P.R. Western Lines, Winnipeg, born at Newport, Mon., Eng., Jan. 31, 1877.

F. J. Watson, Assistant General Freight Agent, G.T.R., Montreal, born at Toronto, Jan. 12, 1866.

G. H. Webster, M. Can. Soc. C.E., Vancouver, B.C., born at Creemore, Ont., Jan. 31, 1858.

T. H. White, Chief Engineer, Canadian Northern Pacific Ry., Vancouver, born at St. Thomas, Ont., Jan. 27, 1848.

A. Wilcox, General Superintendent, Central Division, C.N.R., Winnipeg, born at Kincardine, Ont., Jan. 2, 1865.

T. A. Wilson, Assistant Superintendent, District 3, Lake Superior Division, C.P.R., Schreiber, Ont., born at Stratford, Ont., Jan. 27, 1872.

The Manufacture of Coil Springs.

There are a number of parts that enter into the construction of all kinds of rolling stock which can be made in conventional and slow methods in the railway shops, but which when made in the specialty shops of large supply companies, are made more expeditiously and, for the most part, better, from the fact that the demand is sufficiently great to warrant the installation of special machinery for this purpose. Such an instance is the production of coiled springs, which are in use in large quantities in every railway shop. Their production under the usual blacksmith shop methods would be an uneconomical practice; in specialty shops, this is not the case.

Fig. 1.—Coil Winding Machine

The development of a coiled spring is a most interesting process, and from its very general service, and the fact that but few people know the steps through which the stock passes in the development, the following description has been prepared. The practice followed in the Canadian Steel Foundries spring shop at Montreal has been selected as an example of modern practice in this work.

To obtain a flat bearing on the ends of the coil spring, the ends of the bar stock from which the coil is developed is drawn out to a flat tapered end, something like a chisel. The spring steel that is made up into these coils is received from the rolling mills, cut to length, with the ends of the stock pieces drawn down as explained. The initial step in the coil shop is thus the coiling of the spring. Piles of the spring stock lengths are to be seen in the background in the accompanying illustrations.

Figs 1 and 2 show the mechanism of the machine, which completes the whole operation of winding the coil in very short order. Oil furnaces for heating the stock are located to the rear of the point from which the views were taken. Here the lengths are heated in batches as for the bolt machine, etc.

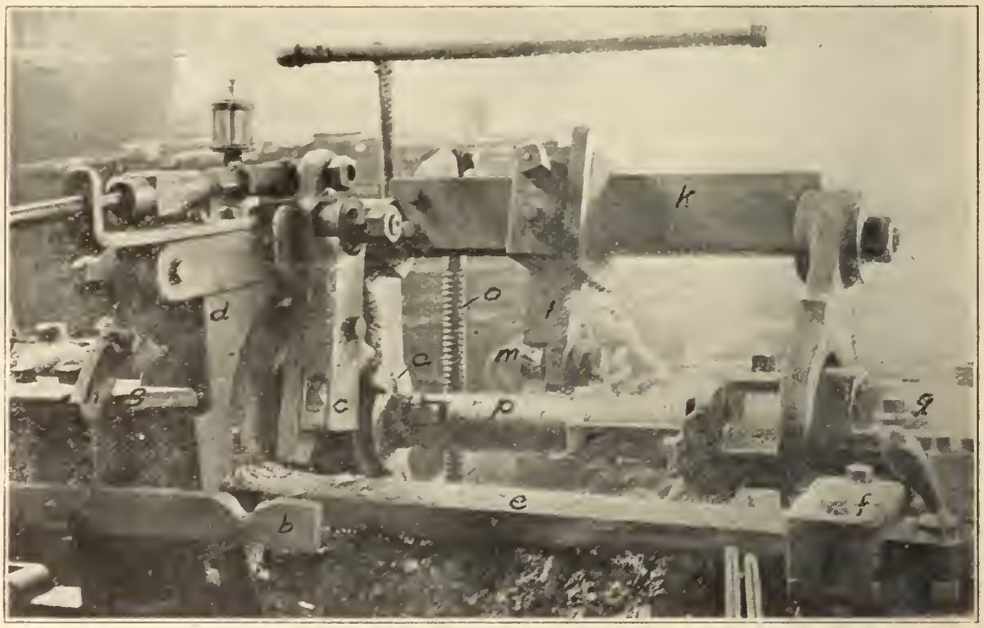


Fig. 2.—Close View of Coil Machine.

The construction of the machine is fundamentally that of the lathe. A spindle is carried in two bearings which are integral with the base of the machine. The front bearing of these two is located behind the mechanism to the left in fig. 2. The spindle at this point is large, and on its front is attached the stock chucking device a. This consists of a short knife edge mounted on the inner face of an arm that parallels the spindle inside the front bearing, and which is fulcrumed on the spindle inside the bearing, the whole revolving with the spindle. To the rear end of this fulcrumed arm is ring on a sleeve that can be moved within short limits on the spindle behind the front bearing. The movement of the sleeve by an operator's handle pushes the short link into a vertical position under the rear of the fulcrumed lever, the knife edged front end of this latter being depressed on the end of the bar stock, the end of which is pushed in under the knife edge, with the flat against the shoulder of the spindle at the point a. The central arbor on which the bar stock is clamped by the knife edge is the internal diameter of the spring. The knife edge is so adjusted as to bear down tightly on the stock when the locking sleeve to the rear is moved into the locking position.

On the face of the spindle shoulder at a, there is a slight projection against which the stock bar is forced before clamping. The bar is guided into place over the support bar b, and through the pitch guide, c, the purpose of the latter being to guide the bar while the spindle is winding up the stock so as to give the desired pitch. The pitch guide bar, c, is carried on a carriage which corresponds to the carriage of a lathe. This carriage is the casting d, which is bolted to a guide, e, which slides in bearings, one of which is shown at f.

On the face of the stationary part of the machine is a tapered bar, g, on which a short arm, h, fulcrumed on the carriage, rests when the carriage is in its furthest back position. Through an adjustable link connected to the upper end of the arm h, the latter is connected with the upper end of the guide arm c, so that when the arm h rides down the taper of g the arm c falls in towards the coil arbor, resting against the outer surface of the coil, against which it is held by the small coiled spring on the link on the top of the carriage. The bar stock is thus accurately guided on the arbor.

The forward movement of the carriage is obtained through a pitch screw sleeve secured to the machine spindle between the two bearings, as at i. These pitch screw sleeves are made in all the desired sizes,

and are constructed in halves which can be bolted on around the spindle. The sleeves consist of hollow cast iron shells, in halves, as mentioned, bored at the ends to fit the spindle, with the outer surface turned, and grooved with a narrow channel cut to the required pitch, each end of the pitch groove breaking away from the spiral to give the flat end to the spring. On the continuation of the bar e to the left, there is a vertically hinged arm, on the lower face of which there is a pin that can be dropped into the grooves of the pitch sleeve. This arm, j, fig. 1, is shown dropped into the pitch sleeve by the operator to the rear. This arm being attached to the bar e, carries the carriage to the right with the pitch of the screw, feeding the coil along over the arbor. On reaching the full length of the spring, the pin in the pitch sleeve groove rises out of the groove, when the carriage is ready to return to its initial position.

Over top of the winding arbor, there is a bar, k, pinned at each end, and which carries a downwardly projecting arm, l, with a stencil wheel pinned on its lower end. This stencil is engraved with the initials of the company and the number of the month of the year. The arm l is so set on the bar k for each size of spring that the last coil of the spring bears up under the roller, the name and date being automatically rolled on the spring during the winding operation. On the completion of the spring winding, the stencil roller is swung out of the way by the depression of a lever at the floor level, connected to the lower end of the rod o.

The arbor on which the coil is wound is of the expanding mandrel type, with the shell of the arbor in three sections, and an internal taper pin that forces outward these three sections to the required diameter. The inner taper pin of the arbor is operated through the lever in the hands of the operator on the right in fig. 1, this lever being fulcrumed on the arbor carrying frame, with the inner end connected to the taper pin, which, on being forced to the left, expands the arbor.

The frame that carries the expanding winding arbor is a carriage sliding on ways in the lower part of the frame of the machine, the action being such that the carriage can move away to the right from the position shown in both illustrations, so that the winding arbor is free from the supporting point where it connects with the chuck. The connection is only a loose sliding joint. This carriage, on moving to the right, causes the spring to strike the arm r. Before moving backwards, the taper pin in the centre of the mandrel is loosened, freeing the spring on the mandrel, so that as the spring strikes the stationary bracket r, it is slipped off the mandrel.

The drive of the machine is through a clutch block, engaging the gearing on the left in fig. 1 with the machine spindle. This clutch is operated by the attendant to the rear. On the lower left hand side will be noted a short shaft. This connects at the near end with a cross shaft through bevel gears, this latter shaft bearing at its centre a pinion meshing with a gear rack on the under side of the arbor carrying carriage. Through this means, the carriage can be moved to the right so as to draw the arbor from out of the coiled spring.

Over the top of the machine will be noted a short length of pipe, the lower surface of which is perforated with a series of small holes, through which water is poured on the winding arbor, keeping the parts cool. The spring, on being dropped off the arbor, runs down a chute under the arbor to the floor to the rear.

The still red hot spring is next immersed in an oil bath and tempered in the conventional manner. After this process in the oil bath, the spring is taken to a testing machine, in which it is forced up tight once, to give the required initial set. This testing press consists of a 4 bar vertical frame. On the upper end of the rod frame is a heavy head, on the under side of which is a set of 6 springs carrying on their lower end a face plate, the idea of the spring backing being that the machine will not be strained on tightening down the coil. Guided on the lower parts of the four rods is a plunger, operated from below through a chain of gears to a connecting rod, giving the plunger table a slow vertical motion. The spring is placed on the table, the upward movement carrying it up to the spring cushioned head, against which it is tightened up. This gives the spring the required set, providing the tempering has been correct. To test for this set, there are gauge arms attached to one of the four legs. The spring is slipped into these legs, and if the tempering is correct, the spring will just clear through. This is the final step in the spring production. On ordinary heavy springs, it is possible to produce as many as 75 an hour in this machine without undue exertion, so that the development of the machine is a considerable improvement on older methods of forming by hand.

Additions to Grand Trunk Railway Freight Car Equipment.

The G.T.R. has added to its rolling stock recently a large number of freight cars of improved designs, comprising several thousand all steel hopper cars, 2,000 steel frame box cars and 250 steel underframe automobile cars.

The hopper cars are specially adapted to the transportation of coal and coke, being self clearing and having doors which are easily and quickly opened or closed by means of a device which is positive in action as well as safe against accidental discharge of lading. They were designed to carry 100,000 lbs. of coal with an addition of the usual 10% overload. Pressed shapes, plates and structural material have been used to the best advantage to obtain as light a car as possible, consistent with good practice, for the service required. The centre sills, which extend from end sill to end sill, are made of 10 in. 20 lb. channels, reinforced at top with cover plates, and at bottom with 3½ by 3½ in. angles. The side sills extend from bolster to end, and are made of pressed steel 10 in. deep; 10 in. 15 lb. channels are used for end sills and are attached to side sills by means of gussets and malleable iron push pockets.

The body bolster consists of a ¼ in. web plate, reinforced at top with a bent plate, and at bottom with 3½ by 3 in. angles, and an 18 by ⅜ in. tie plate, the centre plate and brace being made of malleable iron. The corners of the car are further stiffened by means of diagonal braces made of 5 by 3 in. angles, extending from body bolster at centre to end sills at corner of car. The side, end and floor sheets are made of ¼ in. plates, reinforced with flanges and angles, the sides being stiffened vertically by 7 pressed steel stakes per side, two inside gussets at cross ridge and two channel braces extending across car near the top from side sheet to side sheet. There are four doors, hung in pairs, each two doors being connected by two 5 in. channels, placed back to back, to which the operating arm of the door gear is connected. The operating device consists of levers and cams and is positive in action, and when in the closed position the doors cannot be accidentally opened and lading discharged along the tracks. The trucks are of the arch bar type with rolled channel top arch bar, 5½ ft. wheel base, 5½ by 10 in. journals; pressed steel truck bolster and brake beams; malleable iron journal boxes and grey iron wheels being used. All safety appliances are in accordance with the requirements of the Board of Railway Commissioners and the Interstate Commerce Commission, to permit use of cars in service between Canada and the U.S. The general dimensions are as follows:—

Length inside of body	30 ft. 0 ins.
Width inside of body	9 ft. 6 ins.
Width over side stakes	10 ft. 1½ ins.
Length over end sills	31 ft. 6 ins.
Height from rail to top of body	10 ft. 0 ins.
Height from rail to top of brake mast	10 ft. 9 ins.
Length of drop doors in clear	2 ft. 4¾ ins.
Width of drop doors in clear	3 ft. 4½ ins.
Weight of car body	20,600 lbs.
Weight of two trucks	16,400 lbs.
Light weight of car	37,000 lbs.
Percentage of paying load to total weight of car and lading	75%

BOX CARS.—The 2,000 steel frame box cars, 60,000 lbs. capacity, which were recently completed, have steel under and upper frames and carlines, with wooden floor, roof and sheathing. The centre sills are 15 in. 33 lb. channels, and the side sills 8 in. 11¼ lb. channels, all extending from end sill to end sill. The end sills are 10 in. 15 lb. channels, connected to side sills by gusset plates and pressed steel push pockets. The body bolsters are built integral with underframes and are made of four pressed steel diaphragms and one cast centre brace each, reinforced at top and bottom with 15 by ⅜ in. cover plates. The underframe is further strengthened, transversely, by two cross bearers made of pressed steel diaphragms, with top and bottom cover plates, 13 in. deep at centre sills and 7 in. deep at side sills, also by three shallow diaphragms made of 5 in. to 6½ in. channels. The side posts and braces are made of 3 in. 6.7 lb. Z bars and the end posts of 4 in. 8.2 lb. Zs, securely riveted to the side and end sills and plates. The floor boards are made of yellow pine 1¾ in. thick, resting directly on side sills and bolted to intermediate Z bar stringers, being supported at centre by yellow pine stringers resting on top of centre sills. The side sheathing, or lining, is made of yellow pine 1½ in. thick, bolted to Z bar posts and braces with ½ in. bolts; the end lining being made of 1¾ in. yellow pine, bolted to end and corner posts. There are two centre side doors, one on each side of car, made of yellow pine. The cars are equipped with Westinghouse air brakes, cast steel couplers, vertical twin spring draft gear with key attachment to couplers, roller side bearings, inside metal roof and all safety appliances in accordance with the requirements. The trucks are of the arch bar type with 4¼ by 8 in. journals and 5 ft. 2 in. base, equipped with pressed steel bolsters, cast steel centre plates, M.C.B. brake beams, steel back shoes, malleable iron boxes and 625 lb. grey iron wheels. The general dimensions are as follows:—

Length inside of car	36 ft. 0 ins.
Width inside of car	8 ft. 6½ ins.
Height from floor to carlines	8 ft. 0½ ins.
Width of door opening	6 ft. 0 ins.
Height of door opening	7 ft. 7¾ ins.
Length over end sills	37 ft. 4¾ ins.
Width over side sills	8 ft. 9½ ins.
Width over eaves	9 ft. 3⅜ ins.
Height from rail to top of floor	4 ft. 2¼ ins.
Height from rail to roof at eaves	12 ft. 7¾ ins.
Height from rail to top of running boards	13 ft. 5 ins.
Height from rail to top of brake mast	13 ft. 11¼ ins.
Weight of car body	23,000 lbs.
Weight of two trucks	12,300 lbs.
Total light weight of car	35,300 lbs.

AUTOMOBILE CARS.—The 60,000 lbs. capacity automobile cars are of the following dimensions:—

Length over striking plate	41 ft. 8 ins.
Length over running boards	42 ft. 0 1-8 ins.

Length inside	40 ft 0 ins.
Height from floor to carline	8 ft. 6 ins.
Height from top of rail to top of floor	3 ft. 8 ins.
Height from top of rail to eaves	12 ft. 8 9-16 ins.
Height from top of rail to top of running board	13 ft. 6 ins.
Height from top of rail to top of brake mast	14 ft. 0 ins.
Height of side door opening in clear	8 ft. 1¾ ins.
Width of side door opening	9 ft. 0 ins.
Width inside of body	8 ft. 6 1-8 ins.
Width over eaves	9 ft. 6 ins.
Width over side sills	9 ft. 0¾ ins.
Centre to centre of truck	30 ft. 6 ins.
Height of end door opening in clear	8 ft. 1¾ ins.
Width of end door opening in clear	7 ft. 9¾ ins.

The steel underframe of these cars is principally of the structural type, composed of plates and shapes, except for the bolster and cross bearer diaphragms, which are pressed steel. The superstructure is of a wooden type with diagonal tie rods in the side, and each side is fitted with double side doors set off centre, and one end is fitted with double hinged end doors with a vertical operated locking device. The roof is of the inside metal type and the car is braced longitudinally by diagonal braces fitted into the side plates and carlines near the centre of the car.

All the cars above mentioned have been built in the United States, where 1,000 gondola cars are also being built, and where an additional order for 3,000 box cars is soon to be turned out all by the Pressed Steel Car Co.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Railway, read a paper on the proper method of firing locomotives, before the Western Canada Railway Club in Winnipeg. Dec. 8.

brick fire walls. The roof, of wood covered with tar and gravel, is carried on the side walls, fire walls, and two rows of steel columns, the latter dividing the length of the shed into three bays of equal width.

The columns divide the length of the shed into sections, of which there are 76, three of the fire wall separated sections containing 18 smaller sections, and the most southerly one 22 sections. These smaller sections are each 15 ft. wide, and in the centre of each one there is a 7 ft. 2 in. door on the driveway side, with a door the full 15 ft. width in every alternate section on the track side. Both sets of doors slide along the wall. In the centre of each of the four larger sections, there is a scale on the driveway side. Passage between the large sections is through three 9½ ft. openings in each of the fire walls.

The Bridge St. end of the shed is sectioned off for the offices of the railway officials, Customs officials, the Shedden Co., and a telegraph office. This office section is 63 feet long, and is entered through a central door on the Bridge St. front, a central hallway leading to all the offices.

It is anticipated that the new shed will improve the handling of bonded freight. Its cost is about $185,000.

Canadian Northern Railway's Land Mortgage Debentures.

Canadian Railway and Marine World for December contained brief particulars of a prospectus, issued in London, Eng., by Lloyds Bank, Limited, offering for subscription £1,500,000 five per cent. C.N.R. land mortgage debentures. The prospectus contained the following letter from Sir Wm. Mackenzie:—

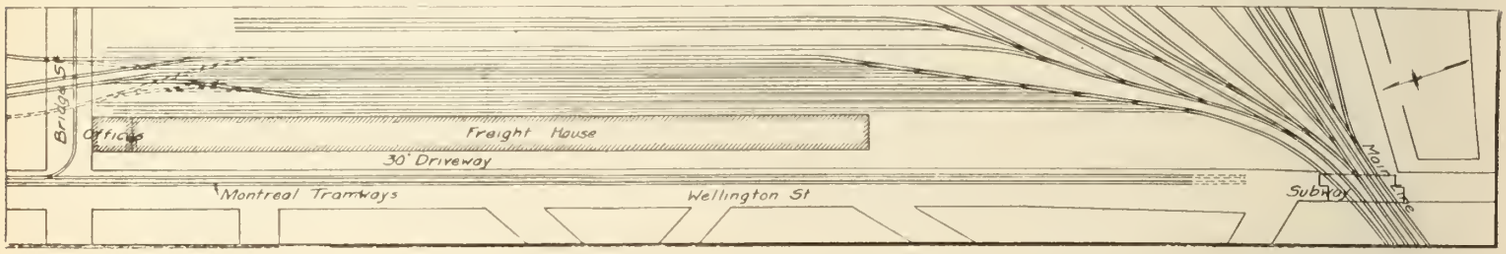
"The Canadian Northern Town Property Co., Ltd. (a Canadian company), has recently been formed for the purpose of acquiring land and developing towns at points on the C.N.R. System, and, except for portions that have already been sold, it is acquiring the whole of the sites of about 300 towns and villages, aggregating approximately 68,700 acres. It is also acquiring valuable property in 172 other towns and villages. The 4½% debenture stock of the company will be secured as a first charge on all the above mentioned property and on the unpaid instalments in respect of land already sold. Pending the transfer to the Town Property Co. of the assets it is to acquire, a charge will be given upon such assets by the trust deed securing the debentures. Davidson and McRae, Land Agents, C.N.R., value, on a conservative basis, the unsold land of this company at $10,500,000. There is money payable in respect of land sold on which the instalments are payable within 18 months, $885,834, and within three years, $2,065,000, making a total of $13,450,834. The land grant assets of the C.N.R. Co., which will be charged as security for the debentures, consist of about 850,000 acres of land unsold, the value of which is certified by Davidson and McRae at $12,750,000; instalments of principal payable on land sold on which at least the first payment has been made, $6,852,445, and there is in the hands of the trustees for the repayment of the prior mortgages and charges, $2,424,451, less outstanding charges, $6,254,860, making a net value of $15,772,036. The security therefore for the land mortgage debentures will be the whole debenture and capital stock of the C.N. Town Property Co., whose assets appear above at $13,450,834; surplus, as above, of land grant assets over prior charges, $15,772,036, making a total of $29,222,870, showing a surplus over the total issue of land mortgage debentures of upwards of £2,500,000.

"The C.N.R. Co. is operating 4,520 miles of lines, which include 644 miles of leased lines. In addition, about 408 miles of track have been laid on new branch lines and will shortly be opened for traffic, and about 300 miles more are under construction. The net earnings of the company have been steadily progressive, as the following figures show:—Years ended June 30, 1908, $3,032,687; 1909, $3,566,362; 1910, $4,344,390; 1911, $4,990,347; 1912, $5,881,045; 1913, $7,023,867. At June 30, 1913, the company had accumulated surpluses to the credit of profit and loss account:—on account of land sales, $16,930,835, and on account of railway operation, $6,778,384; total, $23,709,219."

Safety First on the Grand Trunk Railway.

A safety organization has been formed for the G.T.R. system, under the control of H. G. Kelley, Vice President (Operation), and a circular has been issued from his office covering the details. Four grades of committees are provided for, as follows:—General Safety Committee, the Operating Vice President being chairman; division safety committees, the superintendent of each division being chairman; terminal safety committees, the superintendents of terminals being chairmen of each; and shop safety committees, the master mechanic of each shop being chairman of each committee. The members of the General Safety Committee and some of each of the other committees are permanently appointed on account of their positions as officials, but the arrangement is that the remaining membership shall be held by other employes in periods of six months, giving wider opportunity for wider range of suggestions from the rank and file and for a more general dissemination of safety ideas. The chief purposes of the organization are, the correction of unsafe conditions and practices before an injury has resulted and the investigation of accidents which may occur, with a view to discovering the causes and applying corrective measures where possible, to avoid a recurrence. The introduction of the system is in charge of George Bradshaw, Safety Engineer.

A card has been distributed to all employes of the system, in connection with the movement, conveying the terms of a pledge, as follows:—"I will railroad according to the book of rules. I will do all in my power to guard against unsafe acts on my part. If I see a fellow employe doing his work in an unsafe manner, I will speak to him as a friend, and use my moral influence to have him perform his duties in the safetst pos-



Plan of New G.T.R. Bonded Freight House, showing its Relation to the Point St. Charles Yards.

Grand Trunk Railway Bonded Freight House in Montreal.

The bonded freight house, which the G.T.R. has had under construction for some time on Wellington St., Point St. Charles, Montreal, to the north of the main line from Montreal to Portland, is approaching completion. Its location near the Victoria Bridge, over which nearly all the bonded freight enters the city, is an admirable one for handling this class of traffic with a minimum of car handling through the city. The company's large Point St. Charles freight yards are located immediately to the south of the new bonded freight house.

The new building is 1,200 ft. long on Wellington St., from which it sets back 30 ft., extending southerly from Bridge St. It is 60 ft. wide, with a height of roof of 22 ft. at the inner side of the building, sloping to 19 ft. on the street side, with a 12 ft. projecting hood extending the full length of the building along the 30 ft. strip of the street side, which is paved with granite blocks. The loading of trucks in this driveway will be possible in all weathers. A concrete curb separates the driveway from the sidewalk along the street.

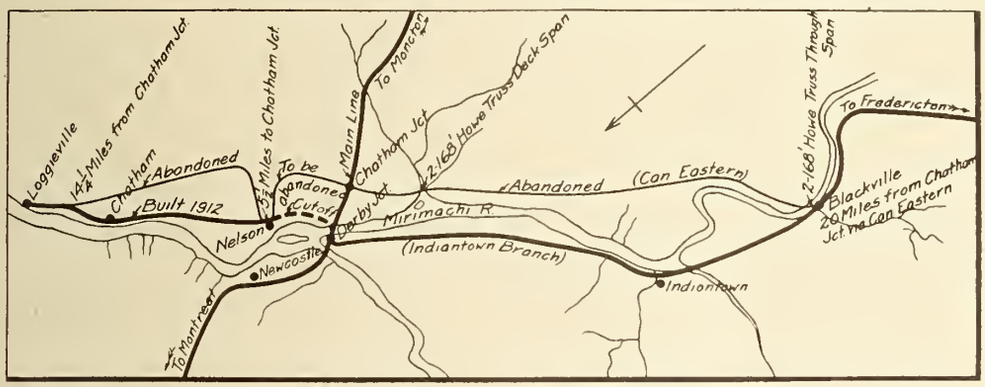
The building is of the latest type of freight shed construction, with brick walls resting on concrete foundations. The floor is of concrete, at an elevation of 4 ft. above the driveway, resting on a sand fill which extends under the whole shed inside the concrete foundation walls. The building is divided into four main freight sections by

sible manner. I will remember and practice at all times, safety first." To this pledge is appended a statement to the effect that 83% of all persons injured on railways are the men who work on them, and 60% of all preventable injuries are due to unsafe practices which can be avoided.

Intercolonial Railway Diversion at Derby Junction.

The accompanying map shows the situation of the Intercolonial Ry., and the old Canadian Eastern Ry., from Loggieville, to Chatham, now a part of the I. R. C., and the mouth of the Miramichi River, and the facilities which will be provided, when the work now in progress, or contemplated is completed.

When the Dominion Government took over the Canada Eastern Ry., extending from Loggieville to Fredericton, with a branch from Derby Jct. to Blackville, it operated a line on both sides of the South West Miramichi River from Blackville to the main I. R. C. line. On account of the large expenditure required to maintain the portion of the Canada Eastern Ry. between Nelson and Blackville, via. Chatham Jct., which included the building of two bridges, and as the local traffic on this portion of the line was very light, it was decided to abandon



Map Showing Diversion of Intercolonial Ry. at Derby Jct., N.B.

it and to build a diversion from Nelson to Derby Jct., and to use the Indiantown branch from Derby Jct. to Blackville as the main line of the Canada Eastern Branch. A diversion from Chatham to Nelson was completed in 1912, and the projected line from Nelson to Derby Jct. will finish it. The mileage to be abandoned on the completion of the work will be as follows: Chatham to Nelson, 14.25 miles; Nelson to Chatham Jct., 5.50 miles; Chatham Jct. to Blackville, 20 miles, total 39.75 miles. The new route between the points will be 33.03 miles as follows: Chatham to Nelson (built), 8.28 miles; Nelson to Derby Jct., contract for construction awarded, 2.75 miles; Derby Jct. to Blackville, Indiantown branch I. R. C., 22 miles.

The proposed diversion at Derby Jct., will leave the main line at the south end of the crossing of the South West Miramichi River, and will run to Nelson, on the old Canada Eastern Ry., 2.75 miles. The maximum gradient will be 1%.

We are officially advised that the contract has been awarded to K. A. Morrison, Union Bank Bldg., Ottawa.

In 1912, there were 236,444 miles of railway in the United States, and the fuel cost for operating trains over them was $230,555,544, or 11.85% of the total operating expenses, and 8.22% of the gross earnings. This means a cost of $4,000 a locomotive a year for fuel alone.

The Conservation of Natural Resources Through the Electrification of Railways.

A paper on this subject was read before the Canadian Railway Club in Montreal by G. Percy Cole, Electrical Engineer, Canadian General Electric Co., which has been abstracted as follows:

Few railway electrifications have been made entirely from an economic standpoint, municipal laws for the abatement of smoke having been largely the cause. The earlier installations centred on the feasibility of heavy electric traction, whereas the present tendency appears to be towards considering the question from an economic viewpoint.

Authority is quoted for the statement that on the average, there is receiving back from the coal consumed, much less than 10% of the latent heat in the coal. It has been shown that in order that electricity may be supplied for all purposes, this conversion efficiency must be raised to at least 25%.

Railways cannot possibly generate electricity for less than twice the cost of a company with miscellaneous power loads. The addition of the railway load would be welcomed by the latter, not only on account of the increase in load decreasing the unit cost, but the railway load would slightly improve the total load factor, making it possible for the companies to offer the railways an attractive price.

Early railway electrifications involved heavy capital expenditure, as high as $90 per k.w., to insure continuity of service, the plants in one instance being duplicated. Since the primary installations in 1907, conditions have changed, and it is only a question of a few years before the country will be covered with transmission networks, from which the railways may secure power, and on account of the non-coincidence of the railway peak with the industrial peak, it will be a desirable addition.

Comparing power generated in a station for distribution to electric locomotives, to that generated directly in steam locomotives, the fuel cost of the former is only about one third that of the latter. Railways use about one fifth of the coal mined, so that if a saving of two thirds of this were effected by the elimination of the steam locomotive, the saving in Canada and the U. S. would be approximately 75,000,000 tons, or $147,000,000, yearly. In addition to this conservation of coal, the railway capacity would be increased, water stations would be eliminated, there would be no reduced locomotive steaming capacity in cold weather, and there would be elimination of smoke, as well as other minor advantages.

Four electrification systems are offered: low pressure d.c., at from 500 to 600 volts; high pressure d.c., at from 1,200 to 3,000 volts; single phase a.c.; and three phase a.c. The future of railway electrification lies between single phase a.c., and high pressure d.c. for main line work, with a.c. having the disadvantage of requiring motors half as large again for the same power, with heavier switching arrangements.

Additions to Grand Trunk Railway Mimico Locomotive House.

Since the addition of the recently purchased mikado locomotives to the G.T.R. motive power, the stalls in the existing locomotive houses on the divisions over which the new power is being used have been found to be too short. One of the principal runs over which they have been employed is that between Black Rock, N.Y., and Toronto, between which points solid coal trains are operated under conditions that are most suitable for such heavy power.

To accommodate these large units the locomotive house at Mimico, just west of Toronto, where all the motive power at that terminal is handled, has required enlargement. Ten stalls, nos. 1 to 10, are being extended 9 ft., by knocking out openings in the concrete wall in front of each pit just large enough to clear the cylinders, and building a new metallic lath and plaster wall to form the passage in front of the locomotives, beyond the old

The present 70 ft. turntable can handle the new locomotives when the tender is loaded with coal and water, but as this is not always convenient this turntable is to be replaced shortly by an 85 ft. one. It is the intention to build a concrete wall at the 85 ft. diameter, and then knock out the existing wall, replacing the existing table, thereby interrupting operations at a minimum.

Arc lights, suspended from the inner wall of the locomotive house for illuminating the turntable, have been replaced by bull's eye lights, attached to the inner wall of the locomotive house near the roof, and focussing down on the turntable; 115 candle power tungsten lights are used, and a superior illumination is obtained.

Strengthening the Forth Bridge.—Bridges of long span, on account of their great dead load, as compared to the live weight of passing trains, have been able to meet the requirements of increased loading without the strengthening that has been necessitated in bridges of smaller dimensions. The great Forth bridge, in Scotland, with its 1,710 ft. spans, has been able to meet the increased requirements in all the main members without increasing the stresses unduly, but it has been found that an increase of 25% in the axle loading has left the floor system rather too light. The main floor girders are of ample strength, and only the superimposed trough construction requires strengthening, which it is proposed to do shortly, following observations on experimental sections in the bridge approaches. The new construction will extend over 7854 ft., and will require 2,500 tons of structural material. An effort will also be made to improve the drainage facilities, as the corrosive effect of sand, cinders and water on the existing floor has necessitated frequent paintings.

G. F. BURGESS, Road Foreman of Locomotives, C.P.R., Macleod, Alta., writes: "Enclosed is express order for subscription to Canadian Railway and Marine World. I had your valuable paper left on my desk every month when I was acting District Master Mechanic at Moose Jaw, and since coming up here I have missed it greatly, as it always contains the current railway news."

Great Northern Railway's Report.

The annual report of the directors for the year ended June 30 shows an increase in the authorized share capital from $210,000,000 to $231,000,000, and a decrease from $147,757,-909.09 to $143,655,909.09 in bonds outstanding. There was paid in $12,958,546 on account of new capital stock, and the directors had in hand 92½ shares of stock for acquiring 74 shares of the St. Paul, Minneapolis and Manitoba Ry. still outstanding. The directors also held $28,069,000 of bonds in the treasury, and there were held by mortgage trustees $14,106,000. During the year, $102,000 of the St. Paul, Minneapolis and Manitoba Ry. bonds were retired through the operation of the sinking fund. Of the bonds held in the treasury, $6,000,000 were issued against construction and acquisition of property, and $5,246,000 against the acquisition of the stock of certain companies.

The construction of new lines included $166,930.03 for the line from Niobe, N.D., to a junction at the international boundary with a branch of the Grand Trunk Pacific Ry., from Regina, Sask., and $2,158,373.25 on account of construction of the Oroville-Pateros-Wenatchee line, connecting with the Vancouver, Victoria and Eastern Ry. at Oroville, Wash., south of the international boundary.

The company made advances to the controlled Canadian companies to pay for property, construction, additions and betterments, as follows:—

Midland Ry. of Manitoba	$571,089.06
Manitoba Great Northern Ry.	18,882.96
Crows Nest Southern Ry.	21,898.18
Vancouver, Victoria and Eastern Ry.	352,092.15
Nelson and Fort Sheppard Ry.	4,592.53
New Westminster Southern Ry.	34.37
Total	$968,876.25

The Midland Ry. of Manitoba issued $4,-300,000 of stock in payment of advances for construction made by the G. N. Ry. and Northern Pacific Ry., each company receiving one half of the total issue.

The gross operating revenues for the year were $78,692,767.22, and the income from operation was $28,676,258.77, an increase of $3,513,366.47 over the year ended June 30, 1912. The operation of the company's lines in Canada are included in the totals, the figures not being reported separately.

Details as to construction work are referred to under the heading of Great Northern Ry. Lines in Canada elsewhere in this issue.

The general balance sheet shows that the company had the following investments in other railways, whose lines formed a part of the system:—

Midland Ry. of Manitoba	$2,172,940.49
Midland Great Northern Ry.	2,061,491.50
Brandon, Saskatchewan and Hudson Bay Ry.	2,150,000.00
Crows Nest Southern Ry.	4,201,968.07
Bedlington and Nelson Ry.	280,000.00
Nelson and Fort Sheppard Ry.	2,093,612.04
Red Mountain Ry.	310,619.07
Vancouver, Victoria and Eastern Ry. and Navigation Co.	19,482,092.15
New Westminster Southern Ry.	279,921.27

Car Illumination.—From the results of a series of tests of gas and electric lighting in the Lake Shore and Michigan Southern Rd. shops at Collinwood, Ohio, a committee has drawn the following inferences: 1. Equally satisfactory illuminating results are obtained with either the centre deck or half deck arrangement, but the latter has a much greater maintenance charge. 2. For good illumination distribution, the light should not be more than two seats apart, excepting indirect or semi-direct, which may be located three seats apart. 3. With direct lighting, head lining color has no effect, but a light color is recommended on account of cheerfulness. 4. A lamp of greater light capacity is desirable, but pending the production of such a lamp, only the most efficient present types should be used.

Recommendations in Connection With Fruit Transportation.

At the annual meeting of the Ontario Fruit Growers' Association in Toronto recently, the following recommendations, made by the Association's Transportation Agent, G. E. McIntosh, of Forest, were adopted:—

That an effort be made to have all navigation companies handling freight and operating upon Canadian waterways placed under the jurisdiction of the Board of Railway Commissioners.

That power be given the Board to adjudicate claims against railway or express companies not settled in 60 days.

That the Board be given jurisdiction in the matter of fixing a penalty for rough handling and pilfering of freight and express shipments.

That fruit inspectors be also cargo inspectors.

The the express minimum be reduced from 20,000 lbs. to 15,000 lbs.

That if necessary the Board of Railway Commissioners be asked to compel the railway companies to allow free transportation both ways for man sent in charge of heated cars.

That the railway companies be asked to provide a special fruit train service from central points in Ontario to Winnipeg during the shipping seasons.

Progress of Construction of the Quebec Bridge.

Work on the bridge across the St. Lawrence River near Quebec was carried on throughout the past summer and autumn. Practically all of the masonry work on the piers is completed, and progress has been made in the erection of the approaches, and of the steel falsework for the anchor spans. The steelwork is being fabricated in an entirely new shop at Lachine, Que., built especially for the Quebec bridge by the St. Lawrence Bridge Co., a newly organized company holding the Quebec bridge contract. It has a capacity of about 2,000 tons a month.

All draughting, designing, etc., for the bridge is being done at Lachine by the St. Lawrence Bridge Co. under the direct supervision of the Board of Engineers, but when the shop designing is completed the whole office will be moved to or near the bridge site.

When construction is started again in 1914, it is expected that erection will be prosecuted from both sides of the river and that the approaches will be completed by the end of next season. No estimate is made as to the time of completion of the anchor arms or of the entire bridge.

The Use of Natural Gas on the Intercolonial Railway.

Since March, 1913, the Intercolonial Ry. has been using natural gas for lighting its passenger car equipment over the principal portions of its main line, including all the first class, second class, sleeping, dining and chair cars in that service, or about 200 in all. Charging stations are located at Halifax, Moncton and Levis, Pintsch gas being also still used from the Pintsch Compressing Co.'s Montreal plant.

The gas is used in the regular Pintsch gas equipment in the cars, at the same pressure, none of the parts being changed, except that it has been found that flat flame burners are not as satisfactory with natural gas as Pintsch gas, and, in consequence, the flat burners are being replaced with mantle burners as the cars go through the shops.

As previously mentioned in these columns natural gas, which is obtained in quantities near Moncton, has replaced producer gas for the gas engines in the Moncton shops. It is also being used in the same plant for the blacksmith, boiler and pipe, shop forges, and in the regular cast iron sectional boilers for heating the general offices and station, and in the water tube boilers for shop heating. During the summer some 30,000 cu. ft. a month are used, and during the winter about 50,000 a month.

The Additions to Angus Shops, Canadian Pacific Railway.

Ten steel freight cars a day, and from 8 to 10 steel passenger cars a month, is the capacity of the latest addition to the Angus shops, C.P.R., Montreal. The new buildings for the construction of steel cars are now operating in full blast. The buildings consist of two structures 100 by 200 ft. and 100 by 182 ft. respectively, for the manufacturing of both classes of cars, a building 72 by 405 ft. for the exclusive manufacture of freight cars, and four buildings 226 by 208 ft. for passenger car work.

The blacksmith shop, wood mill, and wooden freight car shop previously used in the manufacturing of wooden cars, and which had a capacity of 32 cars a day, will be utilized in the work of steel car construction. The only change to be made will be the affording of more space in the blacksmith shop for the presses and machinery required. A new bolt nut and rivet shop, 60 by 420 ft., has been built, to which all this class of machinery can be moved.

Extension of Grain Elevator Facilities at St. John, N.B.

The new C.P.R. elevator at St. John, N.B., with a capacity of 1,032,000 bush., was completed and ready to receive grain during December. The cost of the building is quoted as $600,000. The contractors were John S. Metcalf Co., Montreal.

The Dominion Department of Public Works has awarded a contract for the erection of approximately half a mile of grain shipping conveyor galleries at berths 5 and 6, Sand Point, West St. John, N.B., at an approximate cost of $135,000, to John S. Metcalf Co., Montreal. The conveyor will extend from the end of the old C.P.R. elevator to the inner end of Sand Point basin, round the end of the basin and on top of the Government sheds 5 and 6. Belt conveyors 36 ins. wide, each with a loading capacity of 15,000 bush. an hour, will be installed so that vessels at both sheds may be loaded simultaneously. These conveyors will also receive grain from the new C.P.R. elevator, under construction also by John S. Metcalf Co., and which it is expected to have completed early in the winter. The galleries will be of wood, and will be 56 ft. above wharf level. Thirty-three vessel loading spouts will be provided, and all machinery will be driven by electricity.

Canadian Cartage and Storage Co., Ltd., has been incorporated under the Dominion Companies Act, with $500,000 capital and office at Montreal, to carry on business as cartage contractors and forwarders, and to own and operate vehicles of all kinds, aerodromes, steam and other vessels, etc. F. W. Rous, Westmount, Que., is chiefly interested.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

20728. Oct. 29.—Authorizing C.P.R. to build bridge 0.32 at Lorne St., Kamloops, B.C.

20729, 20730. Oct. 29.—Authorizing C.P.R. to build at grade its ballast pit spur across highways from mileage 0 to 3.05 of said ballast pit spur, at mileage 3 from Bassano, and between Sec. 19-6-11 and Sec. 24-6-12, w. 4 m., on its Weyburn-Stirling Branch.

20731. Oct. 28.—Approving location of C.P.R. station at Mara, B.C.

20732. Oct. 28.—Authorizing Canadian Bridge Co. to build foot bridge and grade crossing over Pere Marquette Rd. at Walkerville, Ont.

20733. Oct. 27.—Authorizing C.P.R. to build, at grade, extension to passing track across Boundary St., Didsbury, Alta.

20734. Nov. 3.—Authorizing C.P.R. to divert road in Sec. 4-23-27, w. 3 m., Sask., and to build its Swift Current Northwesterly Branch at grade across same at mileage 96.3.

20735. Oct. 27.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. (G.N.R.) and C.P.R. to operate trains over crossing at Burrard Inlet, Vancouver, B.C., without previous stop.

20736. Oct. 29.—Authorizing Montreal Light, Heat and Power Co. to lay concrete water tunnel under C.P.R. in Ville Lasalle, Que.

20737. Oct. 30.—Authorizing G.T. Pacific Branch Lines Co. to build spur for Union Coal Co. in Sec. 36-31-24, w. 4 m., Alta.

20738. Oct. 29.—Authorizing G.T. Pacific Ry. to build spur from its main line on 21st St. into Block 12, Inglewood Subdivision, Edmonton, Alta.; crossing of Brazeau Ave. to be built as per regulations.

20739. Nov. 4.—Ordering that rating of 4th class provided in Canadian Freight Classification for blaugas and carbonic acid gas he provided, also for oxygen and acetylene gases in carloads, and dismissing application for a reduced less than carload rating of oxygen gas.

20740. Oct. 28.—Authorizing C.P.R. to build, by means of a bridge, four tracks on its main line across Westminster Road, Lethbridge, Alta.

20741. Nov. 5.—Authorizing Canadian Northern Ry. to build its Bienfait-Estevan Branch over a coal mine in south ½ Sec. 19-2-6, w. 3 m., Sask.

20742. Nov. 6.—Ordering Pere Marquette Rd. to maintain watchman at crossing of highway 1¾ miles west of Kingsville, Ont., pending installation of bell.

20743. Nov. 5.—Relieving C.P.R. from providing further protection at crossing of first public highway west of west switch at Little St. Martin, Que.

20744. Oct. 9.—Relieving G.T.R. from providing further protection at crossing of public road one mile east of Wyoming, Ont.

20745, 20746. Nov. 5, 6.—Approving location of C.P.R. stations at Tribune and Bromhead, Estevan-Forward Branch, and at Westerham, Swift Current Northwesterly Branch, Sask.

20747. Nov. 5.—Extending, to Dec. 31, time within which C.P.R. shall install electric bell as required by order 20017, Aug. 11, at crossing of Main St., Shelburne, Ont.

20748. Nov. 6.—Authorizing C.P.R. and Quebec, Montreal and Southern Ry. to operate trains over crossing at mileage 18.81 from Farnham, Que., without their first stopping.

20749. Nov. 6.—Extending, to Nov. 30, time within which C.P.R. shall install gates at crossing of Centre St., Chatham, Ont., as required by order 19051, Apr. 14.

20750. Nov. 6.—Authorizing C.P.R. to open for traffic portion of its Weyburn-Stirling Branch from mileage 0 to 49.2 east of Stirling, Alta.; speed of trains limited to 25 miles an hour.

20751. Nov. 6.—Authorizing C.P.R. to use bridge crossing St. Lawrence River at mileage 41.9, Farnham Subdivision, Que.

20752. Nov. 6.—Authorizing Canadian Northern Ry. to build across 11 highways on its Alsask Southeasterly Branch, Sask.

20753. Nov. 6.—Authorizing C.P.R. to build extension and passing siding track at mileage 53.43, Toronto Subdivision, Ont., for Godson Contracting Co.

20754. Nov. 7.—Authorizing C.P.R. to build bridge 9.17, Nipigon Subdivision, over Maggot River, Ont., and rescinding order 20084, Aug. 18, so far as it authorizes similar construction.

20755. Nov. 6.—Authorizing C.P.R. to build spur for Kettle River Co., Minneapolis, Minn., at North Transcona, Man.

20756. Nov. 6.—Authorizing G.T.R. to build siding for Canada Stove and Furniture Co., St. Laurent Parish, Que.

20757. Nov. 6.—Authorizing Galbraith & Sons to build tram-logging road under Vancouver, Victoria and Eastern Ry. and Navigation Co.'s trestle bridge 73, near Lincoln, B.C.

20758. Nov. 7.—Approving location of Glengarry and Stormont Ry. from mileage 0 to 24.05.

20759. Nov. 6.—Relieving C.P.R. from providing further protection at crossing of Godfrey Ave., Winnipeg.

20760. Oct. 30.—Dismissing application of S. J. Blair, Calgary, Alta., of order staying proceedings under order 19075, Apr. 16, re C.P.R. branch for Northern Electric and Mfg. Co., Calgary; but determining that order be not construed as prejudicing applicant from claiming that spur cannot be built over his land without first taking expropriation proceedings under Railway Act.

20761. Oct. 30.—Ordering C.P.R. to provide level crossing where Calgary and Edmonton Ry. intersects 32nd Ave., Calgary, Alta., same to be built in accordance with standard regulations and at city's expense.

20762, 20763. Nov. 5.—Ordering Canadian Northern Ry. to provide proper culvert under its tracks at Waller Ave., and to provide crossing at Southwood Ave., Fort Garry, Man., both at the municipality's expense.

20764. Nov. 4.—Amending order 20018, Aug. 14, re C.P.R. crossing of Anderson St., Grenfell, Sask., by providing that cost of watchman he paid: 60% by C.P.R. and balance by the municipality.

20675. Oct. 31.—Ordering Canadian Northern Ry. to file, within ten days, plan in triplicate of freight shed 30 by 40 ft. to be built at St. Albert, Alta., within 30 days after approval.

20766, 20767. Nov. 5.—Ordering Canadian Northern Ry. to provide crossings at Chevrier Boulevard and at Waller Ave., Fort Garry, Man., at municipality's expense.

20768, 20769. Nov. 1.—Dismissing application of City of Saskatoon, Sask., for authority to build Avenue I across C.P.R. at rail level, and authorizing it to build Avenue I across C.P.R.

20770, 20771. Oct. 31.—Finding that should Peace Ave. and Athabasca Ave., Edmonton, Alta., be opened up, such opening would be subject to seniority of Calgary and Edmonton Ry. title and construction as against the city.

20772. Nov. 7.—Rescinding order 20624, Oct. 22, relieving C.P.R. from providing protection at Cote du Sud, Montreal.

20773. Nov. 8.—Extending, to Jan. 15, 1914, time within which C.P.R. shall install bell at crossing of Port Burwell Road, mileage 32.7, Port Burwell Branch, Ont.

20774. Nov. 7.—Authorizing C.P.R. to build spur for loading ties at mileage 44.32 from Chapleau, Ont.

20775. Nov. 6.—Authorizing C.P.R. to build spur for Frontenac Floor and Wall Tile Co., Kingston, Ont.

20776. Nov. 8.—Authorizing C.P.R. to build its Lacombe Easterly Branch across 39 highways, mileage 180.61 to 221.11, Alta.

20777. Nov. 8.—Approving location of C.P.R. station at Port McNicoll, Ont.

20778. Nov. 10.—Rescinding order 20638, Oct. 22, re C. N. Ontario Ry. farm crossing for L. O. Christmann, Beachburg, Ont.

20779. Nov. 10.—Authorizing C.P.R. to open for traffic portion of its Lacombe Easterly Branch from Consort to Monitor, Alta., mileage 139 to 149.

20780. Nov. 8.—Ordering C.P.R. to instal, by June 1, 1914, improved type of automatic illuminated electric bell at crossing of public road east of Mountain Grove station, Ont., 20% of cost to be paid out of the railway grade crossing fund.

20781. Nov. 10.—Authorizing C.P.R. to open for traffic its Lacombe Easterly Branch from Coronation to Consort, Alta., 32 miles, speed of eastbound trains approaching crossings at mileage 132.6 and 136.3 to be reduced to 10 miles an hour, and bells rung continuously between whistling posts and crossings, and rescinding order 17852, Oct. 25.

20782 Nov. 8.—Approving plan showing Logan Drain where it crosses G.T.R. in Blyth, Ont.

20783. Nov. 7.—Authorizing G.T.R. to build bridge 62, Goderich Tp., Ont.

20784. Nov. 10.—Approving location of C.N. Ontario Ry. Parry Sound-North Bay line through Gurd, Nipissing, Himsworth and Ferris Tps., from mileage 209.52 to 233.90 from Toronto.

20785. Nov. 11.—Approving C.P.R. revised location from mileage 5.08 to 7.16, and from mileage 9.68 to 11.51, Schreiber Subdivision, Ont.

20786. Nov. 11.—Authorizing G.T.R. to build siding for Malcolm Furniture Co., Listowel, Ont., and change location of existing track south of the proposed siding.

20787, 20788. Nov. 10.—Approving location of C. N. Ontario Ry. Parry Sound-North Bay Line through Burpee, Burton, Mackenzie, Ferrie, Mills, Patterson, and Pringle Tps., mileage 170 to 209.52, from Toronto.

20789. Nov. 11.—Authorizing Esquimalt and Nanaimo Ry. to build spur across roadway to station at Cowichan Lake, B.C.

20790. Nov. 10.—Ordering C.P.R. to rebuild culvert on its Chalk River Subdivision bridge 53.2, near Arnprior, Ont.; to be completed by Jan. 1, 1914.

20791. Nov. 11.—Relieving C.P.R. from providing further protection at crossing of public road at Cluny, Alta., mileage 116.2, Calgary Subdivision.

20792. Nov. 11.—Recommending to Governor in Council for approval, Toronto, Hamilton and Buffalo Ry. rules and regulations, covering private instructions to train conductors.

20793. Nov. 12.—Authorizing City of Edmonton, Alta., to build its electric railway across G.T. Pacific Ry. at intersection of Twenty-seventh St., between Armstrong and Cochrane Aves., cost of providing half-interlocking plant to be paid equally by city and G.T.P.R.

within six weeks to fence its right of way on property of H. E. Knight, Grand Forks, B.C.; and fixing penalty of $25 a day for each day it shall be in default.

20795. Nov. 12.—Authorizing G.T.R. to rebuild bridge carrying Durham Road over its line at milepost 125.25, near Hanover, Ont.

20796. Nov. 11.—Approving plan and specifications Teillier award drain under G.T.R. in Lot 2, Lake Shore Concession, Rochester Tp., Ont.

20797. Nov. 12—Ordering C.P.R. to instal improved type of automatic electric bell at crossing

20794. Nov. 12.—Ordering Great Northern Rv. of first public highway east of Britannia, Ont., at mileage 3.9, Chalk River Subdivision, 20% of cost to be paid out of the railway grade crossing fund.

20798. Nov. 12.—Amending order 19430, May 19, re Great Northern Ry. subway at Subway Ave., White Rock, B.C.

20799. Nov. 13.—Approving location of Alberta Central Ry. Sounding Creek-Moose Jaw line from mileage 220 to 277.75, east of Red Deer, Alta., and authorizing construction across 56 highways.

20800. Nov. 13.—Authorizing C.P.R. to build spur for Dominion Wire Rope Co., Lachine, Que.

20801. Nov. 13.—Authorizing C.P.R. to build spur for Montreal Light, Heat and Power Co., Lachine Parish, Que.

20802. Nov. 13.—Authorizing C.P.R. to operate spur for Massey-Harris Co. at Medicine Hat, Alta.

20803. Nov. 11.—Authorizing Canadian Northern Ry. to build across and divert public road between Secs. 24 and 23, Tp. 26, R. 23, w. 3 m., on its Alsask Southeasterly line, Sask., and ordering it to instal improved type of automatic electric bell there.

20804. Nov. 13.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. (G.N.R.) by over crossing, to build across and divert Nicola-Princeton highway, Lot 1775, Group 1, Yale District, B.C.

20805. Nov. 1.—Dismissing application of E. A. Purcell, Saskatoon, Sask., alleging that G.T. Pacific Ry. discriminates against his bus line.

20806. Nov. 13.—Dismissing application of Fort Garry, Winnipeg, Man., for order directing Canadian Northern Ry. to build crossing at Fairfield Ave

20807. Nov. 13.—Authorizing Alberta Government to build diversion of road allowance across C.P.R. in s.w. ¼ Sec. 32-18-14, w. 4 m., Alta.

20808. Nov. 13.—Authorizing Canadian Northern Ry to divert Rue La Verandrye, St. Boniface, Man.

20809. Nov. 13.—Authorizing C. N. Ontario Ry. to build across and divert public road on Lot 38, Con. 18, Ferris Tp., stations 981 to 991, and rescinding order 20060, Aug. 13.

20810. Nov. 13.—Authorizing C.P.R. to build, at grade, its siding extension across public road at Worthington, Ont.; and to build sidings for Mond Nickel Co., Coniston, Ont., from its right of way, at Worthington, across public road and lands adjoining, in Lot 2, Con. 2, Drury Tp.

20811. Nov. 13.—Authorizing C.P.R. to build extension to siding for Dominion Radiator Co., Toronto.

20812. Nov. 13.—Ordering North Cowichan municipality, B.C., to move highway crossing at milepost 41, 6½ ft; and rescinding order 6642, Feb. 27, 1909.

20813. Nov. 13.—Amending order 19506, June 7, re crossing of Canadian Northern Ry. by Regina Municipal Ry., on Fourth Ave.

20814. Nov. 13.—Approving plan and specifications of Ellice Maitland relief drain under C.P.R. on Lots 29 and 30, Con. 18, Elma Tp., Ont.

20815. Nov. 12.—Authorizing Canadian Northern Ry. to operate trains over Thirteenth St., Brandon, Man., without first stopping; cars of Brandon Municipal Ry. to be stopped before crossing, and conductors of latter cars to operate interlocker levers.

20816. Nov. 12.—Ordering C.P.R. and Great North Western Telegraph Co. to remove wires from poles on Queen St. North, between King and Weber Sts., Berlin, Ont.; city to make provision by which companies have right to string wires on Frederick and King Sts.

20817. Nov. 11.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build undercrossing for A. R. Farewell, Oshawa, Ont., to be completed within 3 months.

20818. Nov. 14.—Authorizing C.P.R. to build spur for P. Hamilton Co. across Sherbrooke St. and along Water St., Peterboro, Ont.

20819, 20820. Nov. 14.—Authorizing G.T.R. to build sidings for Grand Gypsum Ltd., North Cayuga Tp., at Nelles Corners, Ont.; and Dominion Tar and Ammonia Co., Hamilton, Ont.

20821. Nov. 13.—Authorizing Canadian Northern Ry. to build across Winnipeg Electric Ry. on Jubilee Ave.

20822. Nov. 15.—Authorizing C.P.R. to use bridge 45.6, Orford Subdivision, Que.

20823. Nov. 17.—Authorizing G. T. Pacific Ry. to build bridge across Nechaco River, mileage 371.4, Prince Rupert Easterly, B.C.

20824. Nov. 15.—Authorizing G.T.R. to operate bridges 217, over Jacques River, mileage 13.07; 232, over English River, mileage 36.85; and 236, over Chateauguay River, mileage 43.82, Que.

20825. Nov. 17.—Approving location of Montreal and Southern Counties Ry. from Central Vermont Ry. at St. Cesaire to boundary between St. Cesaire and St. Paul de Abbotsford parishes, Que.

20826. Nov. 14.—Amending order 20514, Oct. 6, re installation of electric sign and bell, by Michigan Central Rd., at Townsend, Ont.

20827. Nov. 14.—Authorizing C.P.R. to build bridge 92.7 (Don Viaduct), near Donlands, Ont.

20828. Nov. 14.—Authorizing C.P.R. to take, for double track, certain land in York Tp., Ont.

20829. Nov. 17.—Amending order 18837, Mar. 12,

re operation of G. T. Pacific Ry. on its Regina-Moose Jaw Branch, for construction purposes, etc.

20830. Nov. 18.—Approving revised location of Canadian Northern Ry. Calgary Southerly Line, mileage 10.59 to 13.21, 13.74 to 16.16, 35.49 to 38.05, and 93.21 to 100.79.

20831. Nov. 18.—Amending order 20609, Oct. 15, re revised location of Campbellford, Lake Ontario and Western Ry. (C.P.R.).

20832. Nov. 15.—Authorizing City of Edmonton, Alta., to cross Canadian Northern Ry. at grade with its electric railway at Athabasca Ave.

20833. Nov. 18.—Authorizing G.T.R. to build additional track across John St., Weston, Ont.

20834. Nov. 18.—Authorizing Town of Sudbury, Ont., to build highway crossing over C.P.R. Stobie Branch, to connect Bond St. with Notre Dame St.

20835. Nov. 18.—Authorizing Montreal and Southern Counties Ry. to build bridge across Yamaska River, near St. Cesaire, Que.

20836. Nov. 18.—Approving location C.P.R. station at Gravel, mileage 32.50, Nipigon Subdivision, Ont.

20837. Nov. 18.—Authorizing St. Lawrence and Adirondack Ry. to build highway across its line, just south of Bellevue station, Que.; cost to be paid by Chateauguay Parish, and maintenance borne by railway.

20838. Nov. 19.—Approving location and details of Canadian Northern Ry. special station to be built at Gravelbourg, Sask.

20849. Nov. 19.—Amending order 8627, Oct. 21, 1909, re G.T.R. station at Guelph, Ont.

20840. Nov. 18.—Authorizing C.P.R. to build spur for J. Elie, Montreal.

20841. Nov. 18.—Authorizing G. T. Pacific Branch Lines Co. and C.P.R. to operate trains over crossing at Frobisher, Sask., without their first stopping.

20842. Nov. 19.—Authorizing C.P.R. to operate trains over drawbridge over Kaministikwia River, at Fort William, Ont., without their first stopping.

20843. Nov. 19.—Authorizing C.P.R. to build spur for Quaker Oats Co., Saskatoon, Sask.

20844. Nov. 11.—Ordering Canadian Northern Ry. and G. T. Pacific Ry. to build transfer track near Dana, Sask.

20845. Nov. 17.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to install improved type of automatic electric bell at highway crossing between Cons. 3 and 4, Tyendinaga Tp., mileage 61.87; to be installed by time line is opened for traffic.

20846. Nov. 19.—Establishing collection and delivery limits for Express Companies in Hamilton, Ont.

20847. Nov. 19.—Authorizing C.P.R. to open for traffic portions of double track on Lake Superior Division, Ont.:—Azilda, milcage 86.0 to 95.5; mileage 113.2 to Cartier, mileage 114.6, Cartier Subdivision; Nemegos, mileage 120.9 to 125.0; Poulin, mileage 127.0 to 130.0, Chapleau Subdivision; Esher, mileage 7.1 to 9.0; mileage 18.9 to Goldie, mileage 34, on White River Subdivision; Redlise, mileage 11.2 to 21.0, Schreiber Subdivision; and Selim, mileage 9.3 to Rossport, mileage 14.3; mileage 29.0 to Gurney, mileage 39.1, Nipigon Subdivision.

20848. Nov. 18.—Authorizing G. T. Pacific Ry. to rebuild bridge across Kitsumkaylum River, mileage 91, Prince Rupert East, B.C.

20849. Nov. 12.—Ordering Canadian Northern Ry. to provide crossing at Fort Garry Boulevard, Fort Garry, Man.; cost to be paid by municipality.

20850. Nov. 19.—Authorizing Canada Southern Ry. to build branch from east of Welland station, Ont., to Lot 22, Con. 5, Humberstone Tp., crossing Ontario Road, Commercial St., Dover St., Dain St. and Town Line Road between Crowland and Humberstone Tps.

20851. Nov. 19.—Relieving C.P.R. from providing further protection at first crossing east of station at Tyndall, Man.

20852. Nov. 17.—Authorizing Niagara, St. Catharines and Toronto Ry. to open for traffic its line between St. Catharines and town line between Grantham and Niagara Tps., Ont., 7.1 miles, for three months from date; and authorizing it to operate cars over crossing of G.T.R. at Welland Ave., St. Catharines; all trains and cars to be flagged over crossing by day and night watchmen pending installation of interlocker.

20853. Nov. 20.—Ordering Canadian Northern Ry., within three weeks, to extend siding at Sleeman, Ont., to accommodate 38 cars.

20854. Nov. 13.—Authorizing City of Edmonton, Alta., to operate its street railway cars over G. T. Pacific Ry. on Twentyfirst St., pending installation of half interlocker; cars to stop and be flagged over crossing by street railway conductors.

20855. Nov. 20.—Authorizing C.P.R. to build siding for Cowan Co. at Parkdale, Ont.

20856. Nov. 20.—Ordering Edmonton, Dunvegan and British Columbia Ry. to build farm crossing for Wm. Dives, Independence, Alta.

20857. Nov. 19.—Ordering G. T. Pacific Ry. to build no. 1 B.R.C. station and platform at Telkwa, B.C.; and to build siding for 12 freight cars at west side of bridge, and provide way freight and local passenger service.

20858. Nov. 20.—Authorizing Town of Stony Plain, Alta., to build Main St. across Canadian Northern Ry.

20859. Nov. 21.—Ordering C.P.R. to install gates at crossing of Whyte St., Edmonton, Alta., to be operated by day and night watchmen; 20% of installation to be paid out of railway grade crossing fund, 2-3 of remainder by C.P.R., and balance by city; watchmen to be paid: 2-3 by C.P.R. and balance by city.

20860. Nov. 21.—Establishing collection and delivery limits of express companies in Cochrane, Ont.

20861. Nov. 20.—Dismissing complaint of Otis-Fensom Elevator Co. against proposed 6th class rating in Supplement 2 to Canadian Freight Classification 16, submitted by Canadian Freight Association for approval.

20862. Nov. 21.—Ordering that Canadian Northern Ry. trains be stopped before proceeding over Fournier and Browning Aves., Carman, Man., and speed in crossing limited to 4 miles an hour; posts showing word "Stop" to be erected at east side of Fournier Ave. and at west side of Browning Ave., 75 ft. from crossing; company to make entrance for vehicular traffic from lane at back of station building, midway between Fournier and Browning Aves., the town undertaking to trim trees at southwest corner of Browning Ave. to 22 ft. above rail.

20863. Nov. 20.—Authorizing C.P.R. to operate over the bridge across McKellar River, Fort William, Ont.

20864. Nov. 19.—Authorizing C.P.R. to build spur for J. L. Abbott, Toronto, at mileage 35.07, Balsam Lake, Ont.

20865, 20866. Nov. 21.—Establishing express collection and delivery limits in Sudbury and North Bay, Ont.

20867. Nov. 20.—Authorizing City of Winnipeg to extend Godfrey Ave. across Canadian Northern Ry. Oak Point Branch.

20868. Nov. 20.—Ordering C.P.R. to build bridge with 30 ft. roadway over its tracks on Eighth Ave. West, Moose Jaw, Sask., with extension sidewalk 6 ft. wide on one side of said bridge; $5,000 to be paid out of railway grade crossing fund, 75% of remainder by C.P.R., and 25% by city; substructure to be maintained by C.P.R., and roadway and sidewalk by city; and rescinding order 17206, July 25, in this connection.

20869. Nov. 21.—Amending order 16978, July 11, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) undercrossing of Oshawa Electric Ry. on Simcoe St., Oshawa, Ont.

20870. Nov. 13.—Approving location of G. T. Pacific Branch Lines Co.'s Mountain Park Coal Branch from mileage 0 to 30.24, North Alberta District.

20871, 20872 Nov. 21.—Authorizing G.T.R. to build sidings for A. Sherk, Whitehall, Ont., into Northern Vencer Co.'s premises, Lot 28, Con. 11, McMurrich Tp.; and for Whitcside and Arnold, Barrie, Ont.

20873 Nov. 11.—Authorizing Keyes rural municipality 303, Sask., to build highway crossing over Canadian Northern Ry., between Secs. 25 and 36, Tp. 33, R. 1, w. 2 m., Sask.

20874 Nov. 20.—Ordering Canadian Northern Ry. and G. T. Pacific Ry. to erect gates at First St. and Namayo, Syndicate and Alberta Aves., Edmonton, Alta; 20% of cost at First St. and Namayo and Syndicate Aves. to be paid out of railway grade crossing fund, remainder equally by companies; city to pay watchmen; maintenance of gates divided equally between companies; 20% of cost of gates at Alberta Ave. to be paid out of railway grade crossing fund, 2-3 of remainder by companies, and 1-3 by city; and maintenance, 2-3 by companies and 1-3 by city.

20875. Nov. 21.—Authorizing Canadian Northern Ry. to build across Winnipeg Electric Ry. near Helen and Pembina Sts.

20876. Nov 22.—Rescinding order 19310, May 16, which authorizes G.T.R. to build bridge 149, Mariposa Tp., Ont.

20877. Nov. 24.—Authorizing C.P.R. to build siding for Quaker Oats Co., Peterboro, Ont.

20878 Nov 1.—Ordering Canadian Northern Ry. to furnish a daily passenger service west of Alsask, Sask., satisfactory to an engineer of the Board; to be effective by Nov. 10.

20879. Nov. 24.—Ordering G.T.R. to build spur on south side of Kaministikwia River for Mount McKay Pressed Brick Co., Fort William, Ont., crossing 2 city roads and street railway.

20880. Nov. 24.—Authorizing G. T. Pacific Ry., subject to inspection by B.C. Public Works Department, after completion, to build main line across Government Road at mileage 400, Prince Rupert East.

20881. Nov. 24.—Authorizing G. T. Pacific Branch Lines Co. and C.P.R. to operate trains over crossing in east half of Sec. 23-17-20, w. 2 m., Sask., without first stopping.

20882. Nov. 24.—Authorizing G. T. Pacific Ry. to build its Lake Superior Branch across highway at mileage 17.9, Oliver Tp., Ont.

20883. Nov. 24.—Establishing express collection and delivery limits in Leamington, Ont.

20884. Nov. 24.—Extending, for one month from date, time within which C.P.R. shall complete extension of siding for Quinlan & Robertson in Lot 10, Con. 8, Huntingdon Tp., Ont.

20885. Nov. 24.—Authorizing G.T.R. to build siding for Pollard Manufacturing Co., Niagara Falls, Ont.

20886. Nov. 25.—Extending, for 30 days from date, time within which C.P.R. shall complete fencing portion of right of way from mileage 6.8 to 7.6, on east side of track, and repairing fences on west side of track, on its Kingston and Pembroke Branch.

20887. Nov. 21.—Approving plan showing two new abutments for replacing piers at C.P.R. bridge, mileage 35.4, Chalk River Subdivision, Ont.

20888. Nov. 21.—Authorizing C. N. Ontario Ry. to build bridge over Indian River, Richards Tp., at mileage 107.85 from Ottawa.

20889. Nov. 25.—Authorizing Canadian Northern Ry. to build across public road between Secs. 14 and 15, Tp. 26, R. 26, w. 3 m., Sask.

20890. Nov. 25.—Authorizing G.T.R. to build spur from siding serving Queenston Quarry Co., for S. W. Marchment, on Lot 48, Niagara Tp., Ont.

20891. Nov. 20.—Ordering Canadian Northern Ry., within 30 days, to submit for approval of Board's Engineer detail plans showing half interlocking plants to be installed at various crossings in Edmonton, Alta., as required under orders 5598, 6751 and 7291; work to be completed within 3 months after approval; cost of diamonds to be paid by City of Edmonton, and cost and maintenance to be paid half by city and half equally between C.N.R. and G. T. Pacific Ry.; leave reserved to G.T.P.R. to appeal to Supreme Court upon competency of Board to apportion cost as provided; and rescinding order 14991, Sept. 11, 1911, in this connection, upon completion of interlocking plants.

20892. Nov. 25.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for Egg-O Baking Powder Co., Hamilton, Ont.

20893. Nov. 25.—Ordering C.P.R. to erect fences along portions of right of way near Savona, B.C., work to be completed within 3 months from date; and rescinding order 17358, Aug. 27, 1912, in so far as it relieves C.P.R. from erecting fences between Savona and Pennys, B.C.

20894. Nov. 24.—Authorizing Hillsburgh Rural Municipality 289, Sask., to build highway across Canadian Northern Ry. 250 ft. west of west switch, D'Arcy, Sask.

20895. Nov. 25.—Approving location and detail plans of Windsor, Essex and Lake Shore Rapid Ry. station on Talbot Road, Maidstone, Ont.

20896. Nov. 27.—Authorizing C.P.R. to open for traffic portion of double track from milcage 121 to 131.3, at Broadview, Sask.

20897. Nov. 25.—Authorizing C.P.R. to build, at grade, its Snowflake Westerly Branch across 9 highways, mileage 0 to 9.10, Man.

20898. Nov. 25.—Authorizing C.P.R. to build, at grade, switching lead at mileage 123.0 from Montreal, Smith's Falls Subdivision, Ont., across public road between Cons. 3 and 4, Montague Tp.

20899. Nov. 27.—Approving revised location of C. N. Montreal Tunnel and Terminal Co.'s tunnel line from St. Antoine St. to junction with main line, at Montreal.

20900. Nov. 26.—Approving Canadian Northern Ry. plan of freight shed to be built at St. Albert, Alta., as required by order 20765, Oct. 31.

20901. Nov. 25.—Authorizing G.T.R. to build siding for Harris Abattoir Co., Hamilton, Ont.

20902. Nov. 25.—Ordering Great Northern Ry. to build open ditch on north side of its line at Hjorth Road, Tynehead Station, B.C.

20903, 20904. Nov. 25.—Authorizing C.P.R. to build spur for W. Rutherford, Stephen, B.C., and siding for National Builders' Supply and Enamel Concrete Brick Co., Montreal, Que.

20905. Nov. 25.—Authorizing Saskatchewan Government to build highway over G. T. Pacific Ry. near northeast corner of Sec. 17-38-26, w. 2 m.

20906. Nov. 27.—Authorizing B.C. Public Works Department to build overhead highway crossing over G. T. Pacific Ry. about 127 miles from Prince Rupert, near Fiddler Creek.

20907. Nov. 25.—Authorizing G.T.R. to build extension to siding for M. Chew, on Lot 21, Con. 3, Tay Tp., Ont.

20908. Nov. 27.—Authorizing Canadian Northern Ry. to remove spur to Exhibition Grounds, Brandon, Man., built under order 18348, Dec. 20, 1912.

20909. Nov. 28.—Extending, to Dec. 31, time within which British Columbia Electric Ry. shall complete work at crossing of Esquimalt and Nanaimo Ry., near Russell, B.C., as required by order 18733, Feb. 18.

20910. Nov. 27.—Authorizing C.P.R. to build spur for Pembroke Shook Mills, Ltd., Pembroke, Ont.

20911. Nov. 29.—Authorizing G. T. Pacific Branch Lines Co. to carry traffic over portion of Mountain Park Coal Branch, Alta., between mileage 0 and 30.24; speed not to exceed 12 miles an hour.

20912. Nov. 25.—Re special casthound tariff rates from Vancouver, B.C., published by C.P.R. from time to time, to apply to carload shipments of lumber, shingles, and articles taking lumber and shingle rates. This order is given in full on another page.

20913. Nov. 28.—Amending order 20411, Sept. 23, re installation of automatic electric bells by Campbellford, Lake Ontario and Western Ry. (C.P.R.) and G.T.R. at crossing between Lots 16 and 17, Con. A, Haldimand Tp., Ont.

20914. Nov. 28.—Authorizing C.P.R. to build its Calgary and Edmonton Ry. Lacombe Easterly Branch, across highways at mileage 181.93 and 186.01.

20915. Nov. 29.—Authorizing C.P.R. to build grade crossing at mileage 64.32, East Kootenay District, B.C.

20916. Nov. 29.—Authorizing C.P.R. to build road diversion in Sec. 27-8-8, and to build its Weyburn-Stirling Branch across highway between Secs. 27 and 28-8-8, w. 3 m., Sask.

20917. Nov. 29.—Amending order 18457, Dec. 30, 1912, re C.P.R. crossing of May and Ridgeway St., Fort William, Ont.

20918. Nov. 29.—Approving C. N. Ontario Ry. revised location through unsurveyed territory at Clemow Lake, Barron Tp., Nipissing District, mileage 133.45 to 134.75.

20919. Nov. 29.—Authorizing C. N. Ontario Ry. to open for traffic its branch from Oshawa station to material yard, south of William St., 2¼ miles.

Port Huron Fire and the Grand Trunk Railway's Western Shops.

The G.T.R. took immediate steps, following the disastrous fire of Nov. 26, which devastated practically the whole of its Port Huron, Mich., car shops, to handle the repair work that formerly was done there. The accompanying illustrations give a birds-eye view of the plant before, and immediately after, the fire. The only building of the entire plant not destroyed was, strangely, the lumber shed on the extreme left, alongside the wharf on the river. The building on the extreme right in the view of the plant before destruction, was the office, to the rear of which was the machine shop, and a long passenger car shop, extending nearly the full length of the grounds. To the left of the office building, was the blacksmith shop, adjoining which was the mill, with the freight car shop to the rear of both buildings, the mill forming a wing thereof. As the illustration of the plant following the fire shows, nothing remains but the brick walls of the office, and the machine and passenger car shops. The insurance adjustment is going on and until this is completed it will not be decided just what will be done in the way of replacing the plant.

To meet immediate requirements the G. T.R. has purchased the Whipple Car Co.'s plant at Elsdon, Ill., in the heart of the G. T.R. Chicago freight yard. The Whipple Co. was going out of business, so the plant proved a particularly fortunate means for the G.T.R. yards. This Elsdon plant covers about 20 acres, and comprises a modern group of buildings, none of which are over five years old. The office building, stores building, power house and mill building are of brick and steel construction. There are three main buildings for the forge shop and erecting shops, two of which are 80 by 500 ft., and the third, 80 by 400 ft., each containing three longitudal tracks. These three buildings are of steel construction sheathed in galvanized iron. All the machinery throughout the plant is electrically driven, from power generated in the plant. Electric lighting is handled from the same power house. The G.T.R. took possession of the plant Dec. 20, and as soon as an inventory of the stock on hand is made, which is expected will be Jan. 1, it will be placed in service.

It is the G.T.R.'s intention to transfer much of the staff as desire to go, from Port Huron to Elsdon it being the President's express wish that all the old employes be cared for. From 400 to 500 can be used in the new plant, but it will not be quite large enough to handle all the repairs on the western line. Since the fire the pressing repairs on these lines have been handled in the company's Canadian shops. All the parlor and dining cars have been taken to Montreal for overhauling, adding to the congestion in that shop.

We were offcially advised, Dec. 15, that the loss on buildings and contents burned at Port Huron amounts to about $350,000. It had not then been decided whether the shops would be rebuilt or not.

Mount Royal Tunnel, Canadian Northern Railway.

The last barrier in the C.N.R. tunnel under Mount Royal, Montreal, was blasted out Dec. 10, at 7 a.m., when the gangs working from both ends met. In the afternoon, a party of engineers and other officials were taken through the tunnel by S. P. Brown, Chief Engineer, and H. T. Fisher, Tunnel Engineer of the Canadian Northern Montreal Tunnel and Terminal Co., in a train of work cars from the west portal at the back of the mountain to the Dorchester St. shaft, on the site of the proposed Montreal station.

This tunnel, which was described in detail in Canadian Railway and Marine World for August, 1913, is 3 1-3 miles long, with east portal, station 137.0, between Lagauchetiere and Latour Sts., in Montreal, and the west portal, station 318.0, at the back of the mountain at the C.P.R. crossing. Briefly, the tunnel extends practically the full length through Trenton limestone and essexite, with igneous dykes. The interior section will be 22 by 30 ft. neat excavation, except near either portal, where it will be arched with concrete blocks. The estimated quantities to be excavated for the tunnel are 390,000 cu. yds. of rock and 13,000 cu. yds. of earth, and there will enter into its construction 61,000 cu. yds. of concrete and 1,000 tons of steel and iron. In addition, the work has necessitated 1,400 lineal ft. of shafting and tunnelling, not in the main tunnel line.

In the pushing forward of the work, four headings were used, with part of the time a fifth. Apart from preliminary work of preparing approaches, the actual tunnel work commenced from the west portal in Sept., 1912, and at the same time work was begun on the sinking of shafts at Dorchester St., station 145.0, and Maplewood Ave., station 265.0, the former 55 ft. deep, and the latter, 240 ft. From the Dorchester St. shaft, the tunnel heading, which in each case was from 8 to 10 by 12 ft., was pushed towards the west portal, with a short section to the east, towards the city portal. From the Maplewood Ave. shaft, the heading was driven in both directions, meeting that from the west portal at station 285.0 in April, 1913. The two headings from Maplewood Ave. and Dorchester St. were the ones that met Dec. 10, at station 208.0, completing the heading the full length of the tunnel.

Following up the smaller heading, principally from the west end, which was through first, the smaller heading has been timbered and the upper section of the bore removed to full dimensions. A large portion of the west end has been completed in this manner, leaving only the benches, which, through a short section, have also been removed. On the completion of the upper heading, the benches will be removed by steam shovel.

The tunnel at the Dorchester St. shaft, the terminal site, is level, at elevation 144.4 ascending from that point on a 0.6% grade to the west portal. The greatest depth of rock over the tunnel is near the point where the last headings met, where there is 600 ft. of rock above.

The small working heading was pushed through in the short period of 15 months. The best progress made was 810 ft. in 31 working days. The monthly progress in each heading averaged 420 ft., giving a gross monthly progress of 11,000 ft.

Following is comparative data of progress with other well known railway tunnels:—

Tunnel	Size of Heading	Distance	Time	Material
Arlberg	....	641	1 mo.	Gneiss.
Simplon	6.5x9.5	685	1 mo.	Hornblende and Mica.
Loetschberg	6.5x10	1013	1 mo.	Triassic limestone.
Mount Royal	8x12	810	31 days	Hard limestone and dykes of igneous rock.

The distance driven in 31 consecutive working days at the Loetschberg tunnel was greater than that in the Mount Royal tunnel, but it is said that the Triassic limestone in the former was ideal for making distance.

Grand Trunk Railway Car Shops at Port Huron Before and After the Fire.

Suit Against the Grand Trunk Ry. re Toronto Union Station.—An action has been instituted in Boston, Mass., by the Westinghouse, Church, Kerr and Co., New York, against the G.T.R. for the purpose of securing damages for an alleged breach of contract. Contract was entered into by the late C. M. Hays, President, G.T.R., for the preparation of plans and the erection of the new union station and terminals at Toronto. The contract was subsequently cancelled by the G.T.R., and for this cancellation $1,000,000 is claimed as damages. It is stated on behalf of the G.T.R. that the Board of Railway Commissioners issued certain orders after the signing of the contract which made it impossible that the original plans could be carried out, and that the cancellation of the contract was justified.

The G.T. Pacific Ry. hotel Fort Garry, at Winnipeg, was opened for guests, Dec. 9. It is 14 stories high, and is of Canadian granite and buff limestone. It is located on Broadway Ave., in close proximity to the Fort Garry Union Station, and almost on the site of the historic Fort Garry, some ruins of which yet remain.

The Eastern Terminal Elevator Co., Ltd., incorporated under the Manitoba Companies Act, has been authorized to do business in Ontario, with capital to be utilized in that Province, limited to $250,000. F. H. Young, Fort William, is its attorney.

Issue of Note Certificates by Canadian Pacific Railway.

The following official statement was given out by the C.P.R. management in Montreal, Dec. 8:—

"At the regular meeting of the directors today, a trust fund was created to be known as The Special Investment Fund, made up of deferred payments on land sales, and securities in which the cash proceeds of land sales are invested, to the aggregate of $55,000,000. The Royal Trust Co. of Montreal is named as trustee of the fund.

"It was decided to offer the holders of the ordinary capital stock of record Dec. 23rd, 1913, in proportion to their respective holdings, $52,000,000, note certificates carrying interest at the rate of 6% per annum, payable semi annually, at the price of 80% of their par or face value.

"The C.P.R. Co. engages and promises that the interest on the note certificates will be promptly paid, and that all of the note certificates will be redeemed at their face value on or before Mar. 2, 1924, but they may be redeemed in part by drawings at any time when the trustee has funds in hand for the purpose.

"The amounts accruing from time to time from deferred payments on land heretofore sold and the interest thereon, and from securities in which the proceeds of land sales have been invested, will be utilized by the trustee, in so far as may be necessary, or will be supplemented by the company if required, to effect the payment of interest on the note certificates, and the repayment of the principal on or before maturity."

It was also announced that shareholders would be entitled to subscribe for one note certificate for eight full shares of stock held. Payments are to be made as follows:—$32 on each $100 note on Feb. 2, and $48 on March 2.

The day following the above announcement, Sir Thos. G. Shaughnessy made the following statement:—"The trust fund which has just been created by the company is to be devoted to the payment of interest on the note certificates and to their redemption at par at or before maturity, and is composed of the deferred payments on the securities in which the proceeds of the land sales, heretofore made, are invested. It does not include any of the company's unsold lands or other extraneous assets. These remain intact for the future benefit of the shareholders, and the directors are quite satisfied that the special income from these sources will be sufficient for all the company's purposes."

On Dec. 12, Sir Thos. G Shaughnessy issued another statement as follows:—"The company is not short of funds by any means, its bank account being of very comfortable proportions, but it has for many years been its policy to be strong in its cash resources, and, considering the magnitude of the enterprise, this is manifestly prudent. Works of improvement, now in progress, to provide for its traffic, will require a considerable sum to finish. The additional railway mileage constructed, and nearing completion, represents an expenditure of upwards of $40,000,000. To meet this expenditure the directors have authority to issue and sell 4% consolidated debenture stock, but this is not the time to go into the market with a large issue of that security to the prejudice of the commanding position that it has always had in the London market, and will again have when normal conditions are restored. Any issue of debenture stock, excepting such small amounts as may be required to meet the demands of the market, must be postponed until some more opportune time. Neither would an increase of the company's capital stock be desirable just now. In view of these circumstances, the directors decided to ask the shareholders to loan the company the money likely to be required for its purposes during the next year or two on terms that would be advantageous to them, and the issue of $52,000,000 of note certificates was determined upon accordingly.

"When the proceeds of land sales, to an amount exceeding $62,000,000, had been invested in the property, the land assets were permitted to accumulate, and these now constitute the special investment fund of $55,000,000 that has been set aside and ear marked as applicable only to the principal and interest of the note certificates. Of course it goes without saying that were the company to go into the market to borrow money on its own credit in the ordinary way, better terms could be arranged, but this was a special transaction between the company and its shareholders, and it was intended that the shareholders should have the distinct advantage to which they are entitled. These note certificates will constitute no permanent charge against the company's revenue; indeed, they make no demand whatever on the income from the company's traffic It is a debt that will obliterate itself in the course of a few years. The unsold lands and other extraneous assets will remain undisturbed for the future benefit of the shareholders, and it is evident that the income from them will be sufficient for the purposes to which it has, for some years, been largely devoted."

Intercolonial Railway Construction, Betterments, Etc.

Halifax Ocean Terminals.—A contract for the first section of these terminals has been let, according to an Ottawa dispatch to Foley, Welch, Stewart and Fanquier, at an estimated cost of $5,208,748. A description of the work to be done under the proposed contract was given on pg. 462 of our Oct. issue. In connection with these new terminals, we have been officially advised that the existing tracks to North St. station, the deep water terminus and pier No. 2 will be retained, but nothing has been definitely decided as to the existing stations at North St. and at Richmond. The new union passenger station to be provided at the ocean terminals will be designed to accommodate all railways entering the city.

The New Station at Truro, N.S., has been completed. It is one of the largest and most modern stations on the line. It is 337½ ft. long, of which 140 ft. is two stories high, with a central tower 19 ft. square; and is 50 ft. deep. The building is of brick and concrete, and is finished with natural woods in the interior. The main entrance is under the tower, and leads to the general concourse, 61 by 50 ft., in which is located the ticket office. On the right is the ladies' waiting room and retiring room; the second class waiting room, with lavatories; and on the left is the smoking room, the station master's office, telegraph office and trainmen's room. A passage on the left leads to the general lavatories and the lunch and dining rooms, the latter being 80 by 50 ft. and in the single story part of the building. In the opposite wing, in the single story section, are baggage room, conductors' box room, express room and office and mail room. The second floor contains offices for the superintendent and the despatching staff, with six bedrooms.

Diversion of Line in Cape Breton.—Tenders are under consideration for the building of a diversion from North Sydney to Leitches Cove, on the Cape Breton section.

St. Romuald-Chaudiere Curve Second Track.—The contract for the second track work from St. Romuald to Chaudiere Curve, Que., 3.75 miles, to which reference was made in our October issue, has been let, we are officially advised, to Soper and McDougall, Ottawa. The work is not heavy, and there is no bridgework and does not involve any diversion from the existing line. The present track is to be raised at one or two points to improve the alignment. The contract does not include work at the crossing of the National Transcontinental Ry.

Bridge Reconstruction.—A contract is reported to have been let to the Dominion Bridge Co. for the building of four bridges, viz.:—over the Beeamour River, over the National Transcontinental Ry., at Riviere du Loup, and Riviere du Sud; Canadian-Allis-Chalmers Co., for bridges at West River, Barneys River, and French River, N.S.: and to McKinnon, Holmes & Co., for bridges at Beach River, Riviere Le Brass, Sayabee, Ivory, Road and Oxford.

We are officially advised that the contracts cover as follows:—

Dominion Bridge Co., Becancourt River bridge, four 105 ft. deck plate girder spans; bridge at Riviere du Loup, six 105 ft. and two 50 ft. deck plate girder spans; bridge at crossing of National Transcontinental Railway two 52 ft. and four 45 ft. deck plate girder spans; Riviere du Sud bridge, two 65½ ft. through plate girder spans.

Canadian Allis-Chalmers, Toronto, West River, Antigonish, one 88 ft. through plate girder span, and 28 Bethlehem I beam spans, each 22 ft. 3 ins.; bridge at Barney's River east, one 71½ ft. through plate girder; French River bridge, one 89½ ft. through plate girder.

The contracts placed with McKinnon, Holmes & Co., Sherbrooke, Que., are for the following:—Riviere Le Bras bridge, 26 ft. centre to centre, near St. Louise, Que.; Black River bridge, 26 ft. centre to centre, near Sayabee, Que.; the Sayabee bridge, a 32 ft. 8 in. span centre to centre, 2.8 miles west of Sayabee; Ivory road crossing bridge, three spans 24 ft. each, for a roadway 20 ft. wide, supported on longitudinal I beams and two trestle bents, near Nelson, N.B.; Oxford Subway bridge, 20 ft. clear half deck plate girder span, at Oxford, N.S.

Automatic Electric Block Signalling.—As previously stated in Canadian Railway and Marine World, it has been decided to install automatic electric block signalling between the following points:—Halifax and Windsor Jct., N.S., 13.9 miles; Pamtec Jct. and Moncton, N.B., 7.3 miles; Hampton and St. John, N.B., 22 miles. A contract has been given to the Union Switch and Signal Co., the approximate cost being stated as $85,000. The installation is to be completed by June 30, 1914.

Painsec Jct.—Oxford Jct. Second track.—We are officially advised that engineers are in the field making surveys for revising grades, and building a second track between Painsec Jct., N.B., and Oxford Jct., N.S., 70 miles. The survey is aiming at securing a gradient of 0.6 per cent. J. H. Congdon is in charge of the party, and it is expected that the survey will be completed early in the spring.

Telephone Train Dispatching.—We are officially advised that a contract has been let to the Hall Switch and Signal Co., for the erection of a telephone train despatching line between Moncton and St. John. N.B., at an estimated cost of $10,371.90.

Grade Crossings in Moncton.—A proposition has been laid before the Moncton, N.B.,

City Council with a view of eliminating the level crossings in the city. F. P. Gutelius, General Manager, Government Railways, explained the project at a meeting of the Moncton Board of Trade, Nov. 4, and it came before the city council, Nov. 7. The cost of $100,000 is immediately available. The work would include the building of a subway on Main St. and bridges at five other points. The city council, Nov. 12, gave a general approval of the plans, asked for a couple of additional subways, and some other modifications, and appointed a committee to confer with Mr. Gutelius. At a meeting of the City Council, Nov 28, a resolution was passed stating that the written proposals submitted were not in accordance with the plans outlined by Mr. Gutelius, and that they be not concurred in. (Oct., pg. 475.)

The Rogers Pass Tunnel, Canadian Pacific Railway.

Preliminary work for the construction of the tunnel through Mt. Macdonald in the Selkirk Range for the C.P.R., considerable information about which has already been published in Canadian Railway and Marine World, is now well advanced. About 350 men are engaged, and this force will be increased later on to about 500, who will be employed for about four years.

Three camps have been established. Camp 1, at Glacier, B.C., which was described and illustrated in our November issue, will be the main headquarters of the contractors for the work. The second camp is located on the west side, and another is at Bear Creek, 6 miles east of camp 1. At the latter place three steam shovels are in operation, and will continue to be used there throughout the construction of the tunnel. Another shovel will be operated at east side of the hill. The contractors' quarters will include two large buildings, a boiler house and a locomotive house capable of housing four locomotives. The working force will be housed in a 2 storey building 360 ft. by 50 ft. The rooms will be each 12 by 12 ft.

The tunnel will be a trifle over 5 miles long and will have a 1,700 ft. approach on the west side, and a 2,600 ft. approach on the east side. It will lower the grade of the road 545 ft., will shorten the distance by nearly 4 miles; and will practically do away with dangers from snow slides. The portal of the tunnel will be 150 ft. wide by 40 ft., and it will be necessary to excavate 50 ft. before reaching tunnel grade. Before work can be started on the main tunnel, the course of the Illecillewaet River ,for nearly a mile, will have to be changed. In doing this the river will be diverted some 900 ft. to the left of its present course. Over 20,000 cu. yards of concrete will be required for tunnel approaches and the tunnel proper.

Foley Bros., Welch & Stewart, are the contractors. A. C. Dennis, M. Can. Soc. C. E., with headquarters at Glacier, B.C., is in charge of the work for them.

A Passenger on the Quebec and Lake St. John Ry., recently sued the company for $1,000 damages for being put off a train between Limoilou and Lorette on account of his refusal to give up his ticket through not being accommodated with a seat. The judge stated that the fact that plaintiff remained on the train and standing, after being asked for his ticket, was an acknowledgment that he was prepared to proceed on the train, and therefore his ticket was collectible. He, however, awarded him $10 and damages with costs, on account of the conductor putting him off the train between two stations, which was not justifiable.

Anniversary Honors to Dean Galbraith.

As a mark of esteem towards its Dean, John Galbraith, M.A., L.L.D., M. Can. Soc. C.E., on the occasion on which, by a strange coincidence, occurred three important anniversaries of his connection with the University of Toronto, the University of Toronto Engineering Society made him the guest of honor at its annual dinner on Dec. 5. This occasion marked the 50th anniversary of the Dean's entrance to the University as a freshman; the 35th of his connection with the institution of which he is head, first as Principal of the Ontario School of Practical Science, and after the incorporation of the latter into the University with a change in name to the Faculty of Applied Science, as its Dean; and it was also the 25th annual dinner of the Engineering Society, of which he was the first president. The dinner was attended by more than 500 of the alumni, practically from all quarters of the continent.

Dr. Galbraith was born in Montreal, Sept.

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5, 1846, receiving his primary education at the Port Hope Grammar School. Entering the University of Toronto in 1863 he received his B. A. with double scholarship in mathematics and general proficiency, and the gold medal in mathematics, as well as being Prince's prizeman in 1868. He received his M.A. in 1875, and the honorary degree of LL.D. in 1902. In addition, the honorary degree of LL.D. was conferred upon him by Queen's University in 1902. Following graduation, he studied engineering and surveying under G. A. Stewart, Chief Engineer, Midland Ry. (Ontario) subsequently attaining the rank of P.L.S. and D.L.S. He was employed in the building of the Intercolonial Ry., the Midland Ry., and the Canadian Pacific Ry.

On the formation of the Ontario School of Practical Science in 1878, he was appointed to the chair of engineering, as well as being Principal, and when that institution became the Faculty of Applied Science of the University of Toronto, he was given the title of Dean. To him, the old "School," as it is familiarly known by its graduates, owes much of its success, as it was his tireless energy in promoting the welfare of the institution from the early days when a small building and a staff of three comprised his entire charge, to the present day, when there are three large buildings under him with a large staff of instructors and nearly 800 students in the four years.

In the engineering profession at large, he is well known. He was one of the founders of the Canadian Society of Civil Engineers, of which he was for many years a councillor, finally being elected President in 1908. He is also an associate of the Institute of Civil Engineers, England. He was a member of the Royal Committee to investigate the Quebec Bridge failure in 1907.

Railway Finance, Meetings, Etc.

Atlantic, Quebec and Western Ry.—A London, Eng., cablegram states it is understood among the creditors of the Charing Cross Bank, which financed the building of this railway, that the Quebec Government is considering the purchase of the company's bonds which are held by the liquidators of the bank; and that Canadian capitalists have an option on the company's land grants.

Canada Gulf and Terminal Ry. The annual meeting of shareholders was held at Montreal, Nov. 28. Following are the officers and directors for the current year,—President, M. J. O'Brien; Vice President, H. J. Lyons; Secretary-Treasurer, F. W. Rous; other directors, J. A. O'Brien, C. A. Gavreau, A. M. Tessier, G. A. Cote, J. A. Ross and Hon. R. Turner.

Canadian Pacific Ry.—Application is being made to the Dominion Parliament for an act to enable the C.P.R. to guarantee bonds, debentures or other securities of companies in which it may take shares, having for their object the holding of lands, wharves, docks, warehouses, offices, etc., to be used for the purposes of the company or its steamship connections.

Central Ry. of Canada.—A London, Eng., cablegram of Dec. 16 says:—"The Central Ry. Co. of Canada today resolved to retire existing bonds, replacing them by a new issue covering the whole main line between Montreal and Midland. C. N. Armstrong, Vice President, told the bondholders that the railway company was negotiating with an important shipping company which proposes to put a line of steamers on the Great Lakes and from Montreal to British ports. Negotiations are also proceeding with an important new railway from Montreal to the north. Canadian bondholders, Mr. Armstrong added, had never attempted to sell their holding, but they had every confidence in the company's future."

At a meeting of shareholders in London, Eng., Dec. 16, it was resolved to retire all existing bonds in order to make a new issue of bonds covering the whole projected line from Montreal to Georgian Bay. C. N. Armstrong, Vice President, is reported to have stated that bondholders had never attempted to sell their holdings. Negotiations were in progress with another railway for the enlargement of the undertaking, and also with a shipping company which proposed to put a line of steamers on the Great Lakes, and from Montreal to Great Britain, to be operated in connection with the line.

Grand Trunk Pacific Ry.—A press dispatch from London, Eng., states that an announcement was made there recently that an issue of $10,000,000 of seven year 5% notes would be placed on the market at 97, within a few days thereafter.

Grand Trunk Ry.—The Dominion Parlia-

ment is being asked to confirm an agreement between the G.T.R. and the Canada Atlantic Ry. for the amalgamation of the two companies, under the title of the G.T.R. Co., and to authorize the issue by the G.T.R. of such additional amounts of stock as may be necessary for the carrying out of the agreement.

Application is also being made for an act providing for the holding of one annual general meeting a year, and the submission thereto of the accounts for the entire year, instead of half yearly meetings as at present; authorizing the directors to pay interim dividends if thought advisable, and authorizing the creation of an additional amount of 4% consolidated debenture stock, the annual interest charge on which shall not exceed £100,000.

Kettle Valley Ry.—Canadian Pacific Ry. —A duplicate of an agreement between these companies was deposited with the Secretary of State at Ottawa, Nov. 22.

Stanstead, Shefford and Chambly Ry.—Following are the officers and directors for the current year:—Chairman, E. J. Chamberlin; President, S. W. Foster; Vice President, E. C. Smith; Secretary and Treasurer, G. E. Robinson; Assistant Secretary and Treasurer, W. H. Chaffee; other directors, W. Wainwright, G. C. Jones, G. Stevens and J. P. Noyes.

Temiscouata Ry.—Net earnings for October, $2,161. Aggregate for four months ended Oct. 31, $15,095.

Timiskaming and Northern Ontario Ry.—The Ontario Government has received $250,000 from the Treasurer of the T. and N.O. Ry. representing the net earnings for the financial year, less an amount reserved for working capital. For 1912 the Government received $510,000 and in 1911 $515,000 from this source. The decrease in the net earnings is due to decreased freight traffic, owing to smaller ore and coal shipments, reduction in mining royalties, and increased working expenses.

The Ontario Government has received payment of $2,134,000, the subsidy voted by the Dominion Parliament.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Nov. 14, $1,075,202, against $1,098,822 for same period 1912.

Railway Cartage Charges on Eastern Lines.—In connection with the arrangement by which the railway companies recently gave notice that giving cartage service as hitherto, would expire on Oct. 1, 1913, the Board of Railway Commissioners gave a hearing to a number of the eastern boards of trade, during December, at which the railway companies definitely announced that they would not continue the cartage service under the terms and conditions prevailing. It was announced Dec. 18, that the railway companies, in view of the urgent demand of the merchants in different sections of the country, and their voluntary offer through the boards of trade to pay the exact cost of cartage, would continue the present cartage arrangements until further notice.

G. T. Pacific Ry. Regina-Minneapolis Route.—Negotiations are reported to be in progress between the G.T. Pacific Ry., the Great Northern Ry. and the Chicago, Burlington and Quincy Ry., for the establishment of a through service between Regina, Sask., and Chicago, via Minneapolis. The run would be over the G.T. Pacific Ry. from Regina to the International boundary, over the Great Northern Ry. to Minneapolis, thence over the C.B. and Q. Ry. to Chicago. In the event of the arrangement being made the new service will, it is said, be started in the spring.

Steam Railway Track Laid in 1913.

In pursuance of its annual practice Canadian Railway and Marine World issued circulars on Dec. 1, to all railway companies in Canada, asking information as to new track laid during 1913. The following table gives a preliminary statement of the new track laid. In a number of cases the figures given have been estimated either by the railway companies, or in our own offices, pending the receipt of the final figures for the year. Estimated figures are distinguished by an asterisk. The total new single track laid, 3,358.50 miles, is largely in excess of previous years, the figures for 1912 being 2,179.09 miles, and for 1911, 1,851.98 miles.

	Miles.	Miles.
Algoma Central Ry.—		
Oba to Hearst, Ont.		49.00
Algoma Eastern Ry.—		
Mileage 79 to Little Current, Ont.		6.57
Canadian Northern Ontario Ry.—		
Between Montreal and Hawkesbury	10.00	
Between Ottawa and Capreol	120.00	
Between Ruel and Port Arthur	406.00	
Between Sydenham and Ottawa	54.00	
		590.00
Canadian Northern Ry.—		
Manitoba—		
Greenway extension	15.33	
Oakland extension	11.48	
Gross Isle extension	22.80	
Deerfield spur	12.50	
Saskatchewan—		
Delisle Jct. westerly	31.48	
Delisle southerly	5.61	
Swift Current line	55.85	
Prince Albert-Battleford line	51.95	
Moose Jaw extension	1.85	
Battleford north westerly	17.10	
Alberta—		
Main line to Yellowhead Pass	143.31	
Onaway north westerly	30.40	
Saskatoon-Calgary line	26.09	
Vegreville-Calgary line	12.64	
Brazeau line	42.57	
		480.96
Canadian Northern Pacific Ry.—		
Yellowhead westerly	5.00	
Cisco to Hope	62.00	
Portions between steel bridges, Cisco to Kamloops	9.00	
Cottonwood to Kamloops	123.00	
New Westminster to Steveston	12.00	
		211.00
Canadian Pacific Ry.—		
Campbellford, Lake Ontario and Western Ry., Glen Tay to Agincourt, Ont.	182.60	
Manitoba—		
Snowflake west	10.00	
Virden-McAulay line	23.00	
Boissevain-Lauder line	35.00	
Saskatchewan—		
Estevan north west	47.00	
Kerrobert north east	22.00	
Swift Current-Bassano	60.80	
Weyburn-Stirling line	162.00	
Alberta—		
Suffield south west	32.30	
Gleichen-Shepard	25.00	
*Alberta Central	40.00	
Lacombe branch extension	8.00	
British Columbia—		
Kootenay Central extension	19.70	
Whitewater to Kalso	16.00	
		683.40
***Dominion Government Ry.—**		
To Hudson Bay Pass and mileage 130, Man.		130.00
Esquimalt and Nanaimo Ry.—		
McBride Jct. to Big Qualicum	15.80	
Osborne Bay Jct. to Crofton	3.20	
		19.00
Edmonton, Dunvegan and B.C. Ry.—		
Mileage 23 to Mirror Landing, Alta.		88.00
Fredericton and Grand Lake Coal and Ry. Co.—		
Mileage 11 to 24, N.B.	13.00	
Marysville Jct. to Marysville	2.84	
		15.84
***Grand Trunk Pacific Ry.—**		
Main Line in B.C.	180.00	
Branch lines in Manitoba, Saskatchewan and Alberta	420.00	
		600.00
Intercolonial Ry.—		
Georges River to Sydney Mines		9.80
***Kettle Valley Lines—**		
On several sections		50.00
National Transcontinental Ry.—		
In Province of Quebec	88.26	
In Province of Manitoba	2.22	
		90.48
***Pacific Great Eastern Ry.—**		
North Vancouver		3.00
Quebec Central Ry.—		
St. Sabine to St. Camille		5.00
St. John and Quebec Ry.—		
Gagetown to Fredericton, N.B.	29.00	
Fredericton northerly	18.00	
Mileage 21 south of Woodstock to Woodstock, N.B.	21.00	
Woodstock northerly	24.00	
		92.00
Sydney and Louisburg Ry.—		
Morien Jct. to Morien, N.S.	2.00	
Waterford Lake to Colliery 17	1.00	
		3.00
Timiskaming and Northern Ontario Ry.—		
Montreal River to Elk Lake, Ont.	6.00	
Iroquois Jct. to Iroquois Falls	6.40	
		12.40
Vancouver, Victoria and Eastern Ry.—		
Kilgard to Sumas Landing		5.05
Total		3,344.50

In addition to the above new lines the C.P.R. laid second track as follows:

	Miles.	Miles
*Quebec—Farnham section		3.00
Ontario—Islington to Guelph Jct.		29.00
Manitoba—Bergen north east		20.00
Manitoba—Kemnay-Virden		35.00
Saskatchewan—Whitewood-Grenfell		8.00
Saskatchewan—Indian Head-Regina		21.60
Saskatchewan—Regina-Pasqua		12.00
Saskatchewan—Caron-Java		66.70
British Columbia—Ruby Creek to Hammond		59.00
		254.30

The Toronto Hamilton and Buffalo laid second track on 5.90 miles from Welland to Fenwick, Ont., and the Vancouver, Victoria and Eastern Ry. 7.12 miles from Ardley to Still Creek, B.C., making a total of 267 miles of second track laid during 1913.

On the Minneapolis, St. Paul and Sault Ste. Marie Ry., a C.P.R. subsidiary line in the United States, 97.35 miles of track was laid as follows:—

	Miles.
Ambrose, N.D., to Whitetail, Mont.	85.78
Ironhub, Iron Mountain, Minn.	8.21
Range Jct. to Riverton, Minn.	3.36
Total	97.35

The Detroit and Huron Ry., a subsidiary of the G.T.R. in the United States, laid 14.50 miles of track, from near Cass City, to Bad Axe, Mich., 14.25 miles, and from West Bay City to Bay City Terminal, Mich., 1.25 miles.

Passenger Meetings at Buffalo.—The annual meetings of the Niagara Frontier Summer Rate Committee and the Great Lakes and St. Lawrence River Rate Committee will be held at the Lafayette Hotel Buffalo, N. Y., in January. The rate representatives of the Niagara Frontier committee will meet on January 20 and 21 at 9 a.m. for compilation of fares, etc., and the full committee will meet on January 22 at 10.30 a.m. The Great Lakes and St. Lawrence River Rate ing. The International Water Lines Passenger Association will meet on Jan. 21, at 4 p.m.

Calgary Storage Elevator.—The Minister of Trade and Commerce announced at Ottawa, Dec. 12, that tenders would shortly be called for the construction of a Government owned interior storage elevator at Calgary, Alta. It is said to be intended that construction shall commence as early as possible in the spring, that the capacity will be about 2,500,000 bush., and that the type to be followed is that which was adopted for similar elevators at Moose Jaw and Saskatoon.

The Dominion Government telegraph line between Vancouver and Newport, B.C., the terminus of the Pacific Great Eastern Ry., has been completed and opened for commercial business.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—Press reports from Edmonton, Alta., dated Dec. 4, state that two engineering parties are in the field completing location surveys for the line. Construction will be started, it is stated, at a point on the line of the Edmonton, Dunvegan and British Columbia Ry., 12 miles north of Edmonton. J. D. McArthur, Winnipeg, will build the line. (Dec., 1913, pg. 573.)

Alberta Metropolitan Ry.—We are officially advised that right of way plans have been approved for about 16 miles of this projected railway, and that it is expected to build this year about five miles from the Calgary city limits, through Calgary Jct., to connect with the C.P.R. Ogden shops. A contract for four miles of grading has been let to the Dominion Co-operative N. T. and Realty Co., Calgary, and this is nearly completed. The company has an authorized capital of $500,000, the directors being:—W. H. Clapperton, Toronto; W. J. C. Madden, W. T. D. Lathwell, R. P. Madden, Calgary. (Dec., 1913, pg. 592.)

Alberta, Peace River and Eastern Ry.—A general meeting of shareholders was called to be held at Edmonton, Alta., Dec. 29, to consider matters relating to the construction of the line. Lord Farrar, London, Eng., is President. (Dec., 1912, pg. 604.)

H. Muskett King, Vice President, and H. H. Williams, Chief Engineer, who have been in England for some time are expected in Edmonton about Dec. 31. A recent cablegram stated that the meeting of shareholders called to be held in Edmonton, Dec. 29, would be adjourned to London, Eng., where the stockholders reside. The cablegram also said that financial arrangements have been completed for starting construction early in the year.

All Red Line Ry.—In connection with this projected railway in Canada, the associated British interests are promoting the building of a line to connect existing railways in Ireland with Black Sod Bay, from which point it is proposed to run steamships to the Newfoundland coast, or to the starting point of the Canadian line. A contract is reported to have been signed in London, Eng., for the building of wharves and other harbor works at Black Sod Bay. H. C. Long, Boston, Mass., is said to be engineer in charge of the work. (Dec., 1913, pg. 579.)

It is reported in a press dispatch from Prescott, that the principal promoter of this railway project in Canada is F. A. Knapp; that the company will be capitalized at $100,000,000, and that large New York and London, Eng., financial interests will be associated with the project. Mr. Knapp is a barrister formerly living in Toronto, and was the inventor of the Knapp roller boat, built in Toronto, about 15 years ago, which did not prove a success.

Bassano to Richmond, Alta.—We are officially advised that the press reports to the effect that a light railway was to be built under the recent Light Railways Act of the Alberta Legislature, from Bassano through the Irrigation Block to Richmond, by a subsidiary of the C.P.R., are entirely without foundation. (See Alberta proposals for Light Railways, Dec., 1913, pg. 573.)

Burrard Inlet Tunnel and Bridge Co.—At a meeting of directors in Vancouver, B. C., Dec. 3, it was reported that the Provincial Government had under consideration the question of taking over the charter and building the bridge as a provincial work. Representatives of certain of the municipalities urged that the directors should invite tenders at once on the plans prepared by the company's consulting engineer. The plan suggested by certain interests to the Provincial Government is of a different type to that proposed by the company, and is estimated to cost $1,000,000. (Dec., 1913, pg. 573.)

Application is being made to the Dominion Parliament for an extension of time for the building of its authorized lines of railway, bridge and tunnel at Vancouver, B. C.

Central Provinces Ry.—The Saskatchewan Legislature has incorporated a company with this title to build the following lines:—From Regina southeasterly to the eastern boundary of the province between townships four, five and six; from Regina northwesterly to townships 27, 28 or 29, ranges 4, 5 or 6, thence northerly to Saskatoon; from Regina northerly to Prince Albert, and from Saskatoon northeasterly to the eastern boundary of the province between townships 52, 53 or 54. The provisional directors are:—J. D. McArthur, W. P. McDougall, D. W. Campbell, R. A. Hazelwood, J. K. McLellan.

Dominion Atlantic Ry.—We are officially advised that a contract has been let to Kirk and Cook, North Sydney, N.S., for building a line from Centreville Jct., on the Cornwallis Valley branch, to Weston, N.S., 14.79 miles. It is proposed to build a line from Sissiboo Falls to Weymouth, 8.5 miles, but the plans for this have not yet been approved. G. G. Hare, Kentville, N. S., is Engineer. (Oct., 1913, pg. 475.)

Edmonton, Dunvegan and British Columbia Ry.—Edmonton press reports state that it is expected to have a regular train service in operation from Edmonton to Narrow Landing, on the Athabasca River, early in January. (Dec., 1913, pg. 573.)

Gananoque and Arnprior Ry.—Application is being made to the Ontario Legislature for authority to build a branch from the projected main line between Gananoque and Arnprior, Ont., in the township of Rear of Leeds and Lansdowne to Ottawa. J. C. Judd, Ottawa, is the solicitor. The company was incorporated in 1913 to build a railway to be operated by steam or any other motive power from Gananoque to Arnprior, Ont. The provisional directors are:—G. E. Fauquier, J. C. Judd, W. T. Sampson, W. J. Gibson, F. B. Taber, D. W. Green, J. Kenny.

Ha Ha Bay Ry.—The Quebec Legislature has extended the time for the building of previously authorized lines, and for building a branch line from a point on the existing line to the St. Maurice River, following the height of land. (Dec., 1913, pg. 575.)

Joliette and Lake Manuan Colonization Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of the projected lines from Joliette to the G.T. Pacific Ry., and from Joliette to Montreal, Que. Beament and Armstrong, Ottawa, are the solicitors. (Aug., 1912, pg. 412.)

Kettle Valley Lines.—J. J. Warren, President, who was in Victoria, B. C., in conference with the Provincial Government, in connection with the construction of the line, Dec. 3, is reported as stating in an interview as follows:—Beginning at Midway, the present western terminus on the line, 75 miles of steel have been laid westerly to the summit between the Kettle River and Okanagan Valleys. A small trestle is being erected there, and on its completion track will be laid to Canon Creek, mileage 83. A number of trestles have to be built in the Canon Creek district, which will delay track laying in that vicinity until the spring. The grading is finished, with the exception of some cuts and one tunnel, through to Penticton. This work it is expected to have completed and ready for track laying by Mar. 1. It was expected to have about 15 miles of steel laid easterly from Penticton by Dec. 31, leaving 35 miles to be laid to connect with the track end at mileage 75. Track has been laid 30 miles westerly from Penticton, and was expected to have been laid to Osprey Lake, 10 miles farther on, by Dec. 31. Very little work has been done between Osprey Lake and Otter Summit, mileage 105 west of Penticton, the location not having been finally approved. As soon as the route has been settled, a contract will be let, and the work completed, it is expected, by the fall. The line is in operation from Otter Summit to Merritt, 30 miles. At Coldwater Jct., 25 miles south of Merritt, the line branches off in the direction of the Coquihalla Summit. On this section 13 miles of grading have been completed, and 11 miles of steel have been laid. Between the Coquihalla Summit and the Fraser River, McArthur Bros. have over 1,000 men at work. The work of building the bridge across the Fraser River at Hope, to connect with the C. P. R., is well in hand, and it is expected to have it completed by the end of the year. At Merritt, where connection is made with the Nicola, Kamloops and Similkameen Ry., a C. P. R. branch, spur lines will be built during this year or next to give connection with the coal mines. The divisional shops and other buildings have been completed. (Dec., 1913, pg. 574.)

Lake Erie and Northern Ry.—Construction on this line between Brantford and Galt, and Brantford and Port Dover, Ont., was suspended Nov. 28. W. P. Kellett, Chief Engineer, subsequently went to Montreal, and on his return stated that arrangements were being made to resume work shortly. The only place where work did not cease was in Brantford at Lorne Bridge. Near this point there is some difference with the city as to the protection of the terrace. G. A. Mountain, Chief Engineer of the Board of Railway Commissioners, was in the city, Dec. 10, in consultation with the City Engineer and Mr. Kellett on the matter, and a satisfactory understanding was reached. (Dec., 1913, pg. 574.)

Lake Huron and Northern Ontario Ry.—The old Bruce Mines and Algoma Ry. built a line from Bruce Mines, Ont., for about 13 miles northerly to some copper mines, and grading was completed for some six miles beyond that point, before it fell into financial difficulties. The property of the old company was sold, and the purchasers obtained incorporation under the above title from the Ontario Legislature, with power to extend the line to the National Transcontinental Ry. Press reports state that work has been started cleaning up the six miles of grading done beyond track end. It is expected that plans for the extension of line northerly to the N. T. Ry. will shortly be submitted for approval by the Board of Railway Commissioners. (July, 1913, pg. 331.)

Moncton and Northumberland Strait Ry.—We are officially advised that preliminary surveys have been completed for the projected line from Buctouche to Loggieville, N. B., and the location survey from Buctouche to St. Louis, 27 miles. It is expected to have the location survey, together with the profiles of all the bridge sites, borings of the

rivers, lay outs, etc., required by the Board of Railway Commissioners, completed by Feb. E. G. Evans, Hampton, N. B., is Chief Engineer. (Dec., 1913, pg. 574.)

Montreal and Lake Victoria Ry.—The Dominion Parliament is being asked to extend the time for the building of the line authorized by chap. 122 of the Statutes of 1912. E. Rodier, Montreal, is Secretary. (June, 1913, pg. 301.)

Montreal and South Western Ry. and Power Co.—The Quebec Legislature is being asked to extend the time within which the company may start construction of the works authorized by chap. 82 of the statutes of 1911. The company has power, among other things, to build a railway to be operated by steam, electricity or any other motive power in the counties of Laprairie, Beauharnois, Huntingdon and Caughnawaga, and particularly from Adirondack Jct., on the C.P.R., to the international boundary at St. Francis; from Adirondack Jct., on the New York Central Ry., to Dundee, in Huntingdon county. H. A. Beique, Montreal, is solicitor. (June, 1911, pg. 557.)

Pacific and Hudson Bay Ry.—We are officially advised that survey work has been completed for the present, that arrangements are being made to start construction on the first 30 miles of the line early in the spring, that route maps have been filed, and that arrangements have been made for securing the right of way for the greater part of the contemplated construction. The portion of the right of way for which negotiations are in progress is that through the Bella Coola Indian Reserve. (May, 1913 pg. 220.)

Pacific Great Eastern Ry.—It is expected that a train service will be put in operation between North Vancouver and West Vancouver, B. C., Jan. 1; and by June 1, as far as Horseshoe Bay, near Newport. The lines being operated from Newport for about 12 miles, and it is expected to be able to run trains as far as Lillooet by the fall, and to have the entire line to Fort George completed by the end of 1915. It is not intended to have the piece of line along Howe Sound into Newport completed until 1915, as there is a water route between Vancouver and Newport, which can take care of the existing traffic.

The company is negotiating with the Provincial Government with a view to securing a considerable area of the tide flats at Newport, reclaiming them for railway purposes. Dec., 1913, pg. 574.)

Prince Edward Island Ry.—The line to be built to Carleton Point in connection with the carferry terminals under construction there, will start from the existing line about 1.5 miles from Cape Traverse. It will be about three miles long. Construction will, we are officially advised, probably be gone on with at once. (Dec., 1913, pg. 574.)

Quinze and Blanche River Ry.—We are officially advised that this railway was built only for a very short distance from the Quinze River, a tributary of the Ottawa River, to Quinze Lake, Que. It was built as a lumbering line, but is not now being operated. (July, 1913, pg. 481.)

The Dominion Parliament is being asked to extend the time for the building of the railway authorized by chap. 123 statutes of 1906-07, as amended by chap. 27, statutes of 1908-09, and to confirm the section already built, or partially built, between the Devil's Eddy at the Third Chute of the Des Quinze River and the head of navigation on Lake Timiskaming. Orde, Powell and Lyle, Ottawa, are solicitors for applicants.

Regina and Saskatoon Ry.—The Saskatchewan Legislature is being asked to incorporate a company to build a railway from Regina to Saskatoon, Sask. Anderson, Bagshaw and Amyot, Regina, are the solicitors.

Roberval-Saguenay Ry. — The Quebec Legislature has granted an extension of two years within which that company may build its projected lines; and has authorized the building of a line of 250 miles, from the Ha Ha Bay Ry., to the St. Maurice River. (Dec., 1913, pg. 575.)

Saskatchewan Central Ry.—The Dominion Parliament is being asked to grant an extension of time for the construction of the lines authorized to be built by chap. 160 of the Statutes of 1910. Smith and Johnston, Ottawa, solicitors. (June, 1913, pg. 302.)

Shefford, Bagot and Missisquoi Ry.—Application is being made to the Quebec Legislature for the incorporation of a company with this title, to build a railway from the International Boundary, between Quebec and Vermont, in the parish of St. George, to a junction with the Intercolonial Ry. between Bagot and St. Eugene, in Bagot County, and to build a branch line from Adamsville to the parish of St. Armand, and another from Roxton pond to Richmond. J. E. Runnels, Worcester, Mass., is Chief Engineer.

The provisional directors are W. H. Robinson, Granby, Que.; A. R. McMaster, Montreal; J. G. Gibson, Dunham, Que.; A. W. Runnells, Springfield, Mass.; J. E. Runnells, Worcester, Mass.

Simcoe, Grey and Bruce Ry.—Negotiations are reported to be in progress between the company and the G. T. R., under which the latter proposes to take over the line between Owen Sound and Meaford, Ont., when built. The directors have asked the G. T. R., to give fuller details of its proposals, particularly in regard to what running rights would be given to other railways. Jas. McLaughlin, A. G. MacKay, B. Allen, C. Eaton, Owen Sound, are provisional directors. (See Owen Sound to Meaford, Dec., 1913, pg. 574, and S., G. & B. Ry., Dec., 1912, pg. 605.)

Seward to Yukon.—The Territories Committee of the U.S. Congress reported, Nov. 27, in favor of the Government building and operating a railway from Cordova or Seward, on the Alaskan Pacific Coast, to the Upper Yukon River, 722 miles.

Timiskaming and Northern Ontario Ry.—The plans and specifications for the reconstruction of the line from North Bay to New Liskeard, are reported to be fully prepared, and is expected that now the Dominion Government has paid over the subsidy amounting to $2,134,080 voted last session, the Provincial Government will authorize the Commission to go ahead with the work.

Toronto, Hamilton and Buffalo Ry.—The Board of Railway Commissioners has decided that it has full authority to issue an order to compel the company to divert its present entrance into Hamilton, via Hunter St., and to adopt in conjunction with the G. T. R., and the Canadian Northern Ry., a common location in the north end of the city. The city desired the company to eliminate level crossings, and the company proposed to do this by elevating its tracks. The city said this would be much more costly than depressing them, which the company refused to consider. Then the city put forward a plan for common entrance into the city for the T. H. and B. Ry., and the C. N. R. The company claimed that the Board of Railway Commissioners had no power to order it to move from its existing location, although it might order the tracks to be either elevated or depressed. (Dec., 1913, pg. 575.)

Toronto, Barrie and Orillia Ry.—At a special meeting of the Barrie, Ont., Town Council recently a resolution was passed approving a provisional agreement granting the Toronto, Barrie, and Orillia Ry. Co. a 25 years franchise for building an electric railway in the town, the company's assessment for general taxation to be fixed at $15,000. The company proposes to build a line of about six miles from near Utopia or Midhurst stations on the C. P. R. Toronto-Sudbury line into and through Barrie. Construction will, it is said, be started in April, and completed by Sept., 1915. A by-law approving of the agreement will be voted on by the ratepayers at the municipal elections, Jan. 5.

Victoria, B.C.—The rails recently required by the Victoria, B.C., City Council, were for building a railway on the pipe line grade for the new water supply. The pipe line will have a length of 27.5 miles from the Humpback reservoir to Sooke Lake, along the mountain side. The railway is to be used for transporting concrete pipe and other materials. The gauge is 2 ft., and the gradient 1 ft. in 1,000. There are a great many curves, and several high trestle bridges have had to be built. Part of the line is in operation. C. H. Rust, City Engineer and Works Commissioner, has charge of construction.

Wabash Rd.—Negotiations have been opened with the London, Ont., City Council by the Wabash Rd., for running rights over the London and Port Stanley Ry., from St. Thomas to London, Ont.

The "Right Side" for Traffic in British Columbia.—This question was discussed at a meeting of the Progress Club at Vancouver, Dec. 10, particularly as it affects the British Columbia Electric Ry. At present this railway operates its line according to the British rule of the road, under which vehicle traffic of all kinds keeps to the left. The club advocates the making universal of the rule of the road as used throughout the United States and some parts of Canada. F. R. Glover, representing the company, while sympathizing with the suggestion pointed out that the change would have to be made in one night. The entire line and rolling stock were constructed for left hand operation, and it would be a most expensive matter to make the change. A full four way crossing would cost $22,000, and as the number of such and other crossings on the line is large, the cost of changing the track would be about $290,000. It would take a year to change the cars, and the cost would be about $300,000, to say nothing of the inconvenience that would be caused by the withdrawal of cars to be altered. To purchase new rolling stock for the mainland lines would cost $2,471,000. The other expenses might run to $650,000. It would, therefore, be easily seen that the suggested change would be a most expensive one to the company.

The Quebec Industrial Co.—Application is being made to the Quebec Legislature for the incorporation of a company with this title with a capital of $2,000,000 and offices in Quebec. The powers asked include, according to a statement made to the Legislature, "everything in the industrial and commercial calendar except banking and insurance." Among the things which it is specifically mentioned the company desires to do is to build or acquire docks, wharves, warehouses, elevators, etc., to build railways, and to carry on an express business. The provisional directors are: E. Roy, R. Langlois, O. Morin, advocates, Quebec.

The Quebec and Saguenay Ry. Co. applied in the Quebec courts recently for the dismissal of an ex parte motion for judgment in favor of M. J. O'Brien and others, the contractors, for building the line, amounting to $839,511.18. The application was refused.

Railway Rolling Stock Notes.

The G.T.R. is in the market for 110 passenger cars, 500 flat cars and 500 stock cars.

The Pacific Great Eastern Ry. is reported to have ordered two motor cars in San Francisco, Cal.

The Intercolonial Ry. has received 5 consolidation locomotives, nos. 266 to 270, from Montreal Locomotive Works.

The G.T. Pacific Ry. has received two colonist cars, nos. 3038 and 3039, from the Canadian Car and Foundry Co.

The G.T.R. has ordered 500 steel frame stock cars, and 10 steel frame baggage cars, from National Steel Car Co.

The Pacific Great Eastern Ry. has ordered 44 steel frame box cars, and 67 steel underframe flat cars, from National Steel Car Co.

The Minneapolis St. Paul and Sault Ste. Marie Ry. has ordered 6 passenger cars, 2 parlor cars and 2 buffet observation cars, from Barney and Smith Car Co.

The Intercolonial Ry. has ordered 200 box cars and 20 vans, from Nova Scotia Car Works; and 6 consolidation and 5 switching locomotives, from Canadian Locomotive Co.

J. D. McArthur and Co., contractors for the Dominion Government railway to Hudson Bay, are reported to have ordered six mogul locomotives from Canadian Locomotive Co.

The C.P.R., between Oct. 31 and Nov. 30, ordered the following rolling stock from its Angus Shops,—12 steel baggage and express cars, 25 steel first class cars, 3 horse express cars, 60 ft. long, and 1 horse car, 72 ft. long.

The Union Carbide Co. of Canada has ordered one four wheel saddle tank locomotive, with cylinders 15 by 24 ins., 44 ins. driving wheels, and weight in working order, 44 tons, from Canadian Locomotive Co., for delivery in February.

The British Columbia Equipment Co. has ordered one four wheel saddle tank locomotive, with cylinders 10 by 14 ins., 28 ins. driving wheels, and weight in working order, 14 tons, from Canadian Locomotive Co., for delivery during January.

The Canadian Northern Ry., between Nov. 13 and Dec. 12, received the following additions to rolling stock,—4 cabooses, from its Winnipeg shops; 125 box cars and 3 snow ploughs, from Canadian Car and Foundry Co., and 20 box cars, from National Steel Car Co.

The Confederation Construction Co. has ordered one four wheeled saddle tank locomotive, with cylinders 13 by 18 ins., 36 ins. driving wheels, and weight in working order, 30 tons, from Canadian Locomotive Co., for delivery during January, for use on its Welland Ship Canal contract.

Morley Donaldson, Vice President and General Manager, G.T. Pacific Ry. is reported to have stated recently, that the company was taking up the question of oil fuel for locomotives, and that he expected within two years, locomotives consuming oil fuel would be in operation on the Mountain Division.

The G.T.R. has received 18 mikado locomotives, 63in. wheels, nos. 570 to 587, from Montreal Locomotive Works; 691 box cars from Canadian Car and Foundry Co.; 313 box cars from Eastern Car Co.; 479 box cars from Western Steel Car and Foundry Co., and 286 gondola cars from Pressed Steel Car Co.

The Canadian Locomotive Co. has recently delivered 18 ten wheel locomotives, class M3d, with cylinders 23 by 26 ins., 188,600 lbs. weight in working order, completing an order of 25, to the C.P.R.; and 5 six wheel switching locomotives, class O—10b, with cylinders 19 by 26 ins., 124,600 lbs. weight in working order, to the Canadian Northern Ry.

The C.P.R., between Oct. 31 and Nov. 30, received the following additions to rolling stock,—231 steel frame box cars, 2 horse cars, 2 buffet parlor cars, 7 single track flangers, and 3 locomotives class U3, from its Angus Shops; 356 steel frame box cars from Canadian Car and Foundry Co.; 8 locomotives, class D10, from Canadian Locomotive Co., and 366 steel frame box cars, from Barney and Smith Car Co.

The C.P.R. Angus Shops, Montreal, during five weeks last autumn completed 233 new cars, comprising tourist sleepers, diners, freight cars and conductors' vans, and also turned out 7 new locomotives ready for service. If the Angus Shops had no repairs to make, if the entire staff of 7,000 men were available, a complete train could be turned out daily by this plant, which is the largest of its kind in Canada and one of the largest on this continent.

The Intercolonial Ry. has ordered 5 consolidation and 5 switching locomotives, from Canadian Locomotive Co. Following are the chief dimensions,—

	Consolidation.	Switching.
Weight on drivers	208,000 lbs.	....
Weight, total	236,000 lbs.	150,000 lbs.
Wheel base, rigid	16 ft. 6 ins.	....
Wheel base, engine, total	25 ft. 5 ins.	12 ft.
Wheel base, engine and tender	69 ft 11 ins.	40 ft 7 ins.
Heating surface, firebox	207 sq. ft.	157.5 sq. ft.
Heating surface, tubes	1885 sq.ft.	2300.0 sq. ft.
Heating surface, total	2092 sq. ft.	2475.5 sq. ft.
Driving wheels, diar.	63 ins.	51 ins.
Driving wheel centres	Cast steel	Cast iron
Driving journals	10 by 14 ins.	8½ by 11 ins.
Cylinders, diar. and stroke	24 by 32 ins.	21 by 26 ins.
Boiler, type	Straight top radial stay.	
Boiler pressure	180 lbs.	
Tubes, no. and diar.	227—2 ins. 30—5¾ ins.	272—2 ins. 28—5¾ ins.
Tubes, length	15 ft. 2¾ ins.	12 ft. 5 ins.
Brakes	Westinghouse American	
Superheaters	Schmidt type A	
Valve gear	Walschaert	
Weight of tender loaded	140,000 lbs.	90,000 lbs.
Capacity, water	6,500 galls.	3,800 galls.
Capacity, coal	10 tons	6 tons
Tank, type	Water bottom	Sloping back
Truck, type	Outside equalizing	Arch bar
Truck wheels, diar.	34 ins	34 ins.
Wheels, material	W. I. centre steel tired	
Journals	5½ by 10 ins.	4½ by 8 ins.
Brake beams	Steel I section	

Following are chief details of the six-wheel switching locomotive which the Dominion Dredging Co. is having built by the Montreal Locomotive Works, as mentioned in our last issue:—

Cylinder, diar. and stroke	17 by 24 ins.
Tractive power	23,100 lbs.
Factor of adhesion	4.33
Wheel base, rigid	10 ft. 8 ins.
Wheel base, engine and tender	35 ft.
Weight in working order	100,000 lbs.
Weight, engine and tender	155,000 lbs.
Boiler, type	Straight top
Boiler, diar. first ring	54 ins.
Boiler, working pressure	180 lbs.
Firebox, length and width	90 by 34¼ ins.
Crown staying	Radial
Tubes, no. and diar.	180, 2 ins.
Tubes, length	10 ft. 4 ins.
Heating surface, tubes	966 sq. ft.
Heating surface, firebox	121 sq. ft.
Heating surface, total	1,087 sq. ft.
Grate area	21.4 sq. ft.
Wheels, diar.	46 ins.
Wheels, material	Cast iron
Wheels, tender, diar.	28 ins.
Driving journals, Main, 8 by 9 ins.; others	7 by 9 ins.
Tender truck journals	3¾ by 7 ins.
Journal boxes	Cast iron
Brakes	Westinghouse American
Tank capacity	2,500 U.S. gals.
Coal capacity	3 tons

With reference to the 130 passenger cars for which the G.T.R. is in the market, we are officially advised that the number is divided as follows,—67 first class, 25 baggage, 8 mail, 5 combination first class and baggage, 4 dining, 5 parlor, 16 suburban. The cars are to be of steel frame construction 74 ft. over end sills, except the baggage and mail cars which will be 61 ft. over end sills. They will have substantial steel under frames, with sides of steel girders and substantial side sill Z bars and heavy dropper bar under window sills and 3 by 3½ by ⅜ ins. angles for side plates. Steel carlines are to be rivetted to the side plate angles thus making a rigid steel frame construction. The entire vestibules are to be of steel of built up construction, and the width will be increased from 2 ft. 5 ins. to 2 ft. 9¼ ins.; trap doors will be so arranged that they cannot be opened before the vestibule side door has been opened, and grab irons are to be placed on the bottoms of the trap doors as well as on the buffer beams. Each of the cars will be equipped with the Coleman bolster locking device, which was fully described in Canadian Railway and Marine World of Jan., 1913. The insides of the cars will be finished in Mexican mahogany.

Grand Trunk Railway Betterments, Construction, Etc.

Stratford Station and Yards.—The new station at Stratford, Ont., has been practically completed, and the staffs of the several departments have taken up their new quarters. The majority of the tracks in the yard have been rearranged, and have been raised 3 ft. above the old level in the vicinity of the new station, and to meet this the bridge across Wellington St. is being raised. It is not expected, however, to have the entire work in the yards completed until the spring.

Press reports state that plans are being prepared for the building of an additional 20 stalls to the locomotive house, and that work will be started early in the spring.

The Port Huron Shops.—Pending decision as to what is to be done in regard to rebuilding the shops at Port Huron, Mich., a number of men have been transferred to the shops at London, Ont., and others have been moved to Chicago, Ill., where temporary premises have been taken for carrying on some of the work formerly done at Port Huron. (Dec., 1913, pg. 582.)

The Toronto Board of Trade's Traffic Department, of which T. Marshall is Manager, issued recently its Information Series no. 1, which contains very full information about less than carload merchandise freight service and class rates from Toronto, and shows what an excellent service the railways have under schedule. It also contains information with respect to the proper packing, marking and addressing of freight, preparation and presentation of claims, etc., together with the effective class rates. This is the first publication of its kind in Canada, and it will undoubtedly be of considerable assistance in shipping rooms.

Cost of Transcontinental Lines.—J. P. Muller, who testified as an expert before the Board of Railway Commissioners during its recent enquiry into Western freight rates, gave the following figures of capital expenditure on the three transcontinental lines:—Canadian Pacific, total $363,274,900; per mile, $35,126.07. Canadian Northern, total $170,411,188; per mile, $45,669.50. Grand Trunk Pacific, total $110,612,588; per mile, $87,537.66.

It is said that the motor cars on the Toronto Civic Car Lines on the Gerrard St. section cost about $9,500 each and those on the St. Clair Avenue and Danforth Avenue sections about $8,500 each. They were imported from the United States.

National Transcontinental Railway Construction.

We are officially advised that track was laid during 1913, on 88.26 miles in the Province of Quebec, and on 2.22 miles in Manitoba. The line is now completed so far as track laying is concerned, and G. Grant, Chief Engineer, is said to have recently stated that the entire line will be ready for handing over to the G.T. Pacific Ry. for operation, by the end of this year. On the line east of Quebec to the boundary between Quebec and New Brunswick, there is stated to be only about 10 miles of ballasting to be completed. The work of finishing up the line west of Quebec is being pushed forward with all speed. In regard to the velocity grades, which were established east of Bell River, the Chief Engineer is reported as stating that they will be eliminated before long.

The steel bridge work is not yet finished, contracts for four bridges to replace temporary trestle work having just been let to the Canadian Bridge Co. (Dec., 1913, pg 578.)

Grand Trunk Pacific Railway Construction.

A train service is being operated regularly on the main line to McBride, B.C., 413 miles west of Edmonton, Alta. The contractor's work trains are running to the second crossing of the Fraser River, 55 miles beyond McBride. It is expected that track laying will be completed into Fort George early in January, and that the track laying gang working easterly from Prince Rupert will have come within 100 miles of Fort George. The grading is all expected to be completed by June 30.

G. T. Pacific Branch Lines.

The Saskatchewan Legislature has authorized the city of Weyburn to enter into an agreement with the G.T.P. Saskatchewan Ry. for the building of a branch line into the city from the Regina-International boundary branch. The programme for construction during 1914 had not yet been arranged between the Government and the company.

It has been reported to the Saskatchewan Legislature that the surveys for the proposed branch through the territory lying north and west of Moose Mountain, provision for the guaranteeing of bonds for the construction of which has been made by the Legislature, are expected to be completed during the winter. No agreement had been made for the extension of the Moose Jaw Riverside line across the South Saskatchewan River.

The Saskatchewan Legislature has authorized the guaranteeing of the company's securities to the extent of $2000 a mile in addition to the amount already guaranteed, for the construction of the lines named in chap. 4 of the statutes of 1908-09, as amended by chap. 35,.1909, chap. 5, 1909, and chap. 13, 1912, such additional securities to be secured by supplementary mortgages or deeds. It has also authorized the guaranteeing of securities for $1,300,000 in addition to those already guaranteed to provide a railway bridge across the South Saskatchewan River, on the Young-Prince Albert branch and bridges on the Regina-Moose Jaw northwesterly branch, and approaches thereto. The resolutions also provide that the rate of interest guaranteed shall be increased from 4% to 4½%.

A freight service has been put in operation on the line from Regina to Moose Jaw, Sask., and it is expected that a passenger service will soon be operated. On the line northwesterly out of Moose Jaw, track is reported to have been laid to Mawer, 10 miles west of Eyebrow.

Track laying has been completed to the banks of the South Saskatchewan River, on the Young-Prince Albert branch, and sidings laid out. Preparations are being made for the building of a bridge across the river. It is expected that the piers and abutments will be put in during the winter.

The Board of Railway Commissioners has authorized the opening for traffic of the Mountain Park Coal branch, mileage 0 to 30.24. (Dec., 1913, pg. 578.)

The Legislature is further being asked to guarantee the company's 4½% bonds for $15,000 a mile in respect of the construction of the following additional lines:—From a point on the Biggar-Calgary branch to the west bank of the South Saskatchewan River opposite Riverside, 60 miles; from the main line in tp. 36, range 8, west of the third meridian, southwesterly from Saskatoon, 50 miles; from Talmage on the Regina-Boundary branch northwesterly towards Moosomin, 70 miles; and for a 90 mile extension of the Watrous-Swift Current line authorized to be built by par. 2 of the schedule to chap. 14 of the statutes of 1912.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Rates on E'evator Sundries.

20861. Re complaint of Otis-Fensom Elevator Co. against the proposed rating of 6th class for elevator guides, iron or steel, in supplement 2 to Canadian Freight Classification 15, submitted by Canadian Freight Association for approval, it is ordered that the complaint be dismissed.

Rates on British Columbia Lumber.

20912. Nov. 25.—Re complaint of Fullerton Lumber & Shingle Co., of Vancouver, that notwithstanding orders 7277 and 9187, the joint rates on lumber, etc., from stations on the Vancouver, Victoria & Eastern Ry. and Navigation Co.'s line to points in British Columbia, Alberta, Saskatchewan, Manitoba, and Ontario, did not come into force until Sept. 22, 1913, although the C.P.R. rates from Vancouver, on which the said joint rates are based, became effective July 10, 1913. It is ordered: 1. The special eastbound tariff rates from Vancouver, published by the C.P.R. from time to time, to apply to carload shipments of lumber, shingles, and articles taking the lumber and shingle rates, shall, with the addition of not more than 1c. per 100 lbs., apply as joint rates from stations between Vancouver and New Westminster on the Vancouver, Victoria & Eastern Ry. & Navigation Co.'s line (operated by the Great Northern Ry.) to carload shipments of the same articles, to the same points, which are routed via Vancouver or New Westminster and the C.P.R., or the C.P.R. and railways connecting therewith. 2. The Great Northern Ry. shall receive not less than 2½c. per 100 lbs. to Vancouver or New Westminster as its proportion of the said joint rates. 3. The C.P.R. shall furnish the said new rates from Vancouver, together with the regulations and conditions pertaining thereto, to the G.N.R., so that the new joint rates from the said stations of the Vancouver, Victoria & Eastern Ry. and Navigation Co. shall become lawfully effective simultaneously with the new rates from Vancouver to the same points. 4. Orders 7277 and 9187, dated June 16, 1909, and Jan. 7, 1910, are rescinded.

Rating of Peanut Butter.

50925. Nov. 25.—Re application of Toronto Board of Trade, for an order requiring the provision of a carload rating of 4th class on peanut butter in the Canadian Freight Classification. It is ordered that the Canadian Freight Classification be amended by the addition of a rating of 4th Class for peanut butter in carloads, and that the said amendment be included in the proposed Supplement 2 to Canadian Freight Classification 16 submitted by the Canadian Freight Association for the Board's approval.

Demurrage On Coal Shipments.

21011. Dec. 15. Re complaint of Vanguard Co-Operative Supply Co., Ltd., Vanguard, complaining that the C.P.R. wrongfully collected $34 from it as demurrage on two cars of coal consigned to Canadian Coal and Commission Co., Bienfait, and shipped on Dec. 11 and 12, 1912. It is declared that the said charge for demurrage was illegal.

Steam Shovel Track Connection.—Every shovel man knows that much time is needlessly lost in moving up. This loss is sometimes due to the poor organization of the crew, but more often to derailment and other delays due to soft ground and poor track laying. Many methods have been devised for cutting down these accidents by the introduction of various devices for connecting the track ends. The most common method is the ordinary splice bar, which holds the rails together by means of a pair of pins or bolts slipped through holes bored in the rail ends and through each end of the bar. Another device is a pair of angles mounted on a plate and bolted to the tie. A better device, however, is a rail chair. It consists of a steel casting which fits loosely over the end of the rail, its length corresponding to the width of the tie, i.e., 8 in. The casting is bolted to the tie as shown, and is fitted with pins chained to the castings in order to prevent loss.

A Steel Lunch Counter Car was placed in service by the Pennsylvania Rd. recently between New York and Philadelphia on trains which also carry dining cars. The car is 80 ft. long and has, instead of tables, a long mahogany counter extending over half the length of the car, with sufficient capacity to serve 21 people seated on revolving mahogany chairs facing the counter. While the number seated is no greater than in a standard dining car, it is hoped to be able to serve them more rapidly.

Roger Miller & Co., (P. E. I.) Limited, has been incorporated under the Dominion Companies Act, with a capital of $200,000 and offices at Montreal, to carry on business as a general construction and contracting company. The provisional directors named are merely nominal. A contract was let recently by the Department of Railways to Roger Miller and Sons, Toronto, for the erection of car ferry terminals at Carleton Point, P. E. I.

Railway Lands Patented.—Letters patent were issued during October, covering railway lands in Manitoha, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Canadian Northern Ry.	149.30
Canadian Pacific Ry. grants	922.69
Canadian Pacific Ry. roadbed and station grounds	19.98
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	10,881.50
Total	11,973.47

Calgary Stock Yard.—A project for the establishment of a stock yard at Calgary, Alta., has been initiated by the United Farmers of Alberta, of which organization W. J. Tregellis is President. The C.P.R., it is stated, asks to have 51% of the capital allotted to it, hut the U. F. of A. desire to give the three railways now entering Calgary equal interests, the city of Calgary and the farmers having the other interests.

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Change of Canadian Railway and Marine World's Subscription Rates.

When this paper, under its original name of the Railway and Shipping World, was first issued in March, 1898, it consisted of 32 pages, which size was maintained during that year. During the succeeding 16 years it has been gradually increased in size, so that in 1913 it averaged 112 pages an issue, a total of 1,348 pages for the year.

When the Railway and Shipping World was first projected it was intended to be both a newspaper, with up to date news features relating to its field, and a technical paper dealing with engineering, mechanical and other transportation problems. This intention has been fully lived up to, and from a small beginning, with a limited amount of reading matter, it has been gradually built up to its present standard. As business has warranted, the editorial staff has been added to, until to-day's Canadian Railway and Marine World has the largest editorial staff of any technical publication in Canada devoting itself entirely to one publication, and in addition has a number of regular contributors, so that the various engineering, mechanical and other technical subjects are dealt with by experts of experience and acknowledged authority.

The establishment of a transportation paper in Canada in 1898 was looked upon as a risky venture, including some of the most prominent transportation officials, but the founder had every confidence in his ability to make it a success, which has been amply justified by results. The originally expressed intention to make accuracy the leading feature of matter published was very soon appreciated, and has resulted in securing a most thorough circulation among all grades of steam railway, electric railway and steamship officials throughout the Dominion, the result being that to-day there are on the subscription list over 90% of all the officials of those companies. For a number of years the paper has been a thoroughly established and satisfactory property, and as a result it is today much larger and more valuable in every way than in its earlier history. How thoroughly this has been appreciated is shown by the fact that during 1913 the average circulation was 4,341 copies of each issue. How completely this covers the entire Canadian field will be realized from the fact that the average circulation of the leading railway publication in the United States during 1913 was 8,600 copies per issue, as per its own published statement, and that in a field including the whole United States, and with some circulation in Mexico, Canada and other countries. This comparison shows how thorough Canadian Railway and Marine World's circulation is, and justifies the claim that no other transportation publication in any part of the world has so intensive a circulation, in fact that this paper has a very much larger circulation in proportion to the population of its field than any other transportation periodical published anywhere.

In the 16 years during which the paper has been published the cost of production has largely increased. Altogether outside of the facts that the size of the paper has steadily grown, and that editorial and other expenses have been largely added to in order to secure the improvements which have been carried out, the actual cost of printing per page has largely increased, in line with the general advance in prices which has been such a marked feature of the last few years. Since the establishment of this paper printer's wages have advanced over 75%, the prices of paper, ink, etc., have also largely increased. As a result the cost of printing Canadian Railway and Marine World, including typesetting, paper, presswork and binding, is now considerably over double the annual subscription price heretofore charged, and this is exclusive of the cost of illustrations, editorial salaries, office and other business expenses, postage, etc.

In the earlier days of the paper's history, when its size was much less than to-day, and when the circulation was also much smaller, the loss on subscriptions was not a very serious item, but as the transportation interests have developed and the circulation has in consequence increased to its present proportions, the loss on circulation has to be considered. Enquiries which we have made from a large number of subscribers have elicited expressions of most thorough satisfaction with the paper, of surprise that it has been possible heretofore to supply it at so low a price, and entire readiness to pay a more adequate subscription. As a sample of letters received from time to time we may quote one from one of the principal general officers of the Canadian Pacific Railway, who wrote as follows:—"I look upon Canadian Railway and Marine World as THE paper which anyone interested in Canadian railway or marine matters has to take and read in order to be posted. I would not be without it for considerably more than 'the price of admission.'" Another well known railway man, in remitting his renewal subscription recently, wrote:—"I am ashamed to send so small a trifle for so valuable a publication."

After the most thorough consideration it has therefore been decided to make the subscription rate on and after Jan. 1, 1914, $2 a year, including postage to any address in the world. This will still be below the actual cost of printing, outside of other expenses enumerated above. We are confident that in view of the quality of the publication which is being supplied, this change will be very generally acceptable to subscribers, and we can assure them that the extra revenue which will be derived will be expended in still further improving the paper in every way.

The new rate will apply to all new subscribers received on and after Jan. 1, 1914. Subscribers who have not yet paid the current year's subscription will be given the old rate for a year from their last payment date. For example, a subscriber who has paid up to say, June, 1913, will be charged the old rate to June, 1914, after which the new rate will apply.

Nosbonsing and Nipissing Ry.—We are officially advised that this line is no longer in operation, the rolling stock having been removed and the track taken up during last summer. It was a logging railway, 5.50 miles long, connecting Lakes Nosbonsing and Nipissing, crossing the G. T. R. line to North Bay, in Ferris Tp., and was owned by J. R. Booth, Ottawa.

G. M. Ross, Agent, C.P.R., Summerland, B.C., writes: "Enclosed find express order for one year's subscription to Canadian Railway and Marine World. My late father, D. G. Ross, always had it in his home, and I am sure it is the best means of keeping up to date about railway matters generally."

J. W. Porter, acting Chief Engineer, Hudson Bay Railway, Winnipeg, writes: "I have been a subscriber to Canadian Railway and Marine World for some time, and like many others get a great deal of pleasure, as well as information, from reading your interesting and accurate paper."

Canadian Pacific Railway Construction, Betterments, Etc.

Eastern Division.—The work of putting up the train sheds at Windsor St. station, Montreal, is practically completed. There is a good deal of work yet to be done at the old building in order to bring it in character and design in harmony with the new extension.

Campbellford, Lake Ontario and Western Ry.—Track laying has been completed from Glen Tay to Agincourt, Ont., 182.6 miles. The line starts from Glen Tay, 15.7 miles west of Smiths Falls, to which point the C.P.R. line from Montreal is double track, and running down to the lake shore at Belleville, runs south of the G.T.R. to Port Hope, and then strikes northwesterly to a junction with the C.P.R. Montreal-Toronto line at Agincourt, 12.8 miles east of Toronto. From this point on to Toronto a second track is being built. The distance from Montreal to Toronto by the old route is 338.5 miles, and by the new one 341.1 miles. A freight service is being put on at once, but it is not intended to operate a passenger service over the new line until the summer. The stations on the new line are:—Christie Lake, Crow Lake, Parham (junction with the Kingston and Pembroke Ry.), Wilkinson, Overton, Lonsdale, Shannonville, Belleville, Trenton, Brighton, Colborne, Grafton, Cobourg, Port Hope, Newtonville, Newcastle, Bowmanville, Oshawa, Whitby, Cherrywood.

Ontario Division.—In connection with the building of the viaduct in Toronto, the C.P.R. is considering the desirability of putting all its telegraph wires on lines entering Toronto, underground.

The second track between Islington and Guelph Jct., 29 miles, has been completed, and trains are being regularly operated over it. The rearrangement of the station yards at Streetsville is being gone on with, and is expected to be finished early in January. The only piece of the second track between Toronto and Guelph Jct. not completed is at the bridge across the Humber River. The plans for the reconstruction of this bridge as a double track one have been approved, and it is expected that construction will be gone on with during the year.

We are officially advised that no work is being done in or around Collingwood, Ont., by the C.P.R., preparatory to any new construction. Recent press reports stated that some work had been started at Collingwood, which was understood to be in preparation for the projected Collingwood Southern Ry. to Baxter, on the Toronto-Sudbury line.

Lake Superior Division.—The Board of Railway Commissioners has authorized the opening for traffic of a portion of the deviated line at bridge 39.49, North Bay Subdivision.

Manitoba Division.—Construction of the yards at North Transcona, six miles east of Winnipeg, is being steadily progressed with. When completed, they will have 159 miles of trackage, sufficient to handle 12,000 cars. The plans at present being carried out are for track accommodation to handle 2,000 cars. The yards will have two locomotive houses, each 425 ft. outside diameter, with a 108 ft. turntable, and between the two will be a 100,000 gall. water tank. A double track line has been provided for these yards, extending from Bergen northeasterly and rejoining the main line at or near Whitewater, on which 20 miles of second track was laid during 1913.

Track has been laid for 10 miles on a branch line starting from Snowlake, and running west just north of the international boundary.

The Board of Railway Commisisoners has authorized the opening for traffic of the Boissevain-Lauder branch, 36.4 miles. Track was laid on this branch during 1913 for 35 miles.

A second track has been laid on the main line from Kemnay to Virden, 35 miles. The branch line from Virden, northeasterly, which heretofore extended 13 miles, has been extended to McAuley, on the Kirkella-Langdon line, 23 miles of track being laid in 1913. This line was opened for traffic early in December, the speed of trains being limited to 20 miles an hour.

Saskatchewan Division.—During 1913 the following stretches of second track were completed:—Whitewood to Grenfell, 8 miles; Indian Head to Regina, 21.6 miles; Regina to Pasqua, 12 miles, and Caron to Java, 66.7 miles.

The branch line construction carried on during 1913 included tracklaying as follows:—Extension of the branch line northwesterly from Estevan for 47 miles; this line connects with the Weyburn-Stirling line at Forward. Extension of the Weyburn-Stirling line for 162 miles, which carries the line to or just over the boundary line between Saskatchewan and Alberta. Completion of the branch from Kerrobert northeasterly, 22 miles; this line gives a connection between the Moose Jaw-Macklin line and the Portage la Prairie-Wetaskiwin line. Track has also been laid for 60.8 miles additional on what is known as the Swift Current-Bassano line. This carries the line approximately to the Saskatchewan-Alberta boundary.

Alberta Division.—The Board of Railway Commissioners has approved of location plans of the Swift Current Northwesterly branch, mileage 111.17 to 134.38, and for the line running easterly from Bassano to meet the Swift Current Northwesterly branch, mileage 118.39 to 180.20.

Track was laid on the following branches or extensions of branch lines during 1913:—Suffield, southwesterly, 32.3 miles; this line will give a connection with the Weyburn-Stirling line, a new and direct line from Gleichen to Shepard, 25 miles. Extension of the branch line from Lacombe, easterly for 8 miles. This branch connects with the Moose Jaw-Macklin line at Kerrobert.

The Alberta Central Ry., which is being built under C.P.R. auspices from Red Deer towards the Brazeau River coalfields, was expected to have laid 40 miles of track by Dec. 31, but definite reports as to work done had not been received when we were advised.

The addition to the C.P.R. hotel at Banff, Alta., is expected to be ready for occupancy early in the year. The new section is of reinforced concrete, and will increase the number of rooms to 400.

Kootenay Central Ry.—We are officially advised that track was laid during 1913 on a further 19.7 miles of this line. Track was laid for 14.50 northerly from Colville, and for 41 miles south from Golden, B.C., during 1912. The remaining mileage is under construction, and it is expected to have it completed by the end of 1914.

Pacific Division.—During 1913, track was laid on 16 miles of the Whitewater-Kaslo line. This covers an extension of the Three Forks-Whitewater line, on which track was laid during 1912, the connection of the same with the old Kaslo and Slocan Ry., and the reconstruction and conversion of that line to standard gauge.

The second track between Hammond and Ruby Creek, 59 miles, was laid and is being operated over.

We are officially advised that the press dispatch from Denver, Col., Dec. 5, to the effect that the C.P.R. had let a contract for the driving of a 10 mile tunnel at Rogers Pass, B.C., to cost $8,000,000, to James A. McIlwee & Son, of that city, is incorrect. The contract, as stated on pg. 485 of our issue for Oct., 1913, was let to Foley, Welch and Stewart, and we are advised that "the work is not sublet, neither would the cost named be anything near the estimate." The tunnel is to be five miles, and not ten miles long.

There is a proposal to give J. A. McIlwee & Son a contract for the pioneer tunnel to be used in connection with the construction of the tunnel proper, but this has not been decided at the time of our advice, Dec. 17.

Considerable work has been done on the new double track bridge over the Harrison River at Pitt Meadows, which is being built in connection with the development of the new yards at Coquitlam.

Press reports state that arrangements are being made for the building of large oil tanks at Port Moody, for use in connection with the pipe line, thence to connect with the tanks at Coquitlam, which is now being laid. (Dec., 1913, pg. 576.)

Renewing Switches with Wrecking Cranes is a method of handling track alterations that has been employed in several cases on the Philadelphia & Reading Ry. In some recent changes near Vine St., Philadelphia, it became necessary to put in some additional slip switch crossings and to shift others, and these were handled bodily. The new double slip crossings were put together on skids at the side of the track. Two wrecking cranes, with four part sling chains attached to the hoisting block, were then attached to the rails and ties of an old crossing, which was ripped out bodily. Then the slings were passed through two of the long end ties of a new crossing, and the crossing swung up and deposited in place, the ballast having been leveled and tamped in the meantime. The work is done very quickly and avoids the long period during which the track would be broken if the old crossover or crossing was taken apart and relaid in the ordinary manner.

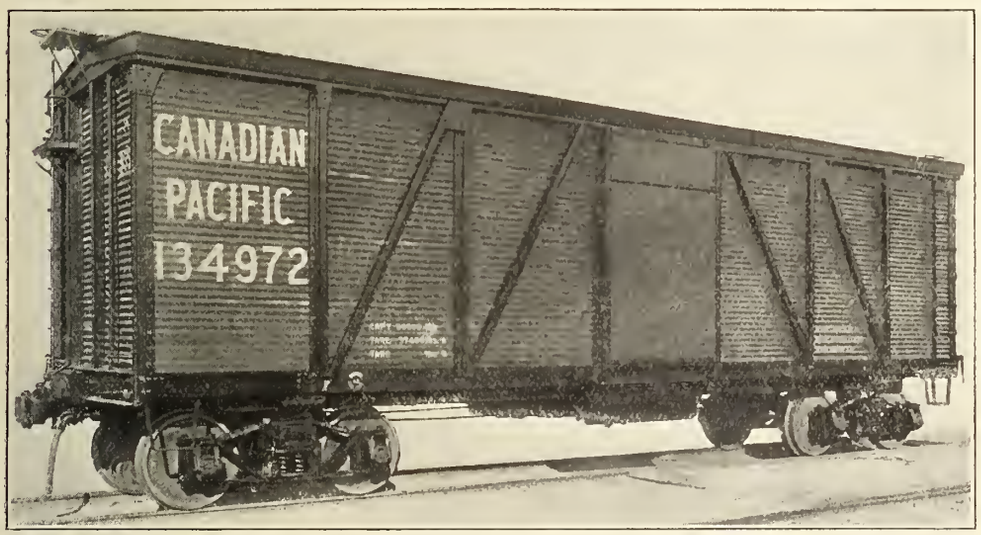
Freight Car Troubles.—J. Coleman, Superintendent Car Department G.T.R., writes:—"It has been the practice on our road to scrap 30,000 and 40,000 capacity box cars when they require a general rebuild. We are not doing anything towards the introduction of strengthening light capacity cars for the reason that they are very unpopular with shippers, and our traffic department is placed at a disadvantage offering light capacity cars for loading on account of the reduced loading space as compared with the modern box car. We believe that this is a question on which the traffic departments should be consulted, and I am sure careful canvass of the officials of the traffic departments would show the consensus of opinion is that light capacity box cars should not be continued in interchance service."—Railway Master Mechanic.

United States Railways.—According to the Interstate Commerce Commission's statistics for the year ended June 30, 1912, there were 240,238 miles of track operated in the U. S. The average number of locomotives per 1,000 miles of line was 265, and the average number of cars was 9,860. The total number of persons on the payrolls was 1,699,218, and the total wages and salaries paid amounted to $1,243,113,172. The par value of the amount of railway capital outstanding was over nineteen and a half billion dollars.

Steel Upper Frame and Steel Underframe Box Cars.

In the unavoidable absence of R. W. Burnett, General Master Car Builder, C.P.R., his paper on steel underframe box cars, which appears on pages 1 to 4 of this issue, was read before the American Society of Mechanical Engineers, New York, on Dec. 3, by H. H. Vaughan, Assistant to the Vice President, C.P.R. A paper on steel underframe box cars, by G. W. Rink, Mechanical Engineer, Central Rd. of New Jersey, an abstract of which is given on page 4, was read at the same meeting, the two papers being discussed together. Following is a portion of the discussion:—

H. H. VAUGHAN, Assistant to Vice President, C.P.R.—I feel that Mr. Burnett's paper has, unintentionally, to a large extent referred to what Mr. Rink has said about the standard car. Personally, I feel that Mr. Burnett's position, that with the structural steel car we have to all intents and purposes a car that is standard as far as any car can be standard, is a sound one. I do not believe that we are ever going to adopt one standard type of car or one standard design of car and build it indefinitely. There are sure to be improvements and alterations that the different roads think it desirable to make, and if we had a standard car tomorrow the next order that was let would have a few changes from it. If we use standard material that can be obtained without difficulty, and keep to certain standards on the parts that both Mr. Rink and Mr. Burnett have mentioned, I think that we are going as far as we can go in the direction of a standard car. I quite agree that the draft castings, arch bars, bolsters and some of the other parts should be standardized to a greater extent than at present. It does seem absurd that the slight variations made in these parts should necessitate their being obtained from the car owners, when repairs are to be made on foreign lines, and that serious delays should ensue on account of these parts not being available.



Standard Canadian Pacific Railway Steel Frame Car Fitted with Corrugated Steel Lining.
For description see page 4 of this issue.

We have been a good deal criticized on account of certain features in the design of the C.P.R. car, such features as I think Mr. Rink refers to when he says there was not very good engineering carried out in the design of the steel underframe. Some of the features of our underframe design were not altogether a question of engineering, but largely governed by a feeling I had that if you make a thing plenty strong enough you never lighten it, but that if you make a new design a little fine and then strengthen it at the weak points, you will finish up with a considerably lighter design than if you started out with some arbitrary figures and made everything plenty strong enough to start with.

In designing a car, what must be considered is the service in which it is generally going to run, not the service in which it may run. We estimated that 60 to 75% of the service to which the box cars are put, both in Canada and in the United States, is service in which the old type of underframe will stand up perfectly satisfactorily. I feel that that assumption is justified by the results we have had. If there was any decided weakness in this type of car we would certainly have found it out in five years. The fact that we have had 14 or 15 cars destroyed on foreign lines indicates that, while the construction may not be as strong as would be desirable for some service, it is strong enough for the average service in which the cars are used. I do not believe to-day that it is a good commercial proposition to put weight in a car for occasional service.

The omission of the end braces and the corner braces has been discussed. The centre sills and the side sills have ample strength to hold up the corners of the cars under general conditions, and the saving of 500 lbs. weight there, and 500 lbs. in the cover plate, and a few hundred pounds here and there, is what has made the car as light as it is.

Attention should be drawn to the effect of reduced weight on net earnings, and not on the cost per ton mile. The C.P.R. figures for 1913 show that we carried 22.34 tons per loaded car mile, and our light car mileage was 28.5% of the loaded car mileage. That gives an average load of 16.8 tons per car mile total. I have not the average car weight, but I do not think we are far off in taking it to be 18 tons; the average weight of the car loaded was then 34.8 tons. I do not believe that figure is out of the way for a large number of roads in this country handling general traffic. We have a large amount of grain, and while we do not have much coal our average load is fairly good.

Supposing the car weighed one ton more. Without any question as to whether we would always change our train rating, the weight of the car loaded would be 35.8 tons instead of 34.8; in other words, there would be an increase in the ton mileage of 2.85%. Or suppose we were operating on a ratio of 70%, under this changed condition of weight we would be operating on a ratio of 72%. Our net tons would fall from 30% to 28%, which is a difference of 6%; in other words, while we have only changed 2% in our cost of transportation, we have changed about 6% in our net earnings, and net earnings are what we are after. It does not take very much of a change in transportation matters to make quite a change in net earnings. It takes less than it does to make a change in gross earnings. Even supposing that one half the time the weight of the car makes no difference, it depends on how tonnage is handled; on the C.P.R., on which a large percentage of the traffic is on grades over 0.6%, tonnage is what we are after. If we are within a certain number of tons of the right load we take it, and if it is less than that we put on another car. Taking only half, the handling of a ton makes a difference of 1% in the expenses and 1 1-5% in the net earnings. Taking the size of the car, and only taking one half of the actual difference in weight, we find that it amounts to about $12 a ton per year. That is only assuming that one half the difference in weight makes any difference. We can do a good deal on a lot of cars with $12 a ton per year.

The question of weight is something which must be looked after carefully in car design; we must not give all our attention to designing a car that is cheap to keep up and which will not need repairs, but try to design a car that is most economical for the railway company in handling its traffic. It may cost $5 or $10 a car more per year to keep up, but it will save two or three times that in the weight that is being hauled about uselessly.

In reference to vertical or horizontal sheathing, Mr. Burnett stated that there were a number of cars which were quite open. We have had a lot of cars which have shrunk to an extent to cause us a great deal of anxiety, but we have had singularly few cases of damage claims on account of it. The planks are all shiplapped, and when looking at a car it would almost seem possible to see through the openings. But it is not difficult to tighten them, and the only reason we have not done so is because we have not had sufficient complaints to justify our taking the cars out of service and doing the work. The vertical sheathing would be, possibly, a preferable arrangement if it could be accompanied by an economical and convenient design of side framing. The truss form of side framing naturally lends itself to horizontal sheathing. We are using very extensively the same style of end for repairs of all-wood cars that we use on the steel frame car, simply putting in two Z bars, reinforcing the ordinary end post, and putting the ¾ in. lining outside.

B. D. LOCKWOOD, Chief Engineer of the Pressed Steel Car Company, stated that he believed the railways should specify the minimum stresses allowable in box car frames in order that builders may have something definite to work to.

W. F. KIESEL, Jr., Assistant Mechanical Engineer, Pennsylvania Rd.—The authors of both papers seem to favor the Z bar posts and braces because they are made of rolled material, and, as stated by them, can be readily obtained. This does not seem a good argument, as it is well known that standard sections of rolled material cannot always be obtained on short notice; in fact, within the past year the steel mills have quite frequently reported that certain angles, etc., could not be furnished under

three or six months, as there was no stock on hand and they did not expect to put in the rolls for that length of time. Advocates of pressed steel for this purpose assert that pressed steel posts and braces are lighter per unit of strength, because they can be formed to the required shape; that they can be formed with sufficient surface at the ends for the number of rivets required to develop their full strength, while Z bars and other rolled forms require gusset plates for this purpose; that they are not likely to be damaged by pushpoles, and if damaged in wrecks, can be readily straightened and restored to approximate shape; and that when absolutely necessary to replace them they can readily be obtained from the car owner or builder, without waiting for any special rolling of material.

O. C. CROMWELL, Mechanical Engineer, Baltimore and Ohio Rd.—Side and end posts and braces, corner posts and door posts, should be brought down to a standard; they are now very nearly this. The height of the floor above the rail is an important point, and there should be no good reason why we should have a variation 6¾ in. in this height. This also affects the height of the truck, as if it is desired to work toward standard and interchangeable truck parts, the height of the truck is an important one to hear in mind.

I observe that no diagonal braces are used in the end framing of the C.P.R. steel frame car, such as are generally used in the end of a wooden frame car. These braces tend to keep the end framing of the car square. While their omission would probably not be apparent for the early life of the car, should we not expect to find, as the car ages, a loosening of the riveted joints uniting the posts with the plates and underframe? While the car is new, the end sheathing will serve to keep the framing straight, but will we not in time experience loosening of these end boards through shrinkage? We know that on gondola cars the side planks decay under the side stakes and under the corner bands. May we not, as the cars become older, experience a similar action of the lumber in this character of car? Would not this in turn lead to the loosening of the framing?

The Baltimore & Ohio built, in 1862, some iron box cars. These cars had wooden underframes, but the body and roof were made of iron plates. The cars proved unsatisfactory because in the summer they became so excessively heated that they spoiled the merchandise, and in sudden changes of weather produced sweating, with damage to the lading. They had finally to be withdrawn from service.

W. S. ATWOOD, Chief Engineer, Canadian Car & Foundry Co.—The first steel frame car which we built was considerably heavier that the present ones, weighing 41,000 lbs. This was partly due to the fact that the car was constructed from material which was in stock, no special material having been ordered. The present car weighs less than 36,000 lbs.

With the first cars of this type there was some difficulty experienced in securing the proper grade of lumber and also in properly drying it, as, owing to its thickness, it had to remain in the dry kilns longer than was necessary in the case of the thinner sheathing used on the outside sheathed car. On this account the car companies were not, in all cases, equipped with sufficient dry kiln capacity. The lumber dealers, however, have met the car builders in attempting to prepare a satisfactory grade of lumber, and no difficulty is now encountered.

The adoption of a car with standard inside dimensions would be a matter of considerable importance to the car builders, as material could be stocked and would be available for building cars required for quick delivery for any of the railways which had adopted this type of car.

The foregoing report of the discussion is abstracted from the Railway Age Gazette.

Great Northern Railway Lines in Canada.

Projected Lines in Saskatchewan and Alberta.—The extension of the line from Niobe, N.D., to Northgate, on the International Boundary, 21 miles, has been completed, and a connection established with the Grand Trunk Pacific Ry. branch from Regina, Sask.

An extension of the branch now terminating at Plentywood, Mont., westerly for 45 miles to Scobey, is reported to have been completed. This extension runs parallel with the International Boundary.

Another line is under construction under the charter of the Grand Falls and Felon County Ry., from Power to Bynum, Mont., on which 45 miles of track has been laid. This line runs northerly and its present terminus is almost directly south of Cardston, Alta.

L. Hill, President, accompanied by several G.N.R. officials, recently completed a trip through Southern Saskatchewan and Alberta, stopping at Swift Current, Medicine Hat, Calgary, Lethbridge and Cardston. G.N.R. interests hold several charters covering the building of lines in these two provinces, and also own the Crows Nest Southern Ry. A large amount has recently been expended on developing coal mines in the Pincher Creek district, and recent local press reports state that it is expected that a start will be made with railway construction in that district in the spring.

Kootenay Ry. and Navigation Co.—The G.N.R. President reported at the annual meeting of shareholders that because of the liquidation of the K.R. and N. Co. the Bedlington and Nelson line between Sirdar Jct. and Kuskanook, B.C., 3.26 miles became of no use and had been removed.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—The G.N.R. President reported at the recent annual meeting that work was in progress on the line of the V., V. and E. Ry. and N. Co., from Kilgard to Sumas Landing, B.C., 10 miles, and on an extension from Coalmount to Otter Summitt 35 miles. The Board of Railway Commissioners has authorized the opening for traffic of a section of the line from mileage 245.84 to 155.619, which is a double track section.

In connection with this line the G.N. Ry. is engaged in building a line in the U. S. to connect at Oroville. The section under construction during the current year extends from Wenatchee to Pateros, Wash. Owing to landslides and other difficulties construction has been delayed, and it is not expected that the line will be ready for operation until June, 1914. The line is 133 miles, and track laying will probably be completed by Mar. 31, 1914.

Vancouver Terminals.—The excavations on the Grandview cut in Vancouver, B.C., are practically completed. The original width of the cutting was 38 ft., but in view of the False Creek reclamation and terminal project, it has been made 66 ft. The greatest depth is 65 ft. The cutting is spanned by seven bridges, and others will be added as street traffic necessitates. Four lines of track have been laid in the cut, and this line of approach into the city, which is 1.5 miles long, has a gradient of 1%. The line originally crossed the streets on the level.

The erection of the warehouses on the new dock on Burrard Inlet is being proceeded with. It is expected that the wharf and its equipment will be finally completed by the end of the year.

It is reported that 70% of the work on the reclamation of the False Creek flats has been done. The area near Main St., which will be used as the site of the union station, has been entirely filled in, and the work is now in progress to the original shore line. L. Hill, President, and a number of G.N.R. officers were in Vancouver recently inspecting the progress of the work. The site upon which the station is to be built was selected, and it is said that tenders for the building will be called for at once. (Oct., pg. 479.)

Additional Lines in New Brunswick Controlled by Canadian Pacific Railway.

The C.P.R. commenced, Dec. 1, to operate the lines of the New Brunswick Coal and Ry. Co., the Fredericton and Grand Lake Coal and Ry. Co., and the Southampton Ry. in New Brunswick, which have been leased. They are being operated under the supervision of the General Superintendent of the Atlantic Division.

A. Sherwood, heretofore Manager, New Brunswick Coal and Ry. Co., which has hitherto been operated by a commission for the New Brunswick Government, has also been appointed Manager, F. & G.L.C. & R. Co., and Southampton Ry., and his office has been moved from Norton to Fredericton, N.B.

H. Larsen has been appointed Roadmaster of the combined lines, vice —. Baker, assigned to other duties.

Hamilton Incline Ry.—The Ontario Railway and Municipal Board issued an order, Nov. 25, directing the owners of this line to put it into a safe condition for operation. An engineer representing the Board subsequently visited Hamilton for the purpose of ascertaining the work necessary and the time required to do it.

Ottawa Car Manufacturing Co.—W. M. Arnold, heretofore Purchasing Agent, has been appointed Assistant General Manager. H. T. Burpee has been appointed Controller.

The C.P.R. is reported to have discharged its Japanese porters on sleeping and cars running west of Winnipeg, and to have replaced them with negroes. The change took effect Dec, 12.

L. R. Johnson, General Superintendent, Angus Shops District, C.P.R., read a paper before the Canadian Railway Club in Montreal, Dec. 9, on first aid to the injured as practised by the St. John Ambulance Association, under the auspices of the Order of St. John of Jerusalem, in England.

J. Grey, a C.P.R. locomotive driver living at West Toronto, was fined $100 at Ingersoll, Ont., Dec. 11, for being intoxicated while in charge of a locomotive. The sentence was directed to be held in suspense and Grey was directed to report to the C.P.R. solicitors in Toronto when required.

The conciliation board in connection with the enquiry into the dispute between the G. T. Pacific Ry. and its machinists and boiler makers, consists of Mr. Justice Haggart, Chairman; W. Cross, representing the company, and C. J. Murray on behalf of the men, all of Winnipeg.

A Lehigh Valley Rd. Pacific type locomotive, weighing in working order 262,000 lbs., with 77 in. drivers, recently made a record in hauling an 8 car all steel train, weighing 603 tons, over a 24 mile stretch at an average speed of 38.1 m. p. h. against an average grade of 42.1 ft. per mile, with a maximum gradient of 67.9 ft. per mile.

Canadian Northern Railway Construction, Betterments, Etc.

James Bay and Eastern Ry.—The first section of this railway is under construction from Roberval, Que., the northerly terminus of the Quebec and Lake St. John Ry., 30 miles northerly. We are officially advised that grading upon this is well advanced. J. P. Mullarkey, Montreal, is the contractor, and A. F. Stewart, Chief Engineer of Construction, Mackenzie, Mann & Co., Ltd., is in charge of the work.

Canadian Northern Quebec Ry.—The extensions and branch lines located, but not yet finally passed for construction are:—Huberdeau Argenteuil county, Que., to St. Remi, 11 miles, and from Rawdon to St. Donat, 40 miles. These lines are projected for the purpose of opening up new territory lying between the old Great Northern Ry. and the old Montford Colonization Ry., both of which are now part of the C.N.Q.R. Another charter also amalgamated with the C.N.Q.R. is the Quebec, New Brunswick and Nova Scotia Ry., under which it is proposed to build a line from Quebec Bridge to Woodstock, N.B.

Canadian Northern Montreal Tunnel and Terminal Co.—The headings of the tunnel being driven under Mount Royal, to give the C.N.R. an entrance into Montreal, were joined on Dec. 10. The heading is 8 by 12 ft., and the work of enlargement to 22 by 30 ft. is being gone on with.

Plans have been filed in Montreal showing a revision of the location of the line to connect the tunnel with the St. Lawrence water front. These have been approved by the Board of Railway Commissioners.

The Central Ontario Ry. is asking the Dominion Parliament for an extension of time within which to complete the line from its present northerly terminus to a junction with the C.P.R. at some point between Sudbury Jct. and Callander station, Ont.

Canadian Northern Ontario Ry.—A mixed freight and passenger service has been put in operation on the Ottawa-Sydenham section of the Ottawa-Toronto line which has recently been completed. A regular freight and passenger service has been operated for some time between Toronto and Sydenham, and these services will be run through to Ottawa early in the spring.

The Board of Railway Commissioners has authorized the opening for traffic of the branch from Oshawa station to the material yard south of William St., 2.75 miles, and the building of a transfer track between the C.N.O.R. Oshawa spur and the Oshawa Ry.

Montreal-Ottawa-Port Arthur Line.—Track was laid during 1913, on 536 miles of this line, distributed as follows:—Between Montreal and Hawkesbury, Ont., 10 miles; between Ottawa and Capreol, Ont., 120 miles; between Ruel and Port Arthur, 406 miles. The line is being built, under special guarantees by the Dominion Government, under the charter of the Canadian Northern Ontario Ry. Ballasting and other work are reported well forward from Ruel west. Ballasting is also reported to be completed up to 200 miles easterly from Port Arthur, and one lift has been given to mileage 244, where the bridge work is not completed. Another bridge at mileage 253 is also incomplete. All the stations, section houses and other buildings up to mileage 200 have been erected.

Canadian Northern Ry.—The Saskatchewan Legislature has increased the amount of securities previously guaranteed by $2,000 a mile, making the guarantee $15,000 a mile. The lines in respect to which the guarantee apply are set out in sec. 9 of the act passed in 1908, as it is amended by chap. 4 of the statutes of 1909; and in chap. 8 of the statutes of 1912. Sec. 6 of the recent act authorizes the Government to guarantee the bonds for any surplus mileage on the lines mentioned in the several acts over the mileage specifically guaranteed at $13,000 a mile, or in the event of there being a shortage of mileage the Government may authorize the application of the surplus of guaranteed bonds to be used in respect to the construction of other lines to be built.

A second act provides for the payment of interest on these securities at 4½%, and for the building of the following lines:—In further extension of the line mentioned in par. 1, second part of the schedule to chap. 3, statutes of 1908-09, westerly from mileage 210 for 60 miles; in further extension of the line mentioned in par. 3 of the same schedule from mileage 50 from North Battleford northwesterly for 39 miles; from mileage 100, on the Thunder Hill branch west of the eastern boundary of the Province, westerly for 40 miles; and any extension of any lines authorized to be built in Saskatchewan, as may be designated by the Government, not to exceed 40 miles in any one instance.

A third act deals with the guarantee of the bonds of the C.N. Saskatchewan Ry. The amount of the bonds to be guaranteed is increased to $15,000 a mile, the rate of interest is fixed at 4½%, and an extension of time for construction granted. It is also provided that the route of the line set out in par. 5 of the schedule to chap. 11, statutes of 1912, may be changed so as to be routed from Handsworth on the company's authorized line from Lampman northerly, westerly or northwesterly.

In a statement made to the House in connection with these measures it was mentioned that the Government had guaranteed bonds for the building of 1,155 miles of line. The sale of the bonds had realized so far $9,703,668.98, of which $8,577,067.76 had been released to the company for work done.

The Saskatchewan Legislature has been informed that surveys for the proposed branches from Lampman northerly through the territory lying north westerly from Moose Mountain have been completed, but have not yet been approved by the Provincial Minister of Railways. The company has agreed that construction on these lines, the bonds for building which have been guaranteed by the Legislature, will be started early in 1914. The construction programme for 1914 had not been finally agreed upon between the Government and the company. The extension of the branch southerly from DeLisle, would probably be gone on with, but the final location plans had not been approved.

The line from North Battleford which has hitherto been in operation to Edam, Sask., 38 miles, has been extended to Mervin, Sask., 11 miles, tracking being reported to have been laid into that place Dec. 8.

The first through train on the branch line from Radville into Moose Jaw, Sask., ran into the temporary station on South Hill, Dec. 5. For some time previously the trains had only been operated to a point three miles out of the city. The line goes into the city on a trestle bridge over the river and the C.P.R., which is to be replaced early in the year by a steel structure. It was reported in Moose Jaw, Dec. 13, that an arrangement had been made under which the C.N.R. will join with the G.T. Pacific Ry. in building a union station at Moose Jaw, and will have running rights over the latter company's line to Regina. The Saskatchewan Legislature was asked, Dec. 12, to consider a measure guaranteeing bonds for $1,000,000 for aiding the construction of terminals and bridges in Moose Jaw. The bill provides that the works shall be immediately put in hand, and that when completed they shall be used jointly with the G.T. Pacific Ry. or any of its allied companies.

Moose Jaw press reports also state that a line is projected from that city southwesterly between Lakes Johnston and Chaplin to a junction with the line to Lethbridge, near Maple Creek, and for a line from Moose Jaw to Chamberlin on the line from Regina to Prince Albert.

The line from Camrose, Alta., southeasterly, on which grading is reported to have been completed for 60 miles, has been located through to Sibbald, at the Saskatchewan-Alberta boundary, on the Saskatoon-Drumheller line, 165 miles. This piece of grading is stated to be a 58 mile tangent. A new town, Alliance, is being laid out at mileage 59.5.

Canadian Northern Pacific Ry.—The Dominion Government Inspector went over the line out of Port Mann as far east as Hope, B.C., Nov. 20, for his final inspection. It is expected that this section of the line will be taken over by the operating department. The end of track easterly was reported to be at mileage 129, and ballasting has been completed to mileage 120. The grading is practically completed from this point to Kamloops. East of Kamloops 90 miles of track is reported to have been laid, and grading is well forward to the Albreda Summit. Eight of the bridges have been completed; three others are reported to be well forward as far as the steel work is concerned; and the substructures for the others are being progressed with. It is also reported that the section which is being built from the west to the Albreda Summit, is 90% completed so far as the grading is concerned.

The locomotive house at the Port Mann terminal is under construction, and the foundations are being piled for the machine shop and other buildings.

The question of the route of the tunnel, which will give an entrance from the north arm of the Fraser River to the terminal on False Creek, Vancouver, is still undecided. two routes being under consideration.

An area of about 80 acres has already been reclaimed from the False Creek flats, for the company's terminal. About 600,000 cubic yards of material were reported to have been deposited Dec. 4, and this is stated to represent about a sixth of the work to be done.

Vancouver Island Lines.—It was reported Dec. 9, in Victoria, that about 85% of the work on the Victoria-Alberni line had been completed, and that considerable progress had been made with the line from Victoria along the Saanich Peninsula. It is expected that steel will be delivered in order to start track laying in February. (Dec., 1913, pg. 584.)

Oil Burning Locomotives on C. P. R.—We were officially advised, Dec. 5, that 45 locomotives had been equipped for oil burning to operate between North Bend and Vancouver, the applying of the apparatus having been done at Vancouver. Seventy-nine locomotives have been similarly equipped to operate between Field and Kamloops, most of the work having been done at Vancouver, and the rest of it at Ogden shops near Calgary. No arrangements have been made for similarly equipping locomotives to operate on other portions of the Pacific Division.

The Grand Trunk Pacific Ry. opened the Fort Garry Hotel at Winnipeg, Dec. 10.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Eastern Ry.—J. P. MADER has been appointed General Agent at Sudbury, Ont. All reports, communications, etc., from agents, heretofore required by General Freight and Passenger Agent, are forwarded to him.

Canadian Northern Ry.—H. R. ARTHUR, heretofore chief clerk, General Manager's office, Winnipeg, has been appointed Inspector of Transportation. Office, Winnipeg.

O. D. PROSSER, heretofore assistant chief clerk, has been appointed chief clerk, General Manager's office, Winnipeg, vice H. R. Arthur, promoted.

WILLIAM KILBY, heretofore secretary to Assistant General Manager, has been appointed Fire Inspector. Headquarters, Winnipeg.

Canadian Pacific Ry.—F. B. TAPLEY, whose appointment as Assistant Engineer, Maintenance of Way, Eastern Lines, Montreal, was announced in our last issue, has been appointed Assistant Engineer in Assistant Chief Engineer's office, vice M. A. Fullington, transferred, and not Assistant Engineer, Maintenance of Way. We are officially advised that there is no Assistant Engineer, Maintenance of Way, Eastern Lines.

J. E. MORAZAIN, heretofore Assistant Superintendent, District 3, Eastern Division, Quebec, Que., has been appointed Assistant Superintendent, Montreal Terminals, vice A. C. Brady, deceased. Office, Windsor St. Station.

T. M. BARRETT, heretofore Purchasing Agent, Sleeping Dining and Parlor Cars and News Department, Calgary, Alta., is reported to have been appointed Chief Commissary Agent, same department, Montreal, vice A. S. Maynard, who, it is stated, has resigned to enter private business.

W. BALLANTYNE, heretofore in the Passenger Department, has been appointed chief clerk, Atlantic Steamship Department, Montreal, vice W. C. Casey, appointed General Agent, Passenger Department, Steamship Lines, Winnipeg.

JOHN GRIFFIN, District Freight Agent, C.P.R., Toronto, has resigned, to enter private business in Milwaukee, Wis.

W. C. CASEY, heretofore chief clerk, Atlantic Steamship Lines Department, Montreal, has been appointed General Agent Passenger Department, C.P.R. Steamship Lines, Winnipeg, vice J. S. Carter.

F. STAMELIN, heretofore Shop Foreman, Winnipeg, has been appointed Night Locomotive Foreman, Winnipeg roundhouse, vice J. Morton, transferred.

R. BROWN has been appointed District Master Mechanic, Medicine Hat, Alta., vice W. W. Webster.

Central Railway of Canada.—F. Stuart Williamson, M. Can. Soc. C.E., Chief Engineer, having resigned, has been appointed Consulting Engineer. Office, Montreal.

Grand Trunk Pacific Ry.—J. H. TODD, heretofore Assistant to Superintendent, Smithers, B.C., has been appointed Superintendent there, vice G. A. McNicholl, transferred to Traffic Department.

The following agents have been appointed:—Holden, Alta., K. Fraser; Edmonton, Alta., O. J. Rowe; Beiseker, Alta., C. W. Storey; Tete Jaune, B.C., F. R. Harrison; McBride, B.C., J. S. Dobie; Rose Lake, B.C., R. A. Pake; Smithers, B.C., W. W. Noonan; Pacific, B.C., T. S Constantine.

Grand Trunk Ry.—D. ROSS, heretofore Locomotive Foreman, Madawaska, Que., has been appointed Locomotive Foreman, Coteau Jct., Que., vice W. A. Black, transferred.

J. H. RHYMB has been appointed Locomotive Foreman, Madawaska, Que., vice D. Ross, transferred.

W. J. HARDING, heretofore Locomotive Foreman, Depot Harbor, Ont., has been appointed an engineer of the power plant at Ottawa, Ont.

J. B. DUNLOP has been appointed relieving Locomotive Foreman, Mimico Yards, Toronto, during absence of J. H. Storaz, who was seriously injured recently.

W. GRUNDY, heretofore in Union Stock Yards Co.'s service, and at one time chief clerk, Ticket Office, G.T.R., Toronto, has been appointed Station Ticket Agent, Toronto, vice A. Albertson, assigned to other duties.

W. A. BLACK, heretofore Locomotive Foreman, Coteau Jct., Que., has been appointed Locomotive Foreman, Depot Harbor, Ont., vice W. J. Harding, assigned to other duties.

D. W. THORNTON, heretofore Yardmaster, Michigan Central Rd., St. Thomas, Ont., has been appointed General Yardmaster, G.T.R., London, Ont., vice W. J. Ball resigned.

The following agents have been appointed:—Blair, Ont., C. Noecker; Ingersoll, Ont., F. N. Burke; Hickson, Ont., R. J. Campbell; Chesley, Ont., G. Reid; Cedars, Que., J. S. Bolduc.

Michigan Central Rd.—F. J. DEIMLING, heretofore Engineer of Construction, has been appointed Assistant Chief Engineer, vice A. L. Sarvey, assigned to other duties. Office, Detroit, Mich.

C. C. Hill, heretofore Division Engineer, Niles, Mich., has been appointed Engineer of Construction, vice F. J. Deimling, promoted. Office, Detroit, Mich.

F. B. MARBLE, heretofore Assistant to Chief Engineer, Detroit, Mich., has been appointed Division Engineer, Niles, Mich., vice C. C. Hill, promoted.

A. B. McBURNEY has been appointed Yardmaster, St. Thomas, Ont., vice D. W. Thornton, resigned to enter G.T.R. service.

New York Central Lines.—E. A. McCARTHY has been appointed Travelling Passenger Agent, Montreal, vice A. E. Lock, whose appointment as Commercial Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was announced in our last issue.

Northern Pacific Ry.—A. M. BURT, heretofore Division Superintendent, Spokane, Wash., has been appointed Chief Engineer Maintenance of Way, vice W. C. Smith. Office, St. Paul, Minn.

South Eastern Ry.—F. S. Little has been appointed Secretary-Treasurer London and South Eastern Ry., London, Ont., in succession to his father, J. W. Little, deceased.

Use of Natural Gas on Intercolonial Railway.—Since the article on this subject which appears on page 14 was put in type, we have been officially advised, in answer to an inquiry, that no trouble has been experienced on account of mixing the natural gas and the Pintsch gas which is put into the car reservoirs at Montreal, while natural gas is put in at the eastern points. The I.R.C. has tanks placed on ordinary flat cars for transporting the gas from Moncton to Halifax and Levis, each tank holding 1,700 cu. ft. at one atmosphere. It is charged or loaded at about 14 to 15 atmospheres. There are separate tanks and compressors for unloading the tank cars and charging the passenger cars at the charging stations at Halifax and Levis.

Terminal Plans for Quebec.

An Ottawa press dispatch, Dec. 22, stated that the Minister of Railways had that day signed "the agreements which will enable the start of work on the immense terminal undertakings" in Quebec, which involve the building of "a union station, and also a freight depot, extensive car shops at St. Malo, and a large freight yard at St. Foye. A tunnel is to be built between the union station and the harbor front station."

The contract for the building of the shops at St. Malo, at a cost of about $1,500,000, was let in September to J. Gosselin, Levis, Que., by the National Transcontinental Railway Commission. A description of the works covered by this contract appeared in Canadian Railway and Marine World, Sept., 1913, pg. 409. During Oct., the negotiations between the C.P.R. and the city of Quebec as to certain arrangements which would enable progress to be made with the laying out of union terminals in the city were completed, and we were officially advised of the signing of the same on behalf of the C.P.R. In November it was announced that a tunnel would be built in connection with the terminal plans at Quebec, from Lampson's Cove to St. Malo, near the site of the shops. (See Dec., 1913, pages 577 and 578.)

Kettle Valley Ry. and C.P.R.—The Board of Railway Commissioners has recommended the Governor-in-Council to sanction an agreement made June 2, between the K.V. Ry. and the C.P.R. providing for an interchange of traffic. On completion of construction the line will be taken over by the C.P.R.

Quebec Central Ry.—The Quebec Legislature is being asked to authorize the directors to fix by bylaw the time and place at which the annual meeting shall be held.

Canadian Government Railways

TENDER

SEALED TENDERS, addressed to the undersigned and marked on the outside, "TENDER, Diversion of Line North Sydney to Leitches' Creek," will be received up to and including

TUESDAY, JANUARY 6TH, 1914,

for the construction of a line of Railway from North Sydney to Leitches' Creek, N.S.

Plans and specifications may be seen at the office of the undersigned at Ottawa, Ont., at the Station Master's Office, North Sydney, N.S., and at the Office of the Chief Engineer, Moncton, N.B., where forms of Tender may be obtained.

All the conditions of the specification must be complied with.

L. K. JONES,
Assistant Deputy Minister and Secretary, Department of Railways and Canals, Ottawa, Ont.

Ottawa, Ont., Dec. 16th, 1913.

CALGARY AND EDMONTON RAILWAY CO.

NOTICE.—The Calgary and Edmonton Railway Company will apply to the Parliament of Canada at its next session for an Act increasing its bonding powers, and for other purposes.

Dated at Montreal this 17th day of December, 1913.

H. C. OSWALD,
Secretary.

Pringle, Thompson, Burgess & Cote,
Ottawa agents.

Mainly About Transportation People.

SIR THOS. G. SHAUGHNESSY spent a week end in Ottawa recently as a guest of the Duke and Duchess of Connaught.

G. E. Rutley, who died recently at Winnipeg, aged 61, was father of B. G. F. RUTLEY, ticket agent, Union Station, Winnipeg.

W. E. Apps, son of WILLIAM APPS, who was at one time Master Car Builder, C.P.R., died at his father's house, Toronto, Dec. 3, age 29.

R. H. LEA, General Agent, Great Western Ry., of England, at Toronto, left there, for England, Dec. 13, on account of a death in his family.

F. C. SALTER, European Manager, G.T.R., G.T.P.R., and Canadian Express Co., who has been visiting Canada, has returned to London, Eng.

G. D. PERRY, General Manager, Great Northwestern Telegraph Co., Toronto, has been elected Vice President, Toronto Carpet Manufacturing Co.

S. W. HOPKINS, who died at New York, Dec. 14, was connected with the organization of the Chicago and Grand Trunk Rd., a subsidiary of the G.T.R.

J. QUINLAN, District Passenger Agent, G.T.R., Bonaventure Station, Montreal, returned to duty early in December, after an absence through illness.

The engagement is announced of Miss Edith M. Shaughnessy, youngest daughter of SIR THOS. G. SHAUGHNESSY, to R. M. Redmond, of Montreal.

F. BARLOW CUMBERLAND, ex Vice President, Niagara Navigation Co., who died at Port Hope, Ont., in September, left an estate valued at $114,979.83.

W. D. REID, President, Reid Newfoundland Co., has returned to Montreal, from St. John's, Nfld., having completely recovered from his recent illness.

W. WHEATON, who, in partnership with a brother, carried out certain contracts on the National Transcontinental Ry., died in the Montreal Hospital, Dec. 15.

E. J. CHAMBERLIN, President, G.T.R. and G.T.P.R., and Mrs. Chamberlin, were week end guests of the Duke and Duchess of Connaught in Ottawa recently.

It was rumored in Ottawa during December, that R. W. LEONARD, Commissioner, National Transcontinental Ry., would be knighted, early in the New Year.

Persistent reports from Ottawa state that the Hon. F. COCHRANE'S health will necessitate his retirement from the position of Minister of Railways and Canals shortly.

FAIRFAX HARRISON, President, Chicago, Indianapolis and Louisville Railway, has been elected President of the Southern Railway, to succeed the late W. W. Finley.

J. E. GRIFFITH, who has been appointed Deputy Minister of Public Works for British Columbia, vice W. W. Foster, resigned, was at one time connected with C.P.R. construction in the west.

HON. F. COCHRANE, Minister of Railways and Canals, returned to Ottawa, Dec. 20, after an extended holiday. It is understood that his health has been much benefitted by the rest and change.

W. E. DUPEROW, General Agent, Passenger Department, G.T. Pacific Ry., Vancouver, B.C., attended the recent meetings of the North Pacific Coast Passenger Agents Association, at Portland, Ore.

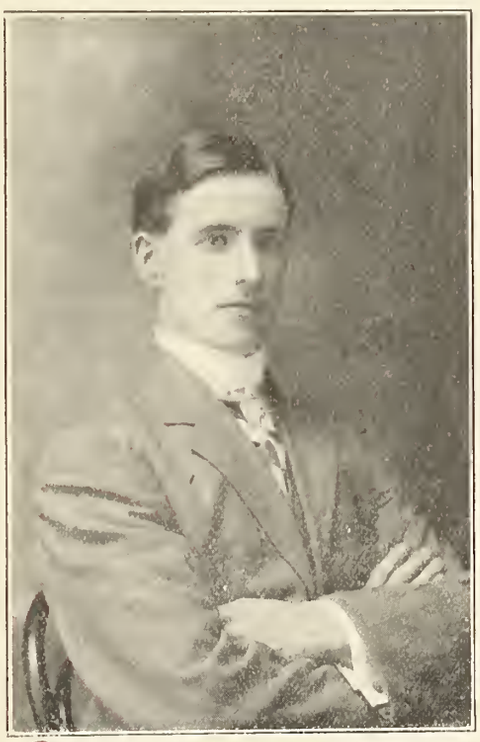
R. W. LEONARD, Commissioner, National Transcontinental Ry., has offered the necessary land and buildings for the establishment of a students' residence and training school for Queens University, Kingston, Ont.

HUNTER BLAIR, who was found dead in his rooms at Toronto recently, was in the Canadian Northern Ry. service there. He is stated to have been a brother-in-law of R. M. Horne-Payne, the C.N.R. director in England.

G. STILSON, Supervisor of Track, G.T.R., Hamilton, Ont., who was injured recently at St. Catharines, when he was thrown off a car of a work train which was being backed into the yard, died in the General Hospital there, Dec. 4.

W. McNAB, Principal Assistant Engineer, G.T.R., gave an address in Montreal, recently, on the progress of the G.T. Pacific Ry., the principles of its success and the advantages of its coast to coast route with low grades, easy curves and excellent roadbed.

D. O. LEWIS, Engineer in charge of the construction of the Canadian Northern Ry.



P 377 H. R. Naylor,
Division Car Foreman, Eastern Division, Canadian Pacific Railway.

on Vancouver Island, was elected vice chairman of the executive committee of the Victoria branch of the Canadian Society of Civil Engineers at the annual meeting, Dec. 11.

JNO. M. EGAN, who was General Superintendent, C.P.R., at Winnipeg from 1882 to 1886, is now President and General Manager, Kansas City Railway and Electric Ry. Co,. of which R. J. Clarke, formerly Assistant Comptroller, Toronto Ry., is Comptroller.

D. A. WALLACE, whose appointment as Resident Engineer, District 1, Eastern Division, C.P.R., Farnham, Que., was announced in our last issue, was formerly on the Central Vermont Ry., there, and prior to that was in Illinois Central Rd. service at Chicago.

G. McLAREN BROWN, European Manager, C.P.R., who has recently been spending some time in Vienna, in connection with the company's Austrian business, and the disturbance it has been subjected to on account of political troubles, returned to London, Eng., Dec. 3.

F. STUART WILLIAMSON, M. Can. Soc. C.E., who has resigned as Chief Engineer, Central Railway of Canada, has been appointed Consulting Engineer for that company, and has opened an office at 103 St. Francois Xavier St., Montreal, for the practice of his profession.

E. E. BRYDONE-JACK, C.E., M. Can. Soc. C.E., Professor of Civil Engineering, University of Manitoba, was presented with a clock at Winnipeg, Dec. 17, by the Manitoba branch of the Canadian Society of Civil Engineers, in recognition of the services which he has rendered to the society.

D. S. SUTHERLAND, General Agent, Michigan Central Rd., Detroit, Mich., died there, Dec. 17. He was appointed General Agent in Aug., 1912, after having held the position of Divisional Superintendent there for about 25 years. He had been in the company's service for nearly 50 years.

SIR WILLIAM MACKENZIE, President, Canadian Northern Ry., who returned to Toronto, Dec. 13, from England, confirmed the report that he had while there disposed of £1,500,000 five per cent. land mortgage debentures, particulars of which were given in Canadian Railway and Marine World for December.

JAMES HOWDEN, the inventor of Howden's patent forced draught for steamships, died suddenly, towards the end of November, in Glasgow, Scotland, aged 81. His first experiments with forced draught were conducted in 1862, but it was not until 1882 that the system was first introduced into steamships.

An unconfirmed report from Winnipeg says that R. J. MACKENZIE, who has spent most of his life in California during the past two or three years, will return to Winnipeg and again take an active part in Canadian Northern Ry. matters, particularly construction, and that he will be appointed Second Vice President.

S. C. HAYWARD, who died at Port Huron, Mich, Nov. 24, aged 84, was in G.T.R. service from early boyhood, holding various positions in the Point St. Charles, Stratford and Port Huron Shops. He retired from active service about 18 years ago, prior to which he had held the position of Master Mechanic for some years.

J. H. STORTZ, Locomotive Foreman, G.T.R., Mimico, Ont., met with a serious accident recently, when he was caught between a locomotive house door and the cylinder of a moving locomotive, when investigating some valve gear trouble on the locomotive. He was badly crushed, two ribs broken and his hip injured, but is reported to be progressing favorably.

W. A. BLACK, who has been appointed Locomotive Foreman, G.T.R., Depot Harbor, Ont., was born at Belleville, Ont., Mar. 27, 1880, and entered G.T.R. service as an improver, in 1900, and later served as a machinist, and to 1911, acted as Night Foreman and Assistant Shop Foreman, Belleville, Ont.; 1911 to 1912, Shop Foreman, Belleville, Ont.; 1912 to Nov., 1913, Locomotive Foreman, Coteau Jct., Que.

JOSEPH ABRAMS, who was recently appointed Wharf Freight Agent, C.P.R., Vancouver, B.C., was born at Manchester, Eng., Jan. 24, 1870, and entered transportation service in 1886, since when he has been, to 1891, yard clerk and checker, Cheshire Lines Committee, Manchester, Eng.; 1891 to 1899, freight handler, car sealer and freight checker, C.P.R., Winnipeg; 1899 to 1907, freight checker, delivery clerk and foreman, C.P.R., Vancouver wharf; 1907 to 1913, General Foreman, local traffic, C.P.R., Vancouver, B.C.

FRANK STAMELIN, who has been appointed Night Locomotive Foreman, C.P.R., Winnipeg, was born at Chatham, Ont., Oct. 16, 1863, and served his apprenticeship there, after which, to May, 1907, he served in various capacities with railway companies in Canada and the U. S. He re-entered C. P.R. service, May, 1907, and was to Sept., 1907, Shop Foreman, Kenora, Ont.; Sept., 1907, to June, 1908, Shop Foreman, Winnipeg; June, 1908, to Feb., 1909, Locomotive Foreman, Saskatoon, Sask.; Mar., 1909, to Dec. 1, 1913, Shop Foreman, Winnipeg.

JOHN WARDLE, who was recently appointed Commercial Manager, Metropolitan Ry., London, Eng., has had considerable railway commercial experience, having been 15 years with the Lancashire and Yorkshire Ry., in England, after which he was Assistant Secretary, G.T.R., London, Eng., and while holding this position accompanied the then President on a tour of the system in Canada and the United States. After holding that office for about four years, he was appointed London Manager of the G.T.R. Traffic Department, which position he held for about a year.

GEORGE HENDRIE, who died at Detroit, Mich., Dec. 20, aged 79, was a brother of the late Wm. Hendrie, the founder of the Hendrie Cartage Co., railway cartage agents. He was engaged in the cartage business in Hamilton, Ont., for a few years, but moved to Detroit nearly 50 years ago, establishing the first freight cartage line there. He was interested in the organization of the Duluth, South Shore and Atlantic Ry., now controlled by the C.P.R., and was President of the Detroit and Buffalo Steamboat Co., and at one time was a director of the Detroit and Cleveland Navigation Co.

LEWIS NORMAN, whose appointment as Storekeeper, C.P.R., Coquitlam, B.C., was announced in a recent issue, was born in Devonshire, Eng., Oct. 5, 1884, and entered C.P.R. service, Feb. 25, 1908, since when he has been, to Dec., 1908, clerk, Vancouver, B.C.; Dec., 1908, to Mar., 1910, storeman, Vancouver, B.C.; Mar. to July, 1910, on supply car, Vancouver, B.C.; July to Sept., 1910, shipper, Vancouver, B.C.; Sept., 1910, to Feb., 1911, relieving storekeeper, Kamloops, B.C.; Feb. to Oct., 1911, storeman, Vancouver, B.C.; Oct., 1911, to Feb., 1913, tracing and pricing clerk, Vancouver, B.C.; Feb. to Apr., 1913, Storekeeper, Kamloops, B.C.

FRANCIS EDWARD RUTLAND, whose appointment as Agent, C.P.R. Stockyards, Winnipeg, was announced in our last issue, was born in Essex, Eng., Nov. 17, 1868, and entered transportation service about 25 years ago. Prior to coming to Canada, he was engaged in railway work in South Africa, during and after the Boer War. He entered C.P.R. service in 1904, since when he has been, to 1905, register clerk, Local Freight Department, Winnipeg; 1905 to 1907, chief correspondence clerk, same department, Winnipeg; 1907 to Nov. 6, 1913, chief clerk, same department, Winnipeg. He is a commissioner for oaths and notary public for Manitoba.

J. G. SUTHERLAND, whose appointment continental Passenger Association, who died at Chicago, Ill., recently, after a short illness, was born at Bothal, Northumberland, Eng., May 15, 1832, and commenced railway service there, Apr, 1847, since when he has been, to Mar., 1857, junior clerk, chief clerk, and cashier, Newcastle and Carlisle Ry., Newcastle upon Tyne, Eng.; Apr. 29, 1857 to 1870, assistant to chief clerk, Audit Department, in charge of statistics and freight accounts, and chief clerk, auditor and General Passenger Agent, Great Western Ry. of Canada, now part of the G.T.R. Since March, 1870, his service has been in the U.S., retiring from active railway work, Jan. 1, 1900, when he held the position of General Passenger and Ticket Agent, Chicago and Alton Rd.

JAMES CHARLTON, Chairman, Transas Car Service Agent, Alberta Division, C. P.R., Calgary, was announced in our last issue, was born at Aulac, N.B., Nov. 24, 1882, and entered railway service June, 1898, since when he has been, to Apr., 1901, operator and assistant agent, Intercolonial Ry. at various points; Apr., 1901, to June, 1902, operator, Pacific Division, and relieving agent, C.P.R., at various points; June, 1902, to May, 1906, dispatcher, C.P.R., Revelstoke, B.C.; May, 1906, to Feb., 1907, dispatcher, C.P.R., Calgary, Alta.; Feb., 1907, to Apr., 1911, dispatcher and acting Chief Dispatcher, C.P.R., Cranbrook, B.C., and Macleod, Alta.; Apr. to Nov., 1911, dispatcher and acting Chief Dispatcher, C.P.R., Calgary, Alta.; Nov., 1911, to Nov., 1913, Chief Dispatcher, C.P.R., Medicine Hat, Alta.

ALFRED H. SMITH, who has been appointed President, New York Central and Hudson River Rd., and Lake Shore and Michigan Southern Ry., New York, was born in the Western States in 1864, and has achieved all his railway experience with the New York Central Lines. He commenced service with the Lake Shore and Michigan Southern Ry. in 1879 as a messenger boy, subsequently transferring to the Purchasing Agent's Department, and later to the Engineering Department, under which he worked for several years as foreman and general foreman of construction on the change of grade and reconstruction of the line west of Toledo. From Oct., 1890, to Apr. 1, 1901, he was consecutively, Superintendent, Kalamazoo, Lansing, Franklin and Michigan Divisions; Apr. 1 to June 17, 1901, Assistant General Superintendent, Cleveland, O.; June 17, 1901, to Feb., 1902, General Superintendent; Feb., 1902, to July 1, 1903, General Superintendent, New York Central and Hudson River Rd.; July 1, 1903, to June, 1906, General Manager, same road; June, 1906, to Apr. 15, 1912, Vice President, same road; Apr. 15, 1912, to Mar., 1913, also Vice President, other N.Y.C. Lines; Mar. to Dec. 31, 1913, Senior Vice President, New York Central Lines in charge of operation, maintenance and construction.

JOHN WILLIAM PORTER, whose appointment as acting Chief Engineer, Hudson Bay Ry., Winnipeg, was announced in our last issue, was born at Aberdeen, Scotland, Oct. 15, 1877, and entered railway service in 1896, since when he has been, to 1902, pupil and assistant in office of Engineer in Chief, Great Northern Ry. of Scotland, Aberdeen; May, 1902, to Jan., 1903, draughtsman, Construction Department, C.P.R., Montreal; Jan. to Dec., 1903, draughtsman and transitman, C.P.R., Winnipeg to Fort William; Dec., 1903, to Mar., 1905, transitman, preliminary and location, C.P.R., Sudbury to Parry Sound, Toronto-Sudbury Line; Mar. to June, 1905, assistant chief of location party, Walkerton-Proton Line, C.P.R.; June, 1905, to Jan., 1906, Resident Engineer on Construction, Toronto-Sudbury Line, C.P.R., Alliston, Ont.; Feb. to May, 1907, Assistant Engineer, Georgian Bay and Seaboard Ry. (C.P.R.), Coldwater, Ont.; May, 1907, to May, 1909, Assistant Engineer, Toronto-Sudbury Line, C.P.R., Craighurst, Bala and Parry Sound, Ont.; Sept., 1909, to June, 1912, Division Engineer, District —, National Transcontinental Ry., Quebec, Que.; June, 1912, to Nov., 1913, Assistant District Engineer, District B, National Transcontinental Ry., Quebec, Que.

The total railway consumption of crude oil in 1912 is estimated at 32,000,000 barrels, an increase of 4,000,000 over 1911. The total mileage operated by fuel oil is 28,000 miles.

A Suit Over the Old Great Eastern Railway.

Some details of the early history of the old Great Eastern Ry. came out recently in the course of an action brought in the Quebec courts by Miss I. M. M. Campbell against the widow and administratrix of the late Hon. R. Prefontaine. The line was acquired by C. N. Armstrong in 1894, and subsequently an endeavor was made to settle the company's indebtedness, the creditors including Miss Campbell's father and Hon. R. Prefontaine, to whom $10,000 each were due. Mr. Armstrong and the creditors agreed to have the line sold, and bid in by the South Shore Ry. at $65,000. Mr. Prefontaine bought the railway, however, at auction for $505, and later on transferred it to the South Shore Ry. for $59,999, the S. S. Ry. turning over in payment certain subsidies from the Dominion and Quebec Governments. At the time of Mr. Prefontaine's sudden death in Paris, there was still due to him on account of the agreed on price, $22,035.55, with interest, which was subsequently paid when the South Shore Ry. was acquired, along with the Quebec Southern Ry., by Senator Beique for the Delaware and Hudson Co., and amalgamated as the Quebec, Montreal and Southern Ry. Mrs. Prefontaine, her husband having died intestate, is administering the estate under the terms of her marriage settlement. Miss Campbell sought to recover the $10,000 due to her father as one of the creditors of the old Great Eastern Ry., and Mrs. Prefontaine's counsel contended that she only had the usufruct of her deceased husband's property and personally could not pay out or alienate any portion of the property. The court upheld this contention, Dec. 7.

National Transcontinental Railway Bridges.

Between Moncton and Winnipeg there are 200 bridges having an aggregate length of 11 miles and a weight of 61,000 tons of steel; they cost more than $6,000,000. Some of the most interesting structures were mentioned by R. F. Uniacke, Bridge Engineer, N.T.R., in an address at the Canadian Railway Club recently.

Many of the bridges are plate girder viaducts, among which is the one over Little Salmon River. It is 100 ft. high, 4,000 ft. long and contains 7,000 tons of steel. In the Bostonnais River bridge, where the deck plate girders are supported on comparatively low concrete piers, the spans are tilted out of a horizontal plane so that the girder webs are slightly inclined to the vertical and provide without shimming for the superelevation of the outer rail on a curve.

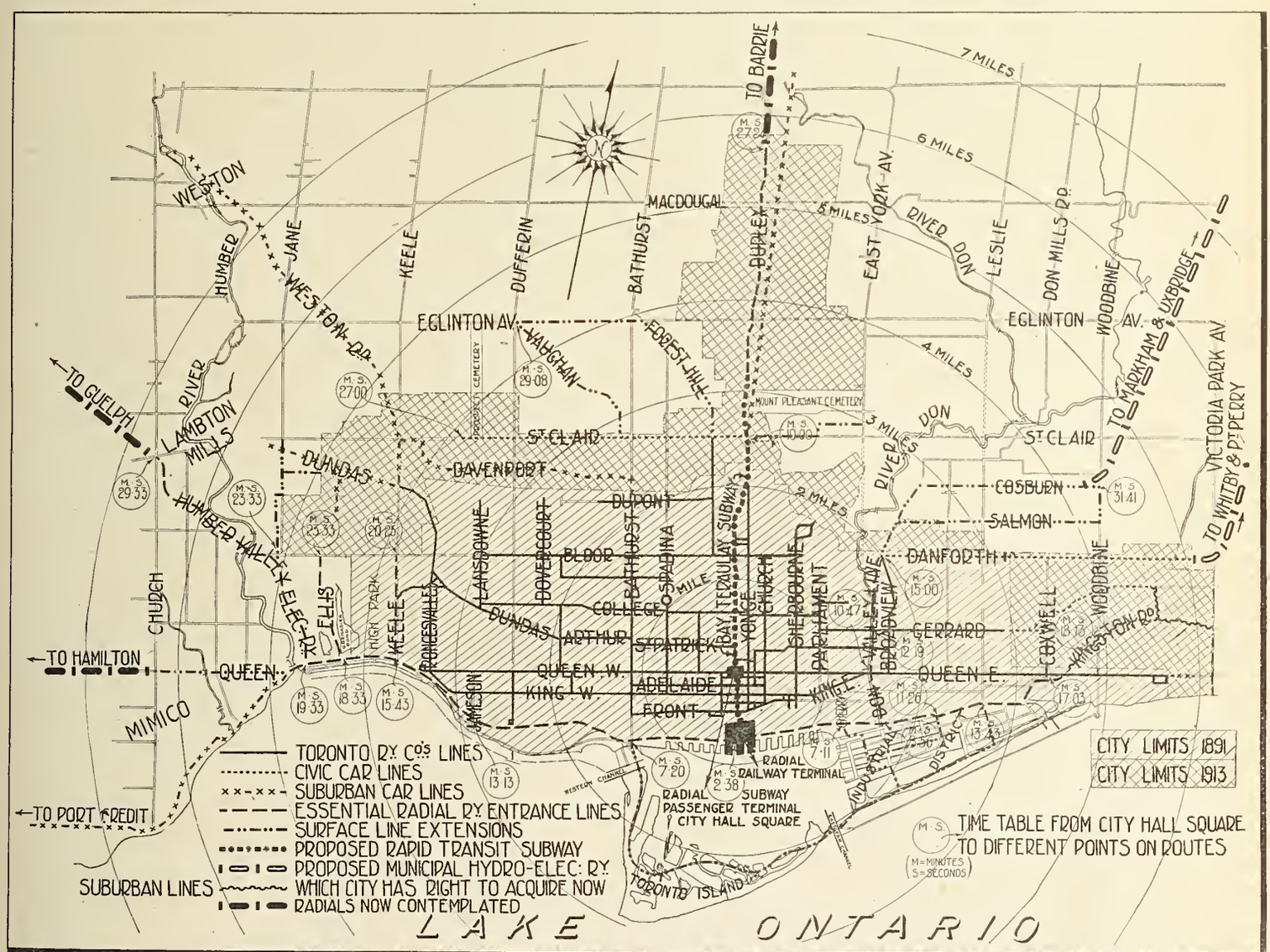
Falsework for the erection of the Bush River bridge truss spans and for the preliminary temporary support of a contractor's service track was made with the main bents capped at the proper elevation to support the chamber blocks for the trusses, and surmounted by centre pony bents to carry track stringers and rails and provide for a construction track in advance of the bridge erection.

The 80 ft. deck plate girder approach span of the Okekodaski River bridge was supported at the shore end on a concrete pier that was wrecked by transverse displacement. The sub soil was found to be unable to support the 15 ft. fill that had been retained by the abutment pier. Temporary repairs were effected by supporting the end of the span on timber cribbing until a permanent low steel trestle could be built to replace the embankment.—Engineering Record.

Electric Railway Department

Toronto Harbor Commissioners' Suggestions for Solving the Electric Railway Problem.

Another plan for the solution of the local transportation situation in Toronto has been submitted for consideration, this time by the Board of Harbor Commissioners, and the story of its inception and development is told in a report, with plan annexed, prepared by E. L. Cousins, Engineer to the Board, and reasons for its presentation to the public are given in a letter covering the report and plan, sent to the Mayor by L. H. Clarke, Chairman of the Harbor Commission.



In his report Mr. Cousins says: "The settlement of the viaduct question and the fact that as a result the Commissioners were enabled to secure control of the inner harbor front between Cherry St. and Bathurst St., together with the development plans of the Commissioners, has at last made possible with a reasonable expenditure the construction of a radial railway entrance from both east and west along the water front to a central radial railway terminal." The first point settled, according to the chairman's letter, was the location of terminals for the transfer of passengers and freight among the three different services—steamships, steam railways and electric railways. This was fixed at the water front between Bay and Yonge streets, and the necessity of providing adequate connection with the steam and electric railways in the city and converging thereon led to the preparation of these comprehensive plans.

The main feature of the proposal is to provide a waterfront terminal between Bay and Yonge streets, to be used by all passenger steamships entering the port, and to have provision for the distribution of the passengers to all parts of the city. To provide for this distribution, and on the other hand for the collection of passengers, it is proposed that there shall be a line along the waterfront, partly on land belonging to the Harbor Commission, partly by the city, and partly on the right of way of the Toronto and York Radial Ry., in process of acquirement, or which may have been acquired by the city, from the Humber River, to Victoria Park Ave., on Kingston road, and to have a branch from Bathurst St., across the Western channel to and along the Island to Ashbridge Bay, and connecting up again with the water front line. In the next place, it is proposed to build a subway or tube line to a central terminal at the City Hall, connecting there with the previously projected tube line to St. Clair Ave. This tube line it is proposed to extend to the old Belt Line Ry., then bringing it to the surface to extend it right to the northerly boundary of the city, about 5½ miles from the City Hall. The various surface lines proposed would connect up these lines with existing civic lines, or would open up new territory. In most cases they are not more than suggestions of possible lines, but are given by the Commission as being probably the most suitable.

The final point in the proposals has to do with the entrance of the radial lines now

converging, or projected to converge on Toronto. It is proposed that all these shall enter the waterfront terminal. These, with the proposed points of connection with the Commissioners' suggested lines are:—Toronto and York Radial Ry., Mimico Division, at the Humber River Bridge; T. and Y.R. Ry., Scarboro Division, at Kingston Road, if the section to Victoria Park Ave. be not acquired. T. and Y.R. Ry., Metropolitan Division, at St. Clair Ave. Toronto Suburban Ry.—Guelph line at Lambton Mills: Weston-Woodbridge line at St. Clair Ave., and Keele St. The proposed line from Hamilton it is suggested to connect with the extension of the line across the Humber Bridge along Queen St. West; the proposed Toronto, Barrie and Orillia Electric Ry. would connect with the surface line extension of the Terauley-Yonge St. subway; the proposed Hydro-Electric line to Markham and Uxbridge would connect with the surface line ending at Cosburn and Woodbine Avenues; while the proposed Hydro-Electric line to Whitby and Port Perry would be connected up with the Toronto Civic Car Line on Danforth Ave.

The plans are divided into two sections, the essential lines, covering 25.46 miles of double track, and certain surface line extensions which may be built as required. These lines, together with the estimated cost of the same, are as follows:

ESSENTIAL LINES.

EASTERN SECTION.—From the waterfront terminal between Bay and Yonge Streets, easterly to a connection with the Kingston Road division of the Toronto and York Radial Ry., 4.12 miles. It is suggested that the section of the T. and Y. R. Ry. to the city limits at Victoria Park Ave. be acquired. The estimates provide for the acquiring of this piece of line and reconstructing it as a double track line, with a branch to the Toronto civic car line on Gerrard St. A branch line from near Eastern Ave., via Coxwell Ave. A branch from where the main line crosses the Don, along the eastern bank of the river to the corner of Danforth Ave. and Don Mills Road. Estimated cost of these lines, $1,933,300.

NORTHERN AND CENTRAL SECTION.—From the waterfront terminal northerly to the central terminal station at Terauley St., by a subway, connecting there with the projected subway along Terauley St. and extension and Yonge St. to St. Clair Ave. At present there is a civic car line running west along St. Clair Ave for 3.12 miles. Subway extension to Old Belt Line, 2,300 ft., and a continuation as a surface line to the northern city limits, via Duplex Ave. Estimated cost, $7,703,550.

WESTERN SECTION.—From the waterfront terminal at Bay and Yonge Streets, westerly through the Exhibition Grounds by a subway, and out to the level of the G.T.R. at Sunnyside, along the Lake Shore Road on the right of way of the Mimico Division of the Toronto and York Radial Ry., to the Humber River. This piece of line is proposed to be taken over by the city, Jan. 1. From the Humber the line would turn northwesterly and follow the right of way of the projected Humber Valley Electric Ry., reaching Dundas St. at Lambton Mills. A branch line from the Lake Shore Road along Ellis Ave., or Windermere Ave., and other streets, to Bloor St. A branch line from the Lake Shore Road along Keele St., and through High Park, to Bloor St. Estimated cost, including the cost of acquiring the Sunnyside-Humber River section of the Toronto and York Radial Ry., $3,560,675.

Total estimated cost of essential lines, $13,197,524.

SURFACE LINE EXTENSIONS.

EASTERN SECTION.—From corner of Don Mills Road and Danforth Ave. along Don Mills Road to Fulton St., thence easterly to Woodbine Ave., north along that avenue to Cosburn St., and westerly along that street to Don Mills Road. From the foot of Bathurst St., across the Western Channel and along the Island to the Eastern Channel, to connect with the main line easterly, and with spurs serving the Ashbridge Bay industrial district. Estimated cost, $846,000.

CENTRAL AND NORTHERN SECTIONS.—Line easterly from Yonge St. to Eglinton. A line through Forest Hill and westerly along Eglinton Ave. to Dufferin St. A surface line from west of Bathurst St. to Eglinton Ave. at Dufferin St. Estimated cost, $669,750.

WESTERN DISTRICT.—Extension from the Humber River, along Queen St., west to Church St., Mimico. May, Jane and St. John's Road extension from Bloor St. to Dundas St. Estimated cost, $270,250.

Total estimated cost of surface line extensions $1,786,000.

Total expenditure called for by plans $14,983,525. This estimate is exclusive of cost of terminals.

The accompanying plan shows the existing city lines and radial lines, together with the proposed lines and the projected radial lines. Figures on the plan show the time required for transit from the City Hall to the various points indicated on the several proposed lines. No estimates have been made as to the probable receipts from traffic on the lines.

The Board of Control has referred the report and plans to the City Engineer and the City Solicitor for consideration and report.

Public Utilities Commissioner's Report on Winnipeg Electric Railway.

H. A. Robson, Public Utility Commissioner for Manitoba, issued a statement recently dealing with the City of Winnipeg's light and power department and also with the Winnipeg Electric Ry. Co. and two of its subsidiaries. Following are extracts:—

The Winnipeg Electric Ry. Co.'s fiscal year ends with Dec. 31. A copy of its statements in respect of its last year's business is submitted herewith. The company in filing these accounts stated that on account of its owning and operating the street railway and the power and light department as one concern, it was somewhat difficult to separate the accounts. It had made a separation of certain items for its own purposes, which separation was somewhat arbitrary, without having gone minutely into figures. The gas department is kept separate. The Suburban Rapid Transit Co. and the Winnipeg, Selkirk & Lake Winnipeg Ry. Co.'s report is also herewith. Certain of these accounts may require investigation for the purposes of pending applications for rate reductions. Shareholders and bondholders, in privately owned utilities, are entitled to apply for the setting up of depreciation reserves. Aside from rate questions and protection of securities there may be a public interest in the establishment of depreciation reserves in order to keep utility property up to condition. This is a matter open to be considered on an appropriate proceeding.

The following are the figures for 1912 for the street railway department:—

OPERATING REVENUES—	
Revenue from transportation	$2,152,729.60
Sundry earnings	21,611.48
Total revenue	$2,174,341.08
OPERATING EXPENSES—	
Transportation	$922,999.12
Repairs, buildings and plant	6,731.09
Repairs, equipment	111,639.65
Repairs, roadbed, track and overhead	46,591.65
Salaries and expenses	57,488.81
Total operating expenses	$1,145,490.32
Gross revenue	$1,028,890.76
Deductions from gross revenue—	
City of Winnipeg percentage on car license	$111,448.74
Percentage of fixed charges to capital invested	168,469.98
Total	$279,918.72
Net revenue	$748,972.04

The financial statement of the two subsidiary companies may be briefly summarized. That of the Winnipeg, Selkirk and Lake Winnipeg Ry. shows that the operating revenue for the year was $106,181, and the total operating expense, $52,648, leaving a gross revenue of $53,533. The interest on the funded debt and other miscellaneous expenditures was $44,033, leaving the net income $9,499. No dividend was paid on the common stock, the net income being carried forward. The assets are $1,127,609. The surplus of assets over liabilities is $36,908. The common stock is $111,500, and the funded debt is $400,000.

The Suburban Rapid Transit Co., working the line to Headingly, had an operating revenue of $59,060, and operating expense of $57,419, showing a gross revenue of $1,640. The interest on the funded debt was $25,000. The taxes were $1,606, leaving a net deficit for the year of $24,966. The deficit at the beginning of the year was $18,402, the total deficit at the end of the year being $43,469. No dividend was paid on the common stock. The assets of the company are given as $600,657, and the liabilities $644,026. The common stock is $100,000, and the funded debt in bonds $500,000.

Proposed Municipal Electric Railways in Western Ontario.

At a meeting of delegates representing the municipalities of the Counties of Wellington, Grey and Simcoe, interested in the building of an electric railway from Hespeler, through Guelph to various points on Georgian Bay, held in Guelph, Ont., Dec. 9, a resolution was passed emphasizing the need for the construction of such a railway; pointing out that the Hydro-Electric Commission of Ontario is eminently qualified for the carrying out of such a project; urging that the commission take the necessary steps to collect information as to the cost of construction, operation and the manner of financing construction, and promising the support and co-operation of the several municipalities "in the building up of such a hydro electric radial system as shall bring the greatest development, progress and prosperity to the whole Province of Ontario." Hon. Adam Beck, M. L. A., Chairman of the Hydro-Electric Power Commission, who attended the meeting upon invitation, said that engineers were going over the ground for various suggested lines, and only on the basis of any line becoming self supporting would the Commission undertake the responsibility of advising its being built. The municipalities would have to take the risk of the line failing to meet the cost of operation and sinking fund.

In connection with this project, an investigation is being made with a view of building an electric railway from London to St. Marys and Stratford, to be operated by power supplied by the Hydro-Electric Commission.

P. Pocock, Chairman of the Hydro-Electric Commission of the City of London, is reported to have made considerable enquiries into the matter, and committees have been formed in a number of the municipalities interested. A press report from St. Marys states that engineers of the commission have recommended that the section of the line from London to St. Marys be constructed, and that the St. Marys Town Council is considering submitting a bylaw to the ratepayers at an early date, granting the necessary franchise.

The Middlesex County Council passed a resolution, Dec. 6, asking the Hydro-Electric Commission to prepare plans and estimates for the building of an electric railway from London to St. Marys and Stratford, and the London City Council passed a similar resolution Dec. 9.

Press reports state that persons who are interested in the Merchants' Mutual Line, and other steamship interests, are having plans prepared for an electric line from Petrolia to Corunna, Ont., with lines radiating therefrom to Sarnia and other points.

It has been announced that the Pennsylvania Rd. will extend its electrified zone to Elizabeth, N.J. This is a step toward the electrification of the entire New York division, which will probably be accomplished within the next few years.

The Port Arthur and Fort William Electric Railway.

On Dec. 1, the Port Arthur and Fort William Electric Ry.. which for some years has been operated by a joint commission, passed under the direct and separate control of the councils of the two cities named, at the head of Lake Superior, each city taking over for operation under the direction of its own council, the portion of the line within its own borders. At the time the joint board was constituted the Fort William City Council acquired by purchase the portion of the old Port Arthur Electric Ry., within its borders, and since that date all capital expenditure on the lines has been made by the two cities, each on its own behalf. The order of the Ontario Railway and Municipal Board creating the joint commission provided that its existence might be terminated on Dec. 1, 1913, and that, if so terminated, for five years thereafter, only one fare should be charged on the system, that is, for a fare collected in Port Arthur a passenger should be carried to any point in Fort William, and contrariwise. By an arrangement made between the councils of the two cities no alteration in the officers in charge of operation, or of the schedule, were to be made during December, pending adjustment of various matters, and the settlement of questions as to future management. The only difference noticeable by the public, was that at the boundary point between the two cities, the conductors of the various cars operating on the main line change fare boxes.

The railway has a total length of just over 40 miles, and the two systems have a mileage of approximately 20 track miles each. The main line extends from a point in Port Arthur, about which a definite understanding has not yet been reached, to a point in Fort William. An eight minute service is maintained on this line from 6 a.m., until midnight, then every hour. Each city has full control of traffic in its own boundaries, collecting fares, within its own bounds, but as on this main line Port Arthur cars will run into Fort William, and the reverse, it has been arranged for a change of fare boxes to be made at the boundary.

Certain rolling stock was acquired from Port Arthur by Fort William at the time the joint commission was formed, and since then each city has purchased such rolling stock as was necessary to meet the requirements of traffic within its own boundaries. On Dec. 1, Port Arthur was in possession of 16 double truck and one single truck pay-as-you-enter cars, and 3 double truck and 2 single truck cars of the ordinary type, while Fort William owned 11 double truck and 1 single truck pay-as-you-enter cars, and 5 double truck cars of ordinary type. Fort William has on order 5 single truck, and three double truck pay-as-you-enter cars. The Fort William cars are now heated by electricity, but they are being fitted with ordinary heaters. Power for the operation of the entire line is supplied by Port Arthur, in which city the car repair shops, owned entirely by Port Arthur, are situated. Each city has its own car barns.

The joint commission consisted of two members nominated by each of the cities, and these four appointed a chairman, the chairman in 1913 being G. L. Matthews, Port Arthur. The operating officials at the time of the transfer were: General Manager, M. O. Robinson; Purchasing Agent, A. R. Herman; Master Mechanic, F. Philp; Road master, J. Dillon; Line Foreman, N. Kennedy. Prior to the appointment of the joint commission the line was managed for Port Arthur by Commissioners elected by the ratepayers.

The Fort William City Council passed a resolution, Dec. 5, appointing M. O. Robinson Manager of the city electric railway, at a salary of $125 a month, and on Dec. 8, the Port Arthur City Council passed a similar resolution appointing him Manager of the latter city electric railway at the same salary. He was General Manager of the entire line under the joint commission, and is now Manager of the two separate lines. The receipts of the two systems for the first two days of the separate operation are reported to have been as follows: Port Arthur—Receipts, Dec. 1, $319.80; per cent of total, 40.2; Dec. 2, $404,84; per cent, 41.7. Population, 18,500. Fort William—Receipts, Dec. 1, $473.90; per cent. of total, 59.8; Dec. 2, $560.66; per cent., 58.1. Population, 25,000.

British Columbia Electric Railway Percentage Payments in Vancouver.

A report was presented by the city auditors to the Vancouver City Council, Nov. 29, on the system of fixing the percentages paid by the British Columbia Electric Ry. to the city for suburban traffic. The auditors found that the percentages due the city, as reported by the company, on traffic within the old city limits, and on traffic within the annexed districts, where nothing was paid for the use of streets, were correct, but objection is taken to the system of calculating percentages, for traffic on various lines beyond these areas. The traffic on the particular lines is discussed in detail. As the result of a conference with the City Auditors, the company's officers agreed that the percentage in future shall be based on tests made of the traffic on the several lines affected every six months. Another question involved was in regard to settlers' tickets, of which during September 243,240 were used, the company's officers, while declining to withdraw from the position taken up that no percentage was due on this traffic, expressed a willingness to pay $1,200 a year on account of it. The arrangement in both cases begins Jan. 1, and will extend during the currency of the franchise in the city, which expires in 1919.

The Ottawa Electric Railway's Suburban Fares.

The Ottawa Electric Railway gave notice some time ago that on and after Dec. 1 an extra fare would be charged to all passengers riding from Holland Ave., the western limits of the city, to Britannia and intermediate points. As a result of an application filed with the Board of Railway Commissioners on behalf of the city, asking the commission to investigate the company's tariffs, and its alleged unwillingness to make any further extensions in the city before the expiration of the franchise in 1923, an order was issued restraining the company from putting the proposed increase in rates in effect before Jan. 1, and the application was subsequently withdrawn, on the understanding that the matter will be brought up again toward the end of the year. The company contends that since the one fare from any part of Britannia to Ottawa, a distance of about 6 miles, has been in effect the receipts have not been sufficient to pay the fixed charges of $50,000 on the $750,000 invested in the line. When the line was opened in 1900 an extra fare was charged from the city limits. Five years ago the extra fare was abolished and a fare or transfer from any part of the city was honored on the line. The district through which the line runs has become fairly well settled during the last five years, but the increase in traffic which resulted has not been sufficient to meet even the fixed charges.

Guelph Radial Railway Company's Report.

Following are extracts from the report for the year ended Sep. 30, 1913, of A. H. Foster, Manager Guelph Radial Ry, which is owned by the City of Guelph, Ont.:

Passengers carried, 1,192,129, an increase of 263,084 over 1912. Transfers issued, 153,012, an increase of 39,128 over 1912. The average fare is 3 4-5 c. with an increase of .022 per passenger car.

The extraordinary expenses for the year were approximately $706.00, which includes repairs to track on Wyndham and Woolwich Streets, and the strengthening and repairing of a pier on the Dundas Road bridge. The earnings, $49,816.99, show an increase of $11,415.40, or 29.7% over 1912. The expenses, $33,771.33, show increase of $3,208.93, or 11.05%. The net profits show an increase of $8,206.47, or 104.67%. The additions to real property were $16,937.87. The surplus profits are $29,654.11, an increase of $9,985.66 over those to Sept. 30, 1912.

PROFIT AND LOSS ACCOUNT FOR YEAR.

Earnings.		
Passenger receipts	$45,835.40	
Freight	2,909.66	
Advertising	405.05	
Rent	200.04	
Sale of power	43.75	
Interest and discount	174.26	
Rink receipts	167.85	
Park receipts	80.98	
		$49,816.99
Expenditures.		
Passenger operating	$11,809.49	
Freight	900.47	
Oil and waste	297.50	
Coal	280.54	
Painting	370.97	
Office salaries	1,511.50	
Stationery	265.85	
General expense	186.30	
Insurance	545.02	
Car barn maintenance	6,558.19	
Taxes	1,629.35	
Track	1,963.61	
Line	180.21	
Power house	224.74	
Park expense	924.05	
Hotel expenses and taxes	18.75	
Rink	181.78	
Power	5,757.71	
Legal expense	165.30	
		$33,771.33
Profits on operating		16,045.66
Written off for depreciation		9,654.11
Net profit		$6,391.55

Hours of Labor on Toronto Railway.

Jos. Gibbons, Business Agent, Toronto Railway Employes Union, has made an application to the Ontario Railway and Municipal Board in which he sets out Sec. 272 of the Ontario Railway Act as follows:—"The Board may regulate the hours during which conductors and motormen, employes of a street railway company, may be required or permitted to work, but in no case shall an employe be permitted to work more than six days in a week, or 10 hours per day, and whenever practicable and reasonable such 10 hours shall be performed within 12 consecutive hours."

The application then states that the Toronto Ry. has in operation schedules that do not comply with the regulations specified in this section, the day's work in some cases being spread over a period up to 17 hours, and he asks that the Board make an order directing the company to operate its railway in accordance with Sec. 272, and also an order limiting the hours during which employes of a street railway may be permitted to work on Sunday to eight hours, the said eight hours work to be performed in eight consecutive hours.

Pay-As-You-Enter Cars on London Street Railway.

Canadian Railway and Marine World for December contained a description of six single truck p.a.y.e. cars built for the London St. Ry. by the Preston Car & Coach Co., with a floor plan and an illustration of the steel underframe. We were advised early in December that two of the cars had been put in operation and that the public had taken to them without any difficulty and appeared highly pleased with them. We have received the following information in regard to them:—

Every bit of space in the cars is fully utilized. Putting the forced ventilation heater in the vestibule with the motorman, makes room for one more seat for three passengers and also additional standing room for three or four more. The floor of the car is built out over the floor of the front vestibule to a point in line with the small partition just back of the motorman. While it might appear that this would crowd the motorman quite a bit, it is found that he has ample room. The floor is slightly extended in the same manner in the back vestibule in order that the conductor may stand further into the vestibule and at the same time be on a higher level than the passengers entering and paying their fares, the conductor thus being in a more commanding position.

The register is mounted just over the middle window of the rear vestibule. It is operated by foot pedals with the lever running upwards through the pipe stanchion just to the left of the conductor when he is facing the fare box. The mechanism works a rod from the top of this stanchion overhead to the register. Double registers are used, recording cash fares and tickets on one dial and transfers on the other dial.

In the body of the car proper, lift windows with sash fixtures are used instead of the drop windows. This enables the using of the thin walls in the car, which in turn enables the aisle to be made of maximum width.

The sign on the end of the car shown in the accompanying illustration as "Dundas," is illuminated, having two lamps arranged in the brackets with reflectors just behind the sign. Any name and desired color can be used, thus avoiding any possible confusion of getting the right color with the right name. These signs are distinguishable by color several blocks away and by reading the word quite a reasonable distance. The signs are mounted close to the end of the car, so that they may be reached from inside the car when the window is lowered or by standing on a small step provided just beside the number. The signs can then be changed without having to climb on to the roof of the car. The side signs shown as "Short," and referring to a short line which is operated, are provided by slipping a small sheet iron sign into sockets which are attached to the window posts just between the runway for the lower sash and the shade. This sign might be perforated and colored glass used to correspond with the same routing color. An advantage of this sign is that it also shows the passengers inside just what car they are on.

A feature of the doors which is being tried, to prevent clothing or hands being caught when the door is being closed, is that the edge of the door is cut away 1½ ins. and the space filled up by a loop of soft rubber sheeting, which is not strong enough to injure the hands nor to hold clothing even should they get caught.

On putting the cars into service, the company inserted advertisements in the local papers, giving exterior views and floor plan of the car, showing entrance, fare box and exits, with the following reading matter, in which the co-operation of the public is asked to secure efficient working:—

To secure maximum convenience and comfort of passengers, and minimize the possibility of accidents, patrons are respectfully requested to co-operate in making the use of the cars a success, viz.:—By being prepared to enter and leave the car promptly. Entrance at rear door only. When boarding the car be careful that the conductor is not closing the door at the time you take hold of the handles. Please have fare ready, if possible, so that it may be dropped into box without having to stop in vestibule, causing it to become crowded. Transfers are to be requested and given when paying fare. By moving toward front of car. Safety and convenience were the first considerations in designing these cars; therefore the doors must be closed and the steps folded whenever the car is moving. Exits at rear of car and also at front. Use front exit if at all possible. Please do not stand in the vestibule nor smoke on these cars. When leaving the car and carrying parcels, leave the left hand free for use in holding on to the handles. The company is endeavoring to provide a safe and pleasant means of transportation. If passengers will assist by refraining from blocking the pasageway at the rear of the car, the success of the p.a.y.e car is assured. As the company and the passenger are equally interested in improving the service, your co-operation is earnestly requested."

London St. Ry. Cars, showing entrance and both ways out.

London St. Ry. Cars, showing signs and Closed Doors.

Extension Sought for the Windsor and Tecumseh Electric Railway.

The council of Sandwich East, Ont., applied recently to the Ontario Railway and Municipal Board to compel the Sandwich, Windsor and Amherstburg Ry. to build a belt line in connection with its subsidiary, the Windsor and Tecumseh Electric Ry. When the S. W. & A. Ry. Co. built the W. & T. E. Ry., 9.45 miles, after the original promoters had found they were unable to finance it, the S. W. & A. Ry. Co. purchased the franchises, stock, etc., of the W. & T. E. R. Co., a clause in the franchise from Sandwich East Tp. reads as follows: "That if, after three years of operation of the road, it paid, the company had then to complete a belt line between Tecumseh and Walkerville." The first line was built along the river and lake front, and the extension was to be built on a road a mile back, and would be approximately seven miles long. The council of Sandwich East Tp. has claimed for the past two years that the railway has been making lots of money, and that the extension should be built. The company contended that the line was not in that condition and that it was not under any obligation to build a belt line until the original line was on a paying basis. The township disputed the company accounts, although allowed access to the books and vouchers so that the same might be verified. The township did not take advantage of this offer but brought the matter before the Ontario Railway and Municipal Board which met in Windsor some time ago, and took the ground that if the township did not believe the company's records they would appoint independent auditors and, accordingly, Falls & Chambers, of Toronto, were appointed to make an audit. In connection with the report of the audit which verified the company's contention in every respect, the township again appeared before the Board, questioned the accuracy of the auditor's report and suggested the appointment of a railway expert to further investigate. The Board then adjourned the matter for two weeks to allow the township authorities to decide whether they would go to the expense of securing an expert's services or not.

The City of Saskatoon, Sask., recently received six complete cars from the United States, for operation on its municipal electric railway, but it is reported that four of the six have been returned as being defective in respect of material and finish, and not up to specifications. Two of the six were retained as cars were urgently required.

London and Port Stanley Railway Electrification.

The lease of the London and Port Stanley Ry., to the City of London, Ont., has been signed on behalf of the City Council, and the signing of the lease by the company, which is controlled by the city, has been authorized. The lease of the line to the Lake Erie and Detroit River Ry., which is the Ontario section of the Pere Marquette Rd., has been terminated, owing to the expiration of the lease, and the line has passed directly into the hands of the London City Council. Arrangements are being made with the P. M. R. for the operation of traffic over the line pending the electrification.

On Dec. 2, the City Council appointed a commission to operate the line, and to have charge of its electrification. The commission consists of four members, viz., Hon. A. Beck, M. L. A., minister in charge of the Hydro-Electric Commission for Ontario; P. Pocock, chairman of the Hydro-Electric Commission for the City of London; Alderman W. Spittal, and M. D. Fraser. The first two have been appointed for two years, and the two last for one year; all, however, are eligible for re-election. The commissioners, accompanied by the Mayor, H. J. Lambe, Engineer of the Department of Public Works, and others, made a trip of inspection over the line Dec. 8. On the special train carrying the party, the commission was formally organized as follows: Chairman, Hon. A. Beck; Vice Chairman, P. Pocock; Secretary, pro tem, W. Spittal. At Port Stanley, the commissioners were shown the warehouse, 190 by 30 ft., which is being erected there by the Dominion Government, for import business. The commissioners discussed with the Reeve of Port Stanley the question of the erection of a new station and other terminal facilities there. It is said that a proposition will be made to the ratepayers of Port Stanley to contribute $10,000 towards the cost of this work. The matter of station accommodation at St. Thomas was also discussed, and it was arranged to meet the St. Thomas City Council at an early date. So far as the work of reconstruction is concerned, the plans, it is stated, provide for the laying of new ties and steel in such a way that when it is decided to lay a second track it may be easily done. It is expected that tenders will be asked for the necessary work at an early date. Arrangements are being made for the continuance of the operation of the line by the Pere Marquette Rd. as at present, under which arrangement the Michigan Central Rd. obtains an entrance into London.

The line was formally handed over to the commissioners Dec. 9. Sanction to the leasing of the line to the London City Council is being asked from the Dominion Parliament.

The London and South Eastern Ry. was originally organized to build a line from London, Ont., south easterly to a junction with the Michigan Central Rd. It acquired a property in London, but never built any railway, and when the M. C. Rd. entered into an agreement to come into London over the London and Port Stanley Ry., the L. and S. E. Ry. leased its land to the M. C. Rd. for terminal purposes. The directors have granted an extension of the lease until the L. and P. S. Ry. is electrified, and a committee of the directors has been appointed to negotiate with the M. C. R. management as to future arrangements.

We are officially advised that the name of the commission having charge of the electrification and operation of the line will be the London and Port Stanley Ry. Commission. Plans for the electrification are being prepared by the engineers of the Ontario Hydro-Electric Commission. It has not been decided when tenders for the work will be invited.

Judgment in Grand Valley Railway Suit.

The case of Wood vs. Grand Valley Ry. Co. came before the Appellate Division of the Ontario Supreme Court, Dec. 16, on an appeal by defendant, Pattison, from judgment of a Divisional Court of Dec. 20, 1912. Action by business men of St. George to recover damages for breach by defendant of contract to make traffic arrangements with the C.P.R., whereby current competitive freight rates will apply as from Galt and other points to all points east and west in Canada in consideration of plaintiffs purchasing $10,000 first mortgage bonds of defendant railway company, and for repayment of amount paid by plaintiffs for said bonds. At the trial before Middleton, J., judgment was awarded plaintiffs for $10,000 damages, costs, etc. This amount was varied and reduced by the judgment of the Divisional Court that defendant appealed from, and otherwise appeal was dismissed by Divisional Court.

The following judgment was given Dec. 16: Appeal allowed. Order of Divisional Court discharged and judgment at trial vacated. Judgment entered declaring that respondent is entitled to recover from the railway company and the appellant the damages sustained by reason of the breaches of the agreement complained of, directing a reference to ascertain the amount. The appellants and the railway company to pay the respondent their costs up to and inclusive of trial. Reserving further directions and subsequent cost, except costs of appeal to Divisional Court and to this court till after report. No other costs or any costs of any appeal. Cross-appeal of respondent dismissed without costs.

Civic Running Rights Over Toronto Railway.

The City of Toronto has requested the Ontario Government to proclaim the statute giving the Ontario Railway and Municipal Board authority in regard to the regulating of running rights and interchange of traffic for the purpose of arranging running rights over certain of the Toronto Ry. lines, or for an interchange of passengers, in accordance with amendments to the Ontario Railway Act, made in 1912, for that purpose.

A bill was originally promoted to give effect to the desire of certain lines to make arrangements with other lines for running rights and interchange, but the provisions were later incorporated in the Ontario Railway Act, such clauses not to come into effect until proclamation. The clause under which the city desires to effect the arrangement referred to, provides that any railway corporation shall furnish reasonable facilities for running rights and interchange of traffic to any other contiguous railway, and where they fail to agree as to terms and conditions the Ontario Railway and Municipal Board shall have authority to settle the differences between them and to enforce its decisions. It is also provided that such provisions shall apply notwithstanding any exclusive franchise purported to be held by any company. It is stated that if the proclamation is made, a number of applications will be made by other railways for interchange and running rights, including the entrance of various radial electric lines into cities where they have not such powers at present.

An Alleged Fake Accident Case in London.

A case against the London Street Ry. and the Grand Trunk Ry. is set down for the January Assizes in London, Ont. The plaintiff, Charles Nickels, was supposed to have been one of those injured when the London St. Ry. car No. 98 ran into the side of a G.T.R. freight train at the interswitching crossing on Dundas St. East on July 24, about 11 p.m. He was removed to the Victoria Hospital, where he appeared to be suffering from several severe bruises and strains to the muscles of his shoulders and back. He was in the hospital about ten days. About the time he left the hospital a reporter of the London Advertiser, claimed to have discovered evidence showing that Nickels was not in the collision at all and that any claim for injuries he might make would therefore be a fake. This reporter claimed that Nickels had been several miles east of the city with another party, arranging to do some work building a silo or something of that nature and was at the time of the collision driving into the city with a Mr. Spettigue, that they were held up by the freight train and on the opposite side of the train from which the car came, that when the collision occurred, Nickels jumped out of the buggy and disappeared in the darkness. Spettigue is reported to have stated that he knew nothing about Nickels' whereabouts after he jumped from the buggy, but that he was certain that he could not have been in the collision. Nickels afterwards admitted to the London St. Ry's. superintendent that he had been out in the country and was with Spettigue in the buggy but declared that he was in the collision. He was unable, however, to state how he got from the buggy, to the other side of the train, and into the car in order to be in the collision.

The crossing where this collision occurred was beyond the old city limits, where there were no street lights whatever in the vicinity and hence the crossing was very dark. The street cars had been operated for a number of years over this crossing under an order of the Board of Railway Commissioners, permitting the free use of the crossing by the street railway cars and requiring freight train conductors whenever crossing, to go ahead and see that all was clear before doing so. It seems that in the case in question the trainmen did this but did not afterwards protect the side of their train, and in the darkness the motorman did not see the train in time to avoid running into it. Since the accident an investigation has been made for the Board and it is expected that an order will be issued to have the crossing protected by interlocking derails and semaphores as other street railway-steam railway crossings are usually protected.

American Electric Railway Association.—The following officials of Canadian electric railways have been appointed on committees: Taxation Committee: G. Kidd, British Columbia Electric Railway; Wilford Phillips, Winnipeg Electric Railway; J. D. Fraser, Ottawa Electric Railway; Patrick Dubee, Montreal Tramways Co.; J. W. Crosby, Halifax Electric Tramway Co. Committe on Way Matters: W. F. Graves, Montreal Tramways Co. Committee on Equipment: W. R. McRae, Toronto Railway.

D. McDonald, President of the Canadian Autobus Co., informed the Montreal City Council by letter, Dec. 12, that in view of the delays in improving the streets the company, which has ordered its autobusses, will be unable to commence running them until early in the spring.

Electric Railway Projects. Construction. Betterments. Etc.

Berlin and Waterloo St. Ry.—We are officially advised that the Berlin, Ont., City Council has laid 3,600 ft. of double track concrete foundation, and new steel on its line between Wellington St. to Union St. It is proposed to undertake about half a mile of concrete construction on the line from King St. to the G. T. R. station in the spring. The work will be done by the city staff. V. S. McIntyre, Berlin, Ont., is Superintendent. (July, 1913, pg., 344.)

British Columbia Electric Ry.—In connection with the proposal of Burnaby, Westminster and Coquitlam, B.C., townships, to build a bridge across the Brunette River, it has transpired that the B. C. E. Ry. has prepared plans for the building of a cut-off into Westminster on its Burnaby Lake line, which will have to be provided for. Several suggestions in connection with this projected line have been made, and will be considered by F. L. McPherson, the engineer engaged to prepare plans for the bridge.

A contract is reported to have been let to R. Shields, Vancouver, for building of an interlocking control tower, electrically controlled, at the crossing of the Esquimalt and Nanaimo Ry., hy the B. C. E. Ry. on the Esquimalt Road, Victoria. (Dec., 1913, pg. 592.)

Forest Hill Electric Ry.—Plans are reported to have been prepared for starting construction upon this projected line, early in the spring. The section to be built will start near the Toronto city limits on Forest Hill Road, run to Eglinton Ave., and westerly along that street to the old Belt-Line Ry. Property owners along the route are said to be aiding in financing the construction. (See also plan proposed by Toronto Harbor Commissioners.) (Sept., 1913, pg. 442.)

Halifax Electric Tramway Co.—Press reports state that a 500 k. w. motor generator set and other equipment for the railway generating plant is being installed in the power house at Halifax, N. S., by the Canadian General Electric Co. (May, 1913, pg. 237.)

Hamilton St. Ry.—We are officially advised that it is intended to build about 4.5 miles of new double track line during the present year. E. P. Coleman is General Manager, Dominion Power and Transmission Co., Hamilton, Ont. (Oct., 1913, pg. 494.)

Hull Electric Co.—We are officially advised that rails have been laid on the double track extension from Rivermead to the Jockey Club, at Connaught Park, 0.75 miles. (April, 1913, pg. 184.)

Lulu Island Line Terminus, British Columbia Electric Railway, Granville Street Bridge, Vancouver.
For description see Canadian Railway and Marine World, Dec., 1913, pg. 592.

Calgary Municipal Ry.—Press reports state that during this year the city council will let contracts for the building of about 10 miles of extensions of present lines. (Dec., 1913, pg. 592.)

The Edmonton Interurban Ry. Company has a charter from the Alberta Legislature to build lines from Edmonton, in various directions. It has laid track on a line from the city limits of Edmonton, to St. Albert, Alta., about five miles, upon which a self propelled gasoline electric car is being operated. There has been under consideration a piece of line to connect the southerly terminal of the line with the Edmonton Municipal Railway, about two miles, and it was expected to have this completed by Dec. 31. The officers of the company are: President, G. Barbeau; Vice President, J. H. Picard; other directors, M. Kimpe, J. H. Garispy, L. Bureau. The first three are directors of the French Canadian Mortgage Co., the President being a resident of Paris, France. Felix Lantellier is General Manager, and H. Warner, Chief Engineer. (Dec., 1913, pg. 592.)

Estevan Transit and Power Co.—The name of H. Nicholson, Estevan, should have been in our last issue along with the other provisional directors of this projected company. (Dec., 1913, pg. 593.)

International Transit Co.—Press reports state that plans are being prepared for the building of a line to connect the existing lines in Sault Ste. Marie, Ont., with Steelton, that the work will be done by the company, and that the rails will be supplied by the Lake Superior Corporation, which owns the I. T. Co.

Lacombe and Blindman Electric Ry.—Press reports state that about eight miles of grading have been completed out of Lacombe, Alta., toward Gull Lake and Rimeby, 30 miles. It is also reported that contracts have been let for ties and steel, etc., for the track laying, which it is proposed to go on with during the summer. It is also said that it is proposed to use gasoline electric cars on the line. E. R. Strathy, Winnipeg, is among the promoters. (Mar., 1913, pg. 141.)

London and Lake Erie Ry. and Transportation Co.—The Dominion Parliament is being asked to extend the time for the building of its already authorized line, to increase the bonding power from $25,000 to $30,000 a mile, and to authorize the building of the following additional lines: From Union in Yarmouth tp., to Sparta, from St. Thomas via Aylmer to Port Burwell. The St. Thomas, Ont., City Council, Nov. 25, granted the company permission to build a spur of 200 ft. on Wellington St., from which point it is to be extended across property belonging to the Michigan Central Ry. Permission was also given the company to run over the city's line on Wellington St., from Forest Ave., to connect with this spur, which is to be used for transferring freight from the L. E. Ry. and T. Co's. line to the M.C.R. (Dec., 1913, pg. 594.)

At a meeting of the ratepayers of Aylmer Village, and Malahide Tp., held at Aylmer, Dec. 9, a resolution was passed authorizing the councils of the two municipalities to negotiate with the company for the building of a line, on a satisfactory route, on the basis of a guarantee of bonds for $20,000 a mile for the mileage in their respective areas.

Medicine Hat Tramways, Ltd.—We have been officially advised that the action brought by E. J. Fagan for the purpose of quashing the bylaw, passed by the Medicine Hat, Alta., City Council, granting an extension of time to the Montreal Engineering Co., for the building of the projected electric railway in Medicine Hat, came before the courts at Calgary, Nov. 25. Judgment was reserved. (Dec., 1913, pg. 593.)

Montreal and Southern Counties Ry.—It is reported that the bonding and other work on the roadbed on the extension from Marieville to St. Cesaire, Que., nine miles, has been completed, and that it was expected to finish up the overhead work by the end of Dec., 1913. A station is being built at Rougemont, midway between Marieville and St. Cesaire. Construction will be gone on with all winter on the bridge across the Yamaska River, east of St. Cesaire, which it is expected to have completed in the spring. (Dec., 1913, pg. 593.)

Press reports state that a contract has been let to the Canadian General Electric Co. for a 300 k. w. motor generator set, a bank of transformers and the other equipment for the substation now under construction at Rougemont, Que.

Montreal Tramways Co.—The Montreal City Council has under consideration a report from the Board of Control on the proposals of the M. T. Co., and the Autobus Co., respecting an underground railway. The Council is asked to lay down certain general principles before proceeding to the discussion of details. (Dec., 1913, pg. 590.)

The new car line in Westmount which connects the upper and lower levels of the city was opened for traffic Dec. 10.

Application is being made to the Quebec Legislature for an act in the company's interest. Formal notice was given some months ago, hut the bill was not placed before the Legislature at the regular time. It is now printed and permission has been asked for the waiving of certain standing orders to enable it to be discussed. The chairman of the Legislature Committee on private hills is reported as stating Dec. 12, that the hill would ask for a 40 years extension of the franchise, and for the ratification of certain contracts with the city.

Nelson Street Ry.—Plans are being made, press reports state, for the betterment of existing lines, and for the building of some extensions during this year. (Aug., 1911, pg. 783.)

Niagara, St. Catharines and Toronto Ry.—Application is being made to the Niagara Falls, Ont., City Council, for an extension of the franchise in that city. (Dec., 1913, pg. 593.)

Ottawa and St. Lawrence Electric Ry.—Press reports state that it is likely that construction will be started on the Ottawa-Morrisburg section of this projected electric railway, in the spring. It is also stated that it has been determined to provide a

private right of way in Ottawa. (Nov., 1913, pg. 544.)

Ottawa Electric Ry.—The ratepayers of Eastview, Ont., will vote on a bylaw at the municipal elections in January, providing for the extension of the O.E.R. into the municipality, and for granting a bonus of $25,000 therefor. (May, 1913, pg. 235.)

Port Arthur-Fort William Electric Ry.—The Port Arthur, Ont., City Council decided, Nov. 25, that it will be necessary in the near future to extend the line from Current River to Hodder Ave. The ratepayers will vote at the municipal elections on a bylaw to issue debentures for $35,000 for street railway expenditures. The construction of the belt line has been completed, and it is expected that a regular car service will be put in operation over it at an early date. Press reports state that a proposition has been made to the Fort William, Ont., City Council for financing the building of an extension of the double track line on Victoria Ave., from near the Canadian Northern Ry. station along Victoria Ave., Edward St., and South Edward St. to a connection with the present lines in the west end. The City Council passed a bylaw, Dec. 5, providing for the expenditure of $238,000 upon the street railway, and for the taking of a vote of the ratepayers thereon, at the municipal elections in January. (Dec., 1913, pg. 593.)

Sandwich, Windsor and Amherstburg Ry.—Plans are under consideration, press reports state, to rebuild about a mile of the Windsor-Amherstburg, Ont. line, eliminating some curves. (Nov., 1913, pg. 545.)

Saskatoon Municipal Ry.—The Saskatoon Sask., City Council made a trip of inspection over the newly built line to Sutherland, Dec. 2. It is 4.5 miles long, and will be operated by the Saskatoon City Council under a 20 year franchise granted by the Sutherland Town Council. The latter has power to purchase the line on the expiration of the franchise at a price to be fixed by arbitration. (Nov., 1913, pg. 545.)

St. John Ry.—Press reports state that it is expected to have the line extended to Crouchvil e, N.B., by July 1, and that the company is willing to extend the line as far as Little River, provided the municipalities interested will strengthen the bridges. (Dec., 1913, pg. 593.)

Three Rivers Traction Co.—The Quebec Legislature has incorporated a company with this title to built electric lines in Three Rivers, Que., by arrangement with the City Council, and by arrangement with the various municipalities to Fond du Lac, Yamachiche, and other places in the counties of St. Maurice, Maskinonge and Champlain. The capital is fixed at $600,000, and the city of Three Rivers is authorized to and the company by the purchase of bonds and by granting of exemption from taxation, and a franchise for 20 years. The company is being formed in connection with the Shawinigan Power Co.

Toronto Eastern Ry.—The grading from Bowmanville, and through Whitby to Pickering, Ont., is reported to have been completed, and track laying is said to be well advanced. It is expected to have the line between these points ready for operation early in the spring. (June, 1913, pg. 287)

Toronto Civic Car Lines.—The new track laid on the city streets during 1913 in connection with the civic lines was as follows: Danforth Ave. line, Greenwood to Luttrell Ave., 4.09 miles; Coxwell Ave. line, Gerrard St. to Danforth Ave., 0.57 mile. The St. Clair Ave. line from Station St. to Yonge St., 6.28 miles, was completed at midsummer. It is proposed to build a track 0.34 mile long to the St. Clair Ave. car barn.

The Board of Control has under consideration plans for building a line from the St. Clair Ave. line southerly along Lansdowne Ave. to the C. P. R. crossing at Royce Ave.

Corporation Counsel Geary, in a recent report to the City Council said he hoped to be able to submit at an early date an agreement for the use of the Yonge St. line of the Toronto and York Radial Ry. within the city limits. (Feb., 1913, pg. 91.)

Toronto Ry.—The ratepayers of Toronto will vote at the municipal elections on a bylaw to provide by debentures $963,890.25 for the purpose of paying for reconstructing, repairing and renewing pavements upon portions of streets occupied by the company's right of way.

The Board of Control has been asked to consider the question of negotiating with the Toronto Ry. Co. for an extension of the Harbord St. line from its present terminus at Bloor St., northerly along Ossington Ave. to Hallam St., then west to Dufferin Ave., and along Lappin Ave., to a junction with the Lansdowne Ave. line.

Toronto Suburban Ry.—Grading operations were continued during December on the extension from Lambton to Guelph, Ont., the principal point being north of Meadowvale, where the line runs under the C. P. R. Credit Valley Branch. Some difficulty is being experienced there in getting foundations for bridges, owing to the nature of the soil. It was expected that the grading would be completed through to Eden Mills by Dec. 30. Track laying will be started as early as possible in the spring, and it is hoped to have the line finished by the fall. (Dec., 1913, pg. 593.)

Windsor, Essex and Lake Shore Rapid Ry.—The Board of Railway Commissioners has approved location and detail plans for a station building on Talbot Road, Maidstone, Ont. (Feb., 1913, pg. 93.)

Winnipeg Electric Ry.—Track is reported to have been laid on the Winnipeg, Selkirk and Lake Winnipeg Ry., owned by the W. E. Ry., to Stony Mountain, Man., eight miles from Stonewall, and the overhead work is said to have been completed. The line branches off from the main line to Selkirk at Middlechurch, and proceeds in a nearly straight line to Stony Mountain. The branch is 24 miles long and it is expected to have it finally completed and in operation during next summer. While it is said that the branch will be extended to Balmoral no definite agreement for a franchise has been reached. (Dec., 1913, pg. 593.)

We are officially advised that the press reports stating that a contract had been let for the development of the water power at Big Bonnet Falls on the Winnipeg River, by the Winnipeg Water Power Co., a subsidiary of the Winnipeg Electric Ry. Co., are incorrect. It is probable, however, that arrangements will be made in the near future. (Dec., pg. 589.)

The Grand Valley Railway and Brantford Street Railway Litigation.

The company having failed to pay to the city of Brantford $7,500, due for taxes, prior to Dec. 1, seven warrants for the seizure of the property of the Brantford St. Ry., covering real estate, movable assets, rolling stock, etc., were issued Dec. 2. The city, however, decided not to have them executed until after the hearing of the company's appeal against the recent decision of the Ontario High Court, reported in our issue of Oct., 1913, pg. 496, which is down for hearing in the Court of Appeal, at Toronto, at the current sittings.

The case came up for hearing at Toronto, Dec. 10, and the arguments were concluded Dec. 12, judgment being reserved. During the hearing the Chief Justice granted the Brantford City Council special leave to ask to have the order set aside authorizing E. B. Stockdale, the Receiver, the right to appeal, and to change the Receiver should it be shown that there was a conflict of interest between his interests as Receiver and as General Manager of the Trusts and Guarantee Co., the trustee for the bondholders. This matter was set down for hearing, Dec. 22, and the appeal of the G.V. Ry. against the order made for a distress warrant for $7,500 on account of taxes due the Brantford City Council was postponed until the same date. The case heard was the appeal of the G.V. Ry. against the decision providing for the forfeiture of the charter of the Brantford St. Ry., unless certain works on the way of betterment were done at once, and other works arranged for in the immediate future, and payment made of all sums due.

The Brantford City Council, Dec. 15, authorized the City Solicitor to make the necessary applications as authorized by the court.

The adjourned case, and the cases specially fixed for hearing in these matters, came before the Appellate Division, Toronto, Dec. 22. The court dismissed the appeal from the decision giving the city of Brantford permission to issue a distress warrant for taxes due in 1913. The specially entered case, viz., the city's application for the removal of Mr. Stockdale as Receiver of the company, was adjourned to Feb. 22.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry., and allied companies.—Gross earnings for October, $753,501; operating expenses, maintenance, etc., $561,902; net income $191,599, against $721,621 gross earnings; $515,813 operating expenses, maintenance, etc.; $205,808 net income for Oct., 1912. Aggregate gross earnings for four months ended Oct. 31, $3,014,355; net earnings $775,077, against $2,735,207 aggregate gross earnings; $787,214 net earnings for same period 1912.

Cape Breton Electric Co.—Gross earnings for October, $36,793.71; operating expenses and taxes $18,751.52; net earnings $18,942.19; interest charges $4,891.67; balance $13,150.52; bond sinking and improvement funds $1,190; balance $11,960.52, against $31,133.27 gross earnings; $16,339.61 operating expenses and taxes; $14,793.66 net earnings; $4,412.50 interest charges; $10,381.16 balance; $1,206.67 bond sinking and improvement funds; $9,174.49 net balance for Oct., 1912.

Dominion Power and Transmission Co. A dividend of 2% was paid Dec. 15 to shareholders of record on Nov. 30, on the limited preferred stock, which is entitled to a dividend of 10%, after which it becomes common stock. Dividends of 3½% have been paid on this stock, and it is anticipated that the remaining 6½% will be paid during the current year.

Hamilton St. Ry.—Gross receipts for quarter ended Sept. 30, 1913, $181,463.09, on which the $16,397 percentage has been paid to the city.

Lethbridge Municipal Ry. Earnings for November, $4,618.73, number of passengers carried, 111,618. Total earnings for 11 months ended Nov. 30, $53,576.17.

London St. Ry. Gross earnings for October, $27,791.58; expenses $20,465.62; net earnings $7,325.96; deductions $2,680.49; net income $4,645.47, against $25,668.78 gross earnings; $17,890.65 expenses; $7,778.13 net earnings; $2,450 deductions; $5,328.13 net income for Oct., 1912. Gross earnings for Nov. $26,347.73; expenses $18,-

692.06; net earnings $7,655.67; deductions $2,388.35; net income $5,267.32; against $25,442.85 gross earnings; $18,371.43 expenses; $7,071.41 net earnings; $2,371.25 deductions; $4,700.16 net income for Nov. 1912. Aggregate gross earnings for 11 months ended Nov. 30, $302,489.05; expenses $213,651.19; net earnings $88,612.86; deductions $26,876.08; net income $61,736.78, against $278,217.98 aggregate gross earnings; $192,203.29 expenses; $86,014.59 net earnings; $26,461 deductions; $59,553.69 net income for same period 1912.

Mount McKay and Kakabeka Falls Ry.—A committee has been appointed by the Fort William, Ont., City Council to meet the directors of the company with a view of discussing the purchase of the line.

Montreal Tramways Co.—The amount recently received by the Montreal City Council for percentages during 1913 was $500,934.55, compared with $409,510 for 1912.

Nelson St. Ry.—At a conference recently between the directors of the Nelson St. Ry. Co., and the City Council of Nelson, B.C., it was decided that the railway be operated under municipal control, with the present shareholders retaining their financial interest on a proportionate partnership basis. It is proposed to increase the number of shares by 25,000, making 75,000 in all, of which, the city is to acquire 40,000, thus getting control of the property.

Niagara Falls Park and River Ry.—See International Ry.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for October, $861,235; operating expenses, maintenance, etc., $415,021; net earnings, $446,214, against $754,104 gross earnings; $371,485 operating expenses, maintenance, etc.; $382,619 net earnings for Oct., 1912. Aggregate gross earnings for ten months ended Oct. 31, $8,044,705; net earnings $3,999,218, against $6,975,148 aggregate gross earnings; $3,567,719 net earnings for same period 1912.

Toronto and York Radial Ry.—The ratepayers of Toronto are being asked to authorize the issue of debentures for $89,393 to provide for the purchase of the old Toronto and Mimico Electric Ry., from Sunnyside to the Humber River, a part of the Lake Shore Division of the T. and Y. R. Ry.

Winnipeg Electric Ry.—Gross earnings for October, $357,313; operating expenses $196,703; net earnings, $160,610, against $321,039 gross earnings; $170,073 operating expenses; $150,966 net earnings, for Oct., 1912. Aggregate gross earnings for ten months ended Oct. 31, $3,338,748; net earnings $1,496,985, against $3,058,592 aggregate gross earnings; $1,431,714 net earnings for same period 1912.

The Proposed Purchase of the Toronto Railway.

D. M. McIntyre, Chairman of the Ontario Railway and Municipal Board, has according to a statement in the daily press, informed Corporation Counsel Geary that it is the intention of the Board to procure the assistance of an adviser thoroughly versed in street railway transportation to report on the city's application for new lines. This will be done when the pending construction on the lower city streets is completed and the new routes established, allowing a reasonable time to elapse to determine their effect upon the operation of the system, and to ascertain, in particular, the extent to which such routing will relieve the congestion in the downtown districts during the rush hours. The letter adds that the Board could not any longer ignore the pending negotiations between the city and the company for the purchase by the former of the company's undertaking. Under such circumstances, it is suggested that the status quo should be maintained until a determination of the negotiations one way or another.

At a meeting of the Board of Control, Dec. 17, a motion was carried by three votes to two, to notify the Toronto Ry. Co. that the city will not proceed, with any further negotiations for the purchase of the property, but the City Council decided Dec. 22, to proceed with the negotiations.

The Toronto Rapid Transit Association has been formed with the objects of agitating for an extension of the powers of the Ontario Hydro Electric Commission, to include the purchase, construction and operation of a complete provincial system of rural and urban electric railways; to secure the elimination of private ownership of the supply of electric light, heat, power and traction; to defeat the proposed purchase of the Toronto Ry. and Toronto Electric Light Co., and to support the speedy construction of a rapid transit system by the city with connections to the suburbs, and the necessary terminal facilities. J. F Ellis and A. W. Wright are respectively, temporary chairman and secretary.

Personal Paragraphs.

W. H. MUNRO, Local Manager, Peterborough Radial Ry., has been elected Secretary-Treasurer of the Trent Valley Water Conservation Association, which has been formed in the Trent Valley district of On-

J. W. MOYES, of Toronto, the promoter of the Ontario West Shore Ry., has been employed by the City of Toronto recently to report on the relative cost of operation of electric cars and motor busses.

J. B. SUNDERLAND has resigned from the Comptroller's Department, British Columbia Electric Ry., in which he has been engaged for the last five years, to take charge of the agency department of McDonald, Marpole & Co., Vancouver, B.C.

A. B. CORYELL has been appointed Superintendent, Electric and Tramway Department, Moncton Tramways, Electricity and Gas Co., Moncton, N.B., vice H. N. Price, resigned. Mr. Price has not been transferred to Pittsburgh, Pa., as intimated in the local press.

Electric Railway Notes.

The Hull Electric Co. has ordered two 800 k. w. transformers for its plant at Deschenes, Que., from Canadian General Electric Co.

The Hull Electric Co. has ordered four 43 ft. semi convertible, single end trailer car bodies, from the Ottawa Car Manufacturing Co.

The Port Arthur Electric Ry. has ordered one 21 ft. single truck, semi convertible, p.a.y.e. car body from Ottawa Car Manufacturing Co.

The Montreal Tramways Co. has ordered a standard double truck combination locomotive and snow sweeper from Ottawa Car Manufacturing Co.

The Toronto Suburban Ry. has received two single end, single truck, p-a-y-e city cars from the Preston Car and Coach Co. The T.S.R. is installing its own equipment.

The Fort William Electric Ry. has received one standard single truck snow sweeper, with Westinghouse 101 B2 equipment, complete, from Ottawa Car Manufacturing Co.

The Brandon (Man.) Municipal Ry. has received a standard single truck, double end, long broom snow sweeper, with Westinghouse 101 B2 equipment, from the Preston Car and Coach Co.

The British Columbia Electric Ry. has received four single end, double truck city cars, with Westinghouse 101 B2 equipment and Westinghouse straight air brakes, from the Preston Car and Coach Co.

The British Columbia Electric Ry. has announced that the name of its station situated on the Hastings townsite on its Burnaby line will be Horne-Payne, after R. M. Horne-Payne, the Chairman of the company.

The Saskatoon (Sask.) Municipal Ry. has received six double end, double truck, p-a-y-e city cars, mounted on standard trucks, with Westinghouse 101 B2 equipment, Westinghouse straight air brakes, from the Preston Car and Coach Co.

We are advised that the self-propelled car built at Burton-on-Trent, Eng., for use on the Edmonton Interurban Ry., at Edmonton, Alta., has not yet been delivered. The car being operated on the line has been obtained from another source.

The Fort William Electric Ry. has on order with the Ottawa Car Manufacturing Co., five single truck and four double truck p-a-y-e cars, all of steel construction. Four have been delivered, and the remainder will follow early in the year.

The Port Arthur, Ont., City Council was advised recently by the joint board then operating the street railway service of Fort William and Port Arthur, that it should purchase four additional single truck cars at once in order that an efficient service might be given on the recently completed belt line in Port Arthur.

The London, Ont., City Council decided, Dec. 1, that a vote be taken at the municipal elections in January, as to the operation of electric cars in the city. Under an Act of the Ontario Legislature a vote on this question can only be taken in places of over 50,000 population, and a certificate that London has this population has been given by the Ontario Government.

The British Columbia Electric Ry. has announced that tickets will be issued at single fare for the double journey for young people attending school from points on the recently opened line from Victoria up the Saanich Peninsula. The minimum fare will be 5c. Books of tickets will be issued, but they will not be available on Saturdays, Sundays, or school holidays.

The Toronto City Council passed a resolution Dec. 2, instructing the City Solicitor to apply to the Lieutenant-Governor-in-Council for a proclamation putting in force the statute passed in 1912 amending the Ontario Railway Act, with reference to the interchange of traffic and running rights between electric street railway systems owned or operated by different corporations lying contiguous to one another.

The Windsor, Essex and Lake Shore Rapid Ry. has ordered two interurban passenger cars from Tillsonburg Electric Car Co. Following are the chief particulars:—Seating capacity, 62; length over body, 44 ft.; length over bumpers, 55 ft.; width over all, 9 ft. 1½ ins.; interior trim, polished bronze; roof, monitor deck style; bottom frame, composite wood and steel; interior finish, oak; couplers, radial.

The Toronto Board of Control has recommended to the City Council the appointment of a Traction Commission to have charge of all the transportation interests of the city. It is proposed to have a commission of three, serving without salary, and at the

commencement, appointed for varying terms, so that eventually each member will serve three years, one retiring each year. The City Council to retain the power of veto over the actions of the commission.

The two cars which the Dominion Power and Transmission Co., Hamilton, Ont., recently received from Tillsonburg Electric Car Co., of which mention was made in a previous issue, are 51 ft. long over all, 49 ft. long over body, and 9 ft. wide over all. The bottom frame is composite wood and steel, the roof of the freight car type, with interior finish of chestnut and interior trim of polished bronze; the trucks are equipped with extra heavy rolled steel wheels, and the couplers are M.C.B. standard.

The Sandwich, Windsor and Amherstburg Ry. was sued recently for penalties for alleged breach of contract by the Walkerville, Ont. Town Council, and when the case came on for hearing the county judge dismissed it on the ground that it had not been shown that the town had suffered damage. The case was appealed, and the Appellate Division of the Supreme Court of Ontario gave judgment Dec. 16, reversing the previous decision, and giving the town $1 damages and costs.

The London St. Ry. reached an agreement with the City Council of London, Ont., Dec. 11, as to the operation of street cars in the city on Sundays in the event of the ratepayers voting in favor of the bylaw at the forthcoming municipal elections. The cars will be operated for eight months in the year on Sundays from 8 a.m. to 10.30 p.m., and during June, July, August and September from 8 a.m. to 11 p.m.; with fares at 5c. cash, tickets seven for 25 cents, and children's tickets two for five cents, with transfers applying to all.

In a recent decision dismissing the action of the owner of a horsedrawn vehicle for damages caused by the vehicle being knocked over by one of the Montreal Park and Island Ry. cars the judge stated that while those in charge of cars must take every means to render their operation as little dangerous as possible, it must not be forgotten that the cars are a public necessity, and the inconveniences arising from their operation, which are reasonably necessary for their efficiency, must be submitted to. The cars have the right of way on their tracks, and it is the duty of others using the streets to respect that right of way.

A proposition is under consideration by the Vancouver, B. C., City Council for the operation of a motor bus service in the city. The applicants for the franchise are: F. Buscombe, J. G. Woods, J. Martin and J. Weart. No decision has been reached, but it was pointed out that the council some time ago had decided to make application to the Legislature for power to operate motor busses, or to give franchises for such a purpose. A similar application has been made to the New Westminster City Council.

The Cape Breton Electric Co. has applied to the joint local municipal bodies for approval of a fender with which its new double truck cars have been equipped, and which is of a different type to that already approved. E. L. Milliken, General Manager, stated that it was only a matter of form to have the fender approved by the different municipal bodies, but strictly speaking the company was breaking the law, when during the rush hours cars were operated with the different type of fender on, and the law would also be broken if the cars were run without a fender. The company operates cars in Sydney and North Sydney, N.S., and on the Sydney and Glace Bay Ry., out of Sydney.

The Imperial Privy Council, Dec. 12, declined to hear an appeal case in the matter of damages for personal injuries received by one Bastien against the Montreal Tramways Co. The amount involved was comparatively small, but application was made that the appeal be heard, as there was a principle involved which would affect a number of other cases. The injuries were caused to Bastien by a street car belonging to the M. T. Co., but it is alleged on behalf of the company that the actual cause of the accident arose from the neglect of the Montreal City Council in not having the streets in a proper state of repair. The Lord Chancellor stated that the court, while fully appreciating the importance of the questions arising, did not feel, having regard to the amount of damages involved, that it was a case for hearing before that tribunal.

Electric Railway Track Laid in 1913.

Below is a table showing track laid on electric railways in Canada during 1913. The table is not published as a complete one, owing to the fact that some of the companies have not replied to the circular sent, but it is believed to be approximately correct. The * mark indicates that the figures given are estimated.

	Miles.	Miles.
*British Columbia Electric Ry.—		
Extensions in Vancouver		
New Westminster and Victoria		28.00
*Calgary Municipal Ry.—		
Various extensions		10.00
Edmonton Interurban Ry.—		
Edmonton to St. Albert		5.00
Edmonton Radial Ry.—		
Various lines		21.115
Hull Electric Ry. (1).—		
Rivermead to Connaught Park		0.75
Montreal and Southern Counties Ry.—		
St. Lambert to M. & S.C. Jct.	4.00	
M. & S.C. Jct. to Marieville	18.00	
		22.00
Montreal Tramways Co.—		
Various extensions		3.84
Niagara, St. Catharines and Toronto Ry.—		
St. Catharines to Niagara on the Lake		12.20
Ottawa Electric Ry.—		
Extensions		2.75
Quebec Ry., Light and Power Co.—		
St. Malo Ward	0.25	
Limoilon Ward	1.59	
		1.84
Regina Municipal Ry.—		
Extensions of City System		14.50
St. John Ry.—		
Extensions in St. John, N.B.		1.50
Toronto Civic Car Lines—		
Danforth Ave. Line	4.09	
Coxwell Ave.	.57	
		4.66
*Toronto Eastern Ry.—		
Bowmanville to Pickering		20.00
Toronto Ry.—		
Extensions of various lines		2.21
Winnipeg Electric Ry.—		
St. Boniface to St. Vital	2.00	
Through Fort Garry	5.37	
Various city extensions	6.61	
		13.98
Winnipeg, Selkirk and Lake Winnipeg Ry.—		
Middlechurch to Stony Mountain		9.77
Total		164.115

The London St. Ry. laid 0.70 miles of second track on existing lines; the Galt, Preston and Hespeler Ry. laid some sidings.

So far as construction for the current year is concerned we have been officially advised by six companies that they have under contract or survey, 47.70 miles of new track, and subject to confirmation we understand that four other companies have under consideration about 20 miles of new lines. These figures are altogether apart from the lines under construction by the Toronto Suburban Electric Ry.; the projected extension of the Toronto Eastern Ry.; the electrification of the London and Port Stanley Ry., and the projected lines out of Toronto under the Ontario Hydro Electric Commission.

The Canadian Northern Telegraph Co. has closed its offices at Vista, Man., and has opened offices at Salines, Ont., and Highland, Alta.

Telegraph, Telephone and Cable Matters.

W. J. Camp, Assistant Manager, C.P.R. Telepraphs, Montreal, lectured before the Montreal Electrical Society, Dec. 1, on the telegraph system.

The Board of Railway Commissioners has extended the time, to July 1, for approval of telegraph tolls of C. P. R., Canadian Northern Telegraph Co., Great North Western Telegraph Co., White Pass and Yukon Route and G.T. Pacific Telegraph Co.

The Canadian Northern Telegraph Co. has opened telegraph offices at Cereal, Chinook, Hanna, Oyen and Youngstown, Alta., and telephone offices at Lakeland and Langruth, Man., Pleasant Valley, Pathlow and St. Brieux, Sask., and has closed its telephone offices at Cereal, Chinook and Richdale, Alta.

On the completion of the wireless telegraph stations at Port Burwell, Toronto Island and Kingston, which it is anticipated will take place this winter, Canada will have the longest single stretch covered by wireless telegraphy, in the world, viz., from Port Arthur, Ont., to Cape Race, over 2,000 miles.

The C.P.R. Telegraph Department, which has been operating two duplex Morkrum printer circuits between Montreal and Toronto during the past year, has placed another similar circuit in operation between Montreal and Ottawa, and another will shortly be installed for use between Montreal and Quebec.

J. McMillan, General Superintendent, Western Lines, C.P.R. Telegraphs, announced in Winnipeg Dec. 11, that the following additional telegraph lines have been erected during the past season,—Manitoba Division, —1,065 miles of copper wire, 90 miles of iron wire, and 151 miles of train dispatching telephone circuit; Saskatchewan Division,—525 miles of copper wire, and 617 miles of copper wire and 90 miles of iron wire along new lines; Alberta Division,—1,650 miles of copper wire, 713 miles of iron wire and 508 miles of railway equipped with train dispatching telephone circuits, and 250 miles of wire along new lines.

It is announced that the Western Union Telegraph Co. will shortly re-start business in Alberta, under an arrangement with the Alberta Government. The company at one time had an office at Lethbridge, and operated over the Alberta Ry. and Irrigation Co's. lines, but on the absorption of the A. R. & I. Co. by the C.P.R., the Western Union retired from the Province. It is stated that the telegraph operators intend to petition the Government not to enter into an agreement with the W.U.T. Co. unless the company agrees to pay a fair wage scale and abolish what are alleged to be black list methods.

B. S. Jenkins, who recently retired from the position of General Superintendent, C. P.R. Telegraphs, Winnipeg, was entertained there, Dec. 10, by the telegraph staff, including representatives from various points on the whole system. He was presented with a silver tea service and an illuminated address. He commenced his telegraph service with the Montreal Telegraph Co., at the age of 15, and later was engaged with the Dominion Telegraph Co. in Ontario, and subsequently returned to the Montreal Telegraph Co. He entered C.P.R. service in 1881 at Winnipeg, as an operator at Winnipeg Jct., when his telegraph office was a box car which had been used for cattle. He was later moved to Ossowo and Birds Hill, and to Winnipeg Jct., and was afterwards Superintendent of the commercial telegraph service at Winnipeg, on its inception, Sept. 1, 1883.

Marine Department

The Ocean Freight Rate Question.

By H. L. Drayton, K.C., Chief Commissioner, Board of Railway Commissioners.

Through the courtesy of Hon. G. E. Foster, M.P., Minister of Trade and Commerce, we are enabled to give the full text of the report presented to the Dominion Government by Mr. Drayton, on his recent visit to England in connection with the question of ocean freight rates, as follows:—

Acting on the instructions contained in a report of a meeting of the Privy Council, approved by the Administrator on July 19, 1913, I proceeded to England with the object of discussing with the Imperial authorities the question of governmental control of the charges made by the shipping companies to the public for the carriage of ocean borne freight. The question was one which had already engaged the attention of the Board of Trade of Great Britain, the conclusions that that Board arrived at being included in the communication from the Marine Department of the Board of Trade to the Under Secretary of State, Colonial Office, on Aug. 4, 1910. The material part of the conclusion is as follows:—

"While, for the above reasons, the Board would see great difficulty in the establishment of a joint tribunal for the control of ocean freight rates, they direct me to call Lord Crewe's attention to the recommendation made by the Royal Commission on Shipping Rings in paragraph 332 of their report, that to meet the possibility of cases arising where public interests may be grievously affected either by the checking of a trade or by its more or less permanent diversion, the Board of Trade should have power to appoint competent persons to investigate the matter. There seems no reason why His Majesty's Government should not discuss with the Canadian Government the question of holding a joint inquiry into the rates charged and the facilities afforded by the shipping companies engaged in the trade between United Kingdom and Canadian ports, either on the lines of the recommendation of the Royal Commission or on the lines of the inquiries provided for in the Combines Investigation Bill, which it is understood has passed through the Canadian Legislature."

In view of the conclusion arrived at by the Board of Trade, a preliminary joint investigation, such as above suggested, was essential. The scope of such an enquiry of necessity would cover the whole situation, so as to enable the commissioners appointed for the purpose to determine whether the rates charged and facilities afforded by the shipping companies engaged in the trade between the United Kingdom and Canada were such as to require some form of governmental control or not. With this end in view, I endeavored to obtain the appointment of a joint commission to make a thorough and complete investigation of, and to report on the methods and practice, and rates and charges of ocean carriers doing business, or from time to time doing business, between ports in the United Kingdom and ports in Canada; and also of all terminal companies or port authorities of any port in the United Kingdom or in Canada through which traffic, whether of passenger or freight, between the United Kingdom and Canada passes; and also to investigate into and report on all insurance charges or other expenses that shippers from the United Kingdom to Canada, or vice versa, are subject. I further represented that the commission, in addition to reporting its findings in the above matters, should also recommend what, if any, legislation it deemed advisable should be passed by the Imperial Parliament, or by the Dominion Parliament, or by both. I further represented that it was necessary that the commission should have authority to sit at such places it might desire, either in the United Kingdom or in Canada, with authority to compel the attendance of witnesses, production of documents, books, papers, etc., and to administer oaths; and also that the commission should have the right to employ accountants, traffic experts, clerical and other assistance. I further impressed upon the Imperial authorities that it was the desire of the Canadian Government that the investigation should be entered on in the near future, and, if possible, a report made so as to enable any necessary action to be taken by that government at the ensuing session of Parliament. In support of the necessity for an investigation, I relied upon the admitted fact of large increases in rates and the falling off of the ratio of imports from Great Britain to Canada, as well as the large increase of cost to the British consumer certain increases in rates in part

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H. L. Drayton, K.C.
Chief Commissioner, Board of Railway Commissioners for Canada.

worked, the particulars of which I do not now venture to trouble you with. It will be noted that the investigation as asked was not confined to the freight situation merely, but also covered passenger traffic. In case there could be any exception taken to my request for an investigation on that score, I pointed out that no complaint was made at the instant in so far as passenger rates were concerned, but that, in order to arrive at what a fair, adequate and reasonable freight rate should be, the sources of revenue, with the expense common to both services, should be considered, and a proper allocation made of expenses so as to distinguish that part fairly chargeable to freight and that fairly chargeable to passenger traffic. This, of course, could not be done unless the passenger figures were placed before the commission of enquiry.

In addition to discussing the matter with the Imperial authorities, I also had the opportunity afforded me of meeting the representatives of the different lines that are in conference with each other, and of hearing a statement of their position. As a matter of fairness to the companies, it is only due to state that the expense of carrying on a business in some particulars has very largely increased, so that a certain advance would undoubtedly be reasonable if the previous rates only afforded fair returns to the operating companies.

The action taken by the Board of Trade is shown in the following letter:—

"I am directed by the Board of Trade to refer to the discussion which took place on Aug. 22 between yourself and representatives of the Board and the Colonial Office on the subject of ocean freight rates, and I am to state that the Board of Trade have carefully considered the arguments and suggestions advanced by you at that discussion.

"The offer of co-operation in a joint inquiry which was made in a letter from Lord Crewe to the Governor-General of Canada on Aug. 19, 1910, appears to have met with no response from the Canadian Government until now; but on April 15, 1912, in pursuance of a resolution passed by the Imperial Conference of 1911, on the motion of the Canadian Prime Minister, a joint Royal Commission was appointed, representing the Dominion and the United Kingdom, in whose terms of reference the question of shipping freights was clearly included. Further, at the meeting of the Imperial Conference at which the resolution moved by the Prime Minister of Canada was under discussion, the question whether the subject of shipping arrangements and means of transport, etc., would be included in the reference to the commission was expressly raised by the Prime Minister of Australia and was answered in the affirmative by the President of the Imperial Conference.

"Since their appointment the Royal Commission have visited Australia and New Zealand, and have taken evidence on the subject of freight rates in relation to trade between the United Kingdom and those Dominions.

"In these circumstances, the Board, after consultation with the Secretary of State for the Colonies, feel that it would not be possible at the present stage to advise His Majesty's Government to appoint a second Royal Commission representing Canada and the United Kingdom only, to investigate a subject which the Royal Commission on the Trade of the Dominions are already examining and on which it is understood that this commission will very shortly be taking evidence in Canada." In any event, a commission possessing all the powers suggested by you could not be constituted without legislation, and it could not, therefore, be appointed or get to work until next year, by which time, it is understood, the Dominions Royal Commission will be visiting Canada.

"While, however, it is feared that the appointment of a special commission of the nature proposed is not possible, His Majesty's Government would be prepared, if desired, to communicate with the Dominions Trade Commission (of which the Canadian Minister of Trade is a member), informing them of the desire of the Canadian Government that the subject of shipping freights, etc., in the trade between Canada and the United Kingdom should be investigated with as little delay as possible. The Board of Trade hope that, in the circumstances, this course will meet the wishes of the Canadian Government."

Might I be permitted to say that, if the Dominions Trade Commission could take this matter up and make an interim report on it, if necessary, I do not think the enquiry could be in better hands. On receiving this advice, I attended on the Chairman of the Dominions Trade Commission, Sir Edgar Vincent, who told me that the question of transportation within the Empire was one which his commission had already taken some evidence on; and that, under the present arrangement, the commission would be in Canada next August. He also thought that, if necessary, a sitting of the commission could be arranged at an earlier date, in London, to take evidence. Notwithstanding the information which I received from the conference lines, I am still of the view that an investigation should be held.

For the Western movement, the lines forming part of the conference which are, the Allan, the Canadian Northern, the Canadian Pacific, the Cunard, the Dominion, the Donaldson, the Furness, the Manchester Liners, and the Thompson Lines, issue a tariff for the different seasons, it being drawn to include general minimum rates on practically all, or at least on the chief commodities moving. These minimum rates so called are practically the maximum rates that the lines obtain, and the shipper is in a position to know, as in my view he always should know, what the rate will be on a given commodity within a given period. No such rates are issued in so far as the eastern movement is concerned; but weekly lists are issued from time to time so that it may be entirely impossible for the Canadian shipper to know what his rates on flour or wheat may be in a month's time. I have been unable to at all convince the conference that this is an improper practice in so far as the eastern movement is concerned. The advanced reason why the admitted convenience can be given to the shipper shipping west is that there is never a scarcity of room on the western movement, while there may be a scarcity of space on the eastern movement. The position of the companies shortly is, that with the higher amount of business offering, and the possibility of shortage in boat accommodation, they should be allowed to take advantage of the shortage and charge a greater rate for handling the large than would be charged for handling the smaller amount. This practice the companies claim to be necessary. Whether it is necessary or not, it is certainly injurious to Canadian exporters, and is entirely against the usual basis of rate adjustments, at least so far as a land haul is concerned. It should be noted that, while it is true boats rarely, if ever, get a full cargo going west; during the present season the eastern rates have been so remunerative that a largely increased number of tramp boats have gone to Montreal not carrying English merchandise at all, but simply to get the return eastern cargo.

The effect of the present situation is that when the exporter of this country is not afforded sufficient facilities by the ocean carrier, the exporter is penalized for that situation. The Canadian exporter, by reason of the fact that, speaking in a general sense, nearly all the country's exports have a low value in proportion to the space occupied, and a comparatively low value in relation to the cost of transportation, is peculiarly affected by any increases in the cost of transportation, so that it becomes a matter of prime importance to keep such costs to a reasonable rate. While on some commodities the increased rate may be felt on the western movement, this is not the result speaking generally. So far as the western movement is concerned, apparently, the exporters are more concerned with the speed and regularity of service on many articles than they are in the rate; those that I now refer to being articles the value of which is large compared to the cost of transportation. This is evidenced by the fact that, in the arrangement that the conference has made, the Manchester Liners are allowed to absorb certain charges, with the result that, on shipment of goods originating in Manchester, the comparative cost works out as follows:—When shipping at Manchester, cartage from the warehouse to the Manchester docks, 2s. per ton; ship canal toll, 4s. 4d.; total, 6s. 4d. per ton. When shipping at Liverpool, cartage to the railway station, 1s. 6d.; railway rate from Manchester to Liverpool, 7s. 1d.; cartage to docks, 1s. 6d.; Liverpool dock and town dues, 1s. 10d.; total, 11s. 11d. per ton. These illustrative figures show a movement (prior) on the printed lists which were published previous to the recent advance in railway rates and ship canal tolls. English railway rates have been increased 4%; ship canal tolls, 16%; and Liverpool dock and town dues, 10%. These increases do not affect, however, the proposition that it is considerably cheaper to ship at Manchester than at Liverpool. Notwithstanding this, a very large proportion of goods, originating not only in the Midlands but in Manchester itself, are shipped at Liverpool. The ship canal tolls shown in the above statement, I am advised, are now absorbed by the Manchester Liners; so that the saving, shipping by Manchester as against Liverpool would, on the information with which I have been supplied, amount to 9s. 11d. per ton. The claim that importers made to the effect that the British preference was absorbed by the increased rates does not appear to be borne out. The following statement, prescribed by the conference lines, would seem to be approximately correct:—

	Value.
Woollen Goods	£90 p. 40 c. ft.
Cotton Piece Goods	£80 p. 40 c. ft.
Carpets	£50 p. 40 c. ft.
Felt Hats	£30 p. 40 c. ft.
Cutlery	£150 p. 40 c. ft.

No shipper has supplied me with any information which supports the general proposition, that is, that the British preference has been absorbed. I have no doubt, however, that on articles sold on the Canadian market by the British exporter, in close competition with exporters in other countries, the increases in rates of recent years have a detrimental and injurious effect on the traffic, and may account in part for the fall in ratio of British exports. The demand for investigation made by the Canadian Government, and acceded to as above noted by the Imperial authorities, is, therefore, justified by the exigencies of the traffic moving in either direction.

The position, when action was taken by your honorable body, was that steamship conferences were effective so that no competition was afforded beyond the sporadic competition that the tramp freight boat affords. Competition of this character affords no protection whatever to shippers requiring regular shipment in less than cargo lots. In my view, such a condition practically eliminates all competition, and requires some governmental control. This state of affairs obtained at the time of my interview with the steamship representatives in England. Since my return, I notice that the C.P.R. Co. states that it has withdrawn from the conference. I am unaware as to whether this action is dictated by a change of policy on the part of that company, or whether it is the natural outgrowth of the conflict existing between the C.P.R. and the German lines, which are in another conference. However this may be, I think the present opportunity for investigation in conjunction with the Imperial authorities is of too much value to abandon for this cause.

I should also inform you that I am advised by the steamship conference that the so called loyalty provision, under which a charge of 10% was made for primage, and which is shown on the official tariffs of the conference, being General Minimum Tariff 11, effective Jan. 1, 1913, and by General Minimum Tariff 11A for the summer season of 1913, has been withdrawn. Under the former practice, this charge of 10% was rebated in six month periods to all shippers who shipped no freight except by conference lines, and has been the subject of much unfavorable comment.

The matter of governmental control is difficult. Certain conditions which apply to railways do not apply to ocean carriers. The carrying unit is a fixed unit. For this reason the sections of the Railway Act which prevent discrimination cannot well be applied. It would be against the interests, not only of the carriers, but, in the long run, of the commerce of the country, if a boat, being unable by reason of the state of the market to obtain a proper cargo at regular rates, could not be loaded with goods which would only move by reason of the special inducement that a cut at the last hour, having reference to that particular sailing, might afford, on the other hand, as at present advised, there would seem to be no reason why standard maximum rates should not be fixed by an independent authority, and that no increase should be allowed in standard maximum rates except with the consent of that authority.

In fixing maximum rates, regard, of course, would be had to, not only the fair rate on any given commodity, but what a fair proportion as between commodity and commodity would be. For example, one of the most serious complaints against steamship practices is made by the millers, who complain that a spread as between wheat and flour, which existed from 1907 to 1912, inclusive, varying from 1.52 cents for the year to 3.85 per 100 lbs. was increased in the early part of this year to 7 cents, resulting, as the flour exporter submitted, in a very unfair preference to the British miller; or, putting it conversely, in improperly penalizing the exporter of flour from this country. There is no doubt that the increase in the spread would militate much to the disadvantage of the Canadian shipper. At the same time, it must also be borne in mind that the milling capacity of Great Britain is constantly increasing. The milling unit is much larger, more economical and of greater efficiency, with the result that, so far as the metropolitan district of London is concerned, the local milling capacity since 1903 has increased from 430 sacks an hour to 850, so that the present milling capacity is well over five million sacks per annum. Large increases have also been noted at both Liverpool and Manchester. This increase in milling capacity is relied on by the carriers as accounting for any difficulty that Canadian exporters of flour may be at rather than increased ocean rates or the variable spread.

	Rates.		
Preferential.	1910.	1912.	Increase.
5% — 90s. p. 40 c. ft.	27s. 6d.	30s.	2s. 6d.
5% — 80s. p. 40 c. ft.	22s. 6d.	30s.	7s. 6d.
5% — 50s. p. 40 c. ft.	20s.	25s.	5s.
7½% — 45s. p 40 c. ft.	15s.	20s.	5s.
7½% —225s. p. 40 c. ft.	25s.	35s.	10s.

I am not covering in this report the question of the individual advances, not attempting to deal with their justification, as no useful result can be arrived at without a proper investigation and full production of papers. I should, however, draw to your attention that, in addition to what I have already said, the position of the liners is that all control of any kind is impossible to work out, and would be a great detriment to the shipping industry; and that the increased rates are justified not only by the increased cost of service already noted, but by the peculiar conditions of the Canadian trade. They point out that very little high rated package freight is shipped from Canada, and very little specie, ivory, silk, copper, and other high rated commodities are shipped to Canada; that many one time revenue producing commodities have either disappeared or are shipped in diminishing quantities owing to increased domestic consumption, e.g., butter and cheese; competition of domestic manufacturers, e.g., cotton goods and metals; domestic and U.S. mar-

ket conditions, e.g., grain; reduced quantities of general cargo leave westbound fine goods and eastbound grain, flour and lumber—the only goods moving in considerable quantities on which revenue can be secured. In order that the position of the confederated lines may be fairly placed before you, I attach hereto a copy of an open letter to the Times from W. Black Noble, who attended the unofficial conference I had with the representatives of the liners at Liverpool. I should call attention to this paragraph of his letter:—

"Again, with a very few exceptions, steamship rates are regulated by the law of supply and demand; that is to say, should a line, or number of lines in conference together, agree on a rate altogether out of proportion to the value of the goods, it would be impossible for any traffic to move, and automatically the rate in question would cease to exist for all practical purposes. The result would be that a fresh rate, which would give a just and proper share of the profits of the transaction to both parties interested, would come eventually into existence."

While not agreeing with some of Mr. Noble's conclusions, this seems to me to be a frank and fair statement of the present position. Confederated lines (as the lines then were) can, as Mr. Noble states, make a rate altogether out of proportion to the value of the goods, and as a result, extingnish the traffic; and as a further corollary, as pointed out by Mr. Noble, eventually a fresh rate which would give a just and proper share to the profits of the transaction (as interpreted by the carrier) to both parties interested would eventually come into existence. This affirmation by a member of the conference of a condition under which the business of any given importer could, at any time, perhaps by the carrier's whim, lack of information, or desire for an excessive return, be at least temporarily extinguished, would appear of itself to call for the fullest investigation.

I desire to express my obligation to the Department of Trade and Commerce and the Montreal Harbor Commission for valuable information from time to time supplied.

In connection with the foregoing we are officially advised that the Dominion Government has requested the British Government to have the matter referred to the Dominions Royal Commission, of which the Hon. G. E. Foster is a member. Evidence will be taken in Great Britain and also in Canada, which the Commission is to visit this year.

Magnetic Chart, Etc., for Hudson Bay.

An Ottawa press dispatch says:—"As an aid to the navigators of Hudson Bay and Straits who find their compasses seriously affected by proximity to the magnetic pole, the Department of Naval Service will at an early date publish the result of investigations which have been carried on for some time past. A magnetic chart will also be published giving carefully worked out tables of the deviations to which the compass is subject at various points in the bay. The nearness of the magnetic pole causes the compass to play strange antics, which are to say the least discouraging to navigators, especially in foggy or stormy weather when everything depends on the compass for guidance. In one part of the bay the needle is actually dead and swings free. In other cases it causes the navigator to travel landward if its motions are followed. All these deviations have been carefully worked out, and it is believed that a knowledge of these made possible by the possession of the chart will almost entirely obviate the present difficulties under which the navigators labor."

The Dominion Government has awarded the contract for the construction of section 5 of the Welland Ship Canal to the Canadian Dredging Co., Midland, Ont.

Investigation Into the Stranding of the Steamship Turret Chief.

An investigation into the stranding of the Canadian Lake and Ocean Navigation Co's. s.s. Turret Chief in Lake Superior, near Copper Harbor, Keweenaw Point, U.S., on Nov. 8, was held at Kingston, Ont., Nov. 21, by Commander H. St. G. Lindsay, R.D. R.N. R., Dominion Wreck Commissioner, assisted by Captains F. Nash and W. S. Batten, as nautical assessors. The following judgment has since been delivered:

The Turret Chief was on a voyage from Midland to Fort William, Ont., in water ballast, and left the Sault Ste. Marie Canal on Nov. 7 at about 6.30 a.m., with a crew of 17 all told, and drawing about 11 ft. aft and 6 ft. forward, the propeller being only half immersed. Proceeding out into Lake Superior the patent log was set off Iroquois Point at about 7.45 a.m. Whitefish Point was abeam at about 10 a.m., when a course was set, n. w. by n., by compass, for Passage Island. Everything seems to have gone well until about 9 p.m., when the wind, which had been southwesterly all day, shifted suddenly to the northward, and commenced to blow hard. At 9.30 the vessel fell off into the trough of the sea, apparently not being able to hold up against the wind and sea, and apparently remained in that position until she drove ashore at 4 a.m. on the 8th. No attempt was made by the crew to leave the ship on striking, as she had driven almost broadside on to the shore, and was soon driven up by the seas within a few feet of the land, where she lay, and there was apparently no immediate danger anticipated of the vessel breaking up, as only spray was coming over the superstructure. At 10 a.m., the master considered it unsafe to remain any longer on board, as the ice was forming fast on the weather (starboard) side of the ship, and likely to list her to seaward, so all hands left her by means of a ladder from the fore part of the ship to the shore. The vessel is still on the rocks, with very little water in her holds, showing that her shell plating cannot be badly damaged.

The court, after carefully reviewing the evidence adduced, is unanimous in its opinion that the stranding was caused by the vessel not being able to head up to the sea, owing to her light draught, and the propeller having no hold of the water, and also to her peculiar construction exposing a very high side to the wind, which, being strong on the beam, would tend to drive her to leeward very fast. The court is also of opinion that the master, Thos. Padington, did not do all that might have been don to try to save his shin, inasmuch as he did not appear to have made proper allowance for the large amount of leeway the ship was making, and therefore lost the run of the vessel's position, and apparently he did not try and find out what speed she was making through the water after the patent log was lost during the night, and the court is satisfied that had he put his ship on the other tack, and headed her to the eastward, he might have had some chance of keeping her afloat, knowing as he should have done that the land.—Keweenaw Point—was to leeward and only about 30 miles off, when the wind came out from northwest at 9.30 p.m. The court therefore severely censures him for this error of judgment, and total ignorance of, or disregard to the most essential part of the duties of a master, viz: a knowledge of the position of his vessel at all times.

The court criticizes the fact of this valuable vessel leaving port so light that her propeller was only half immersed, and short handed in the stokehold, especially at this season of the year. It was no doubt due to this that the vessel was not able to head up to the sea. The court would suggest that either a deep sea lead and line, or a patent sounding machine would be very useful to vessels in circumstances like this in the inland waters, especially in Lake Superior, where soundings are of more than ordinary depth, and also that an officially fixed light load line for all vessels would be a great protection to lives and property engaged in navigation on the Great Lakes.

The Organization of Canada Steamship Lines, Limited.

As stated in Canadian Railway and Marine World for November the company which has been formed to absorb the Richelieu and Ontario Navigation Co. and other navigation companies acquired in that connection will be called Canada Steamship Lines, Ltd., the name originally chosen, Canada Transportation Lines, Ltd., not having found favor with the interested persons in Great Britain. The directors and London advisory committee are, as stated in our last issue. It will be noticed that Jas. Playfair, H. W. Richardson, F. A. McGee, W. Hanson, W. G. Morden and C. G. Boyne, who are on the R. and O. N. Co's. board, are not on the new board.

The company has been incorporated under the Dominion Companies Act, with an authorized capital of $25,000,000 divided into 125,000 7% preference shares and 125,000 ordinary shares, of the par value of $100. The company, as stated in our last issue, is offering £1,254,720 16s. 5d. or $6,106,308.51 of 5% consolidated debenture stock, part of a total amount of £1,849,317 12s. 10d., or $9,000,000, repayable Aug. 15, 1943 at 105%. This stock is constituted by a trust deed and is secured by the company's lands, buildings and steamships and shares of other companies acquired or to be acquired, and by a general charge upon the undertaking. An accumulative sinking fund of 1½% per year is to be started in 1915. A portion of the consolidated debenture stock has been underwritten in Canada.

The company has been formed to acquire (1) The property of the Richelieu and Ontario Navigation Co., Ltd., which holds the whole of the shares of the following companies: Inland Lines, Ltd., Northern Navigation Co., Ltd., Niagara Navigation Co., Ltd., St. Lawrence River Steamboat Co., Ltd., Richelieu & Ontario Navigation Co. of U. S. A., Thousand Islands Steamboat Co., Ltd., and the steamships C. A. Jaques and Bickerdike, formerly constituting the Merchants Montreal line. (2) The Ontario and Quebec Navigation Co., Ltd. (3) The steamship Haddington. (4) Not less than 80% of the shares of the Canada Interlake Line, Ltd., and the Quebec Steamship Co., Ltd., and to carry on the business of the several companies as a single undertaking under one central management. This will give the company more than 100 vessels controlling the most important part of the passenger and freight transportation between Canadian ports on the Great Lakes and Montreal and Quebec, while the Quebec Steamship Co. runs lines from Quebec to ports on the Lower St. Lawrence and to New York, and from New York to the Bermudas and West Indies.

The transfer of the R. and O. N. Co's. assets to the Canada Steamship Lines, Ltd., was completed at a board meeting of the former company, at Montreal, Dec. 12. The R. & O. N. shareholders receive $12,000,000 7% preferred stock and $4,000,000 common stock.

James Carruthers, President, is reported to have stated recently, that the London interests in charge of the financing of the company have come to the conclusion that the present is not an opportune time to

make any public issue, and the debenture stock has therefore been taken up by a syndicate composed of some of the most powerful financial houses in England, and by well known persons in Canada. On these subscriptions, 20% had then been paid up, and 30% was to be paid on Dec. 14, the balance being payable in two instalments, on Mar. 1 and May 1. The syndicate intends making a public offering of the debenture stock as soon as financial conditions are considered more favorable.

The combined net earnings of the different companies now owned by the new company, were, to Nov. 1, 1913, over $1,450,000, and the officials report that the total net earnings for the year, notwithstanding adverse circumstances, will approximate $1,700,000. An exact statement of the earnings will be published as soon as the returns are in after the close of navigation. The balance sheet shows that there are physical assets, valued by the Canadian Appraisal Co., at over three times the amount of the debenture stock, and the net earnings, without any of the advantage of the benefits of the consolidation, show as over three times the amount of the bonds, and sufficient to meet the fixed charges, the 7% dividend on the preference stock and a small dividend on the ordinary shares, which last, however, it is not the intention to pay for the present. With the savings that can be effected by the consolidation, the net earnings should approximate $2,000,000 a year on the basis of the business that the different companies have done in the past year.

The interests in control of the R. & O. N. Co. have felt for some time that in view of the immense and rapid growth of the country and the consequent necessity for continuous additions and improvements to the property, in order to provide a service that would be at all satisfactory, a consolidation of this kind was necessary, if they hoped to secure the capital required, and further feel that in bringing together a fleet that will take care of and profit by both the bulk and package freight and the passenger business of such a large territory, they are putting the company on an absolutely sound basis, and that they can promise a better and more efficient public service.

The following is a consolidated statement showing the assets and liabilities of the various merged companies at Dec. 31, 1912, as prepared by the chartered accountants employed to examine the books:—

ASSETS.

Investments, stores, supplies, etc.		1,167,856
Cash in banks and on hand		500,000
Balances, representing leases, contracts and goodwill, covered by common stock		8,589,647
Vessels (excluding Noronic)		$16,866,834
Real estate, buildings and dock properties		5,450,268
		*$22,317,102
Sundry merchandise		$ 150,000
Paid on Noronic in course of construction		280,079
		$33,004,684

LIABILITIES.

Accounts payable		$ 555,538
Capital—7% preferred	$12,500,000	
Common, issued	12,000,000	
		24,500,000
5% debentures to be issued		6,106,308
Underlying bonds and loans		1,842,838
		$33,004,684

*For the purpose of valuation of the assets as security for debenture stock, the figure is reduced by the Canadian Appraisal Co. to $19,250,406.

Note.—$534,983 of the $9,000,000 debenture stock will remain in the hands of the company for future issues, and in the meantime will be available for financing purposes.

A fleet of fifteen 1000 ton barges, each equipped with twin screw propellers driven by producer gas engines, is now under construction by the Alabama and New Orleans Transportation Co. to operate between the coal fields of Alabama and the City of New Orleans, La.

Atlantic and Pacific Ocean Marine.

The Cairn Line s.s. Cervona was reported wrecked and a total loss near Bear Cove Point, Renews Head, Nfld., Dec. 12.

The steamship which is under construction at Belfast, Ireland, for the White Star-Dominion Line's Canadian service, is to be named Regina.

The C.P.R. s.s. Ruthenia, which arrived at Montreal Nov. 25, was the last ocean vessel from a foreign port for the St. Lawrence navigation season of 1913.

The Osaka Shosen Kaisha is reported to have decided to build two or three 16,000 ton steamships at Kobe and Nagasaki, Japan, chiefly for freight service between Japan and Vancouver, in connection with the Great Northern Ry.

M. J. Haney, director, Canada Steamship Lines, Ltd., was visiting Bermuda early in December, in connection, it is reported, with a possible extension of the company's service, acquired with the Quebec Steamship Co., in the West Indies.

The vessel which the Union Steamship Co. of New Zealand is having built in Great Britain for its Canadian mail service is to be a sister vessel to the recently built Niagara, and it is stated will be named Ottawa.

The Allan Line s.s. Alsatian underwent her trials in the Clyde, Dec. 16, obtaining a speed of 20½ knots an hour over the measured mile. She will arrive at Halifax on her maiden trip about the middle of January and sail again on Jan. 31.

The Union Steamship Co. of New Zealand, which operates between Australasia and Canada under a mail subsidy contract, is reported to have ordered an additional steamship in Scotland, of approximately 16,000 tons, for a service between Australasia and U. S. Pacific ports.

The steamships which are under construction in Great Britain, for the C.P.R. Atlantic steamship service, some details of which were given in our last issue, have been tentatively named Metagama and Missanabie, but it has not been decided that these names will be given them when launched.

The Norwegian steamship Imperial Transport, bound from Norway to Philadelphia, put in at Louisburg, N.S., Dec. 15, 26 days out, with her fore plates badly strained on account of heavy head seas. Temporary repairs, consisting of timbers and concrete, were made to enable her to complete her voyage.

Vancouver press reports state that the Merchants and Shippers Steamship Co., at present operating between England and South American ports, will establish a steamship service between Australia and Vancouver, during this year, working in conjunction with either the Canadian Northern Ry., or the Great Northern Ry.

The Cunard Line is reported to have placed an order for the construction of another steamship, which is to be used solely for the Canadian service, and to be named Aurania. It is said she will be about 520 ft. long, and about 14,000 gross tons, with accommodation for second and third class passengers only. The operation of the company's Canadian service is said to have been exceedingly profitable.

It is reported in Montreal that Furness Withy and Co. will inaugurate a special steamship service from Montreal to Europe next season, in order to cope with the export grain trade. This decision, which the local management states it is not in a position to confirm, is said to be the result of the report of the Chairman of the Montreal Harbor Commission on the shipping of grain from Montreal, which has been dealt with in a previous issue.

The first sailing of the Royal Mail Steam Packet Co's. s.s. Cobequid, under the new agreement for a faster mail steamship service between Canada and the West Indies, took place Dec. 5, from Halifax, N. S. A fortnightly service has been arranged, three other steamships being engaged in the service viz,—Caraquet, Chaleur and Chignecto. Calls will be made at Bermuda, St. Kitts, Antigua, Dominica, St. Lucia, Barbados, Grenada, St. Vincent, Trinidad and Demarara, and St. John, N.B., will be called at on the return voyage.

Canadian Northern Steamships Ltd., has purchased the s.s. Principe di Piedmonte, which has been operating between Genoa and New York in the passenger and freight trade, and has leased her to the Uranium Steamship Co., in place of the s.s. Volturno recently burnt at sea. The name of the

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during November, 1913.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	1,098	4,421	5,519
Grain	"	Bushels	9,243,784	12,423,773	21,667,557
Building stone	"	Short tons	.....	.....	.....
Flour	"	Barrels	463,202	1,126,910	1,590,112
Iron ore	"	Short tons	4,230,030	1,135,483	3,365,513
Pig iron	"	"	.....	3,361	3,361
Lumber	"	M. ft b.m.	7,403	65,662	73,065
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	34,245,702	13,386,830	47,632,532
General merchandise	"	Short tons	496	25,724	26,220
Passengers	"	Number	387	157	544
Coal, hard	Westbound	Short tons	52,077	239,691	291,768
Coal, soft	"	"	338,021	1,007,452	1,345,473
Flour	"	Barrels	.....	.....	.....
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	15,720	36,571	52,291
Iron ore	"	"	.....	.....	.....
Salt	"	Barrels	9,520	104,626	114,146
General merchandise	"	Short tons	80,009	84,447	164,456
Passengers	"	Number	201	16	217
Summary.					
Vessel passages		Number	876	1,510	2,386
Registered tonnage		Net	2,527,162	2,983,111	5,510,273
Freight—Eastbound		Short tons	3,516,819	2,057,316	5,574,135
" —Westbound		"	487,187	1,383,855	1,871,042
Total freight		"	4,004,006	3,441,171	7,445,177

vessel has been changed to Principello. She was built at Sunderland, Eng., in 1907, and is equipped with all the latest devices including wireless telegraphy. Her tonnage is 6,365 gross, 4,044 register. She will be placed on the same route as the Volturno, between European continental ports and New York, calling at Halifax, N.S. The Volturno which was lost was owned by Canadian Northern Steamships, Ltd., and chartered to the Uranium Steamship Co.

With reference to a report that the Hudson's Bay Co. had decided on an expenditure of £4,000,000 for additions to its trading stations and stores throughout northern Canada, and on the construction of a number of vessels for operation from the Pacific coast to Great Britain, by way of the Panama Canal, we are officially advised that the company has no intention of building vessels for the route named. The actual transportation needs of the company recently entailed the building of some additional steamships, and six were decided on; two of these are now in service, one is under construction, and three are under consideration. The new store at Calgary, Alta., was recently opened for business, and it is in this direction that most of the recent development has taken place.

Maritime Provinces and Newfoundland.

The Lurcher Shoal lightship in the Bay of Fundy, which was taken off her station recently for repairs, has been replaced.

The Cape Breton Electric Co.'s s.s. Electronic has arrived at Yarmouth, N.S., where her machinery is being installed, after which she will be added to the ferry service between Sydney and North Sydney.

It is reported that dredging will shortly be commenced in the harbor at Stn Johns, Nfld., where it is stated that the ends of wharves only can now be used by vessels, and that the side dockage for a number of the wharves is absolutely useless owing to a gradual filling up.

The Terra Nova, the ship of Captain Scott's Antarctic expedition, recently left Cardiff, Wales, for St. John's, Nfld., where she is to re-engage in the whaling and sealing industry, in which she was employed until engaged for service in the Antarctic. Her figure head has been presented to the City Council of Cardiff.

The Consumers Fish and Cold Storage Co., Ltd., has been incorported under the Dominion Companies Act, with $50,000 capital and office at Yarmouth, N.S., to carry on a general fish and cold storage business, and in connection therewith to own and operate vessels. W. D. Sweeny, Yarmouth, N.S., is interested, and all the others concerned are resident in Boston, Mass.

Work is in progress on the Courtenay Bay development in St. John harbor, a channel with a depth of 32 ft. at low water is being dredged, and there is under construction a breakwater on the east side of the bay, and a dry dock is under contract with the Dominion Government. The dry dock will be excavated in the point south of the old penitentiary grounds, and the breakwater will run out from the shore immediately east of the dry dock.

The Dominion Department of Marine will receive tenders, Jan. 7, for the purchase of the Government patrol boats Hudson, now at Port Elgin, N.B.; Davies and Number One, now at Pictou, N.S., and Number Two, at Harbor de Lute, Campobello, N.B. They are to be sold as they stand without equipment. The Hudson was built at St. John, N.B. in 1903, and is screw driven by engine of 7 n.h.p., and has dimensions, length 57.7 ft., breadth 12.5 ft., depth 4.7 ft.; tonnage, 34 gross, 23 register.

The marine warehouse freight checkers at St. John, N.B., have applied for the appointment of a conciliation board to investigate the terms of employment and wages, and have named J. E. Moore, a freight checker at the wharves, and president of their union, to represent them on the board. The Shipping Federation of Canada has protested against the appointment of a board on the present application as it does not comply with the regulations of the Industrial Disputes Investigation Act, and that a number of the checkers have struck work illegally.

Province of Quebec Marine.

The Richelieu and Ontario Navigation Co.'s s.s. Murray Bay has been drydocked at Montreal for general overhaul.

It is announced that the projected extensions of the Alexandra, King Edward and Jacques Cartier piers at Montreal will not be commenced until next season, or pending the completion of the Dominion Government's proposed alterations at the entrance to the Lachine Canal.

The number of vessels passing through the Lachine Canal during 1913 was 664, of which 442 were Canadian, and 222 U.S. vessels. They represented a combined tonnage of 239,377, and made 10,197 trips. The number of passengers carried was 107,073, and the cargo tonnage, 4,977,559 tons.

It is reported that the Dominion Government has decided to undertake the work of straightening the Lachine Canal between Cote St. Paul bridge and lok 4, during the winter. The curve is 250 ft. long, and on its removal, a wharf about 1,000 ft. long will be built, with a power house on the west side of the curve near the present lock 4, for the operation of the canal gates.

Ontario and the Great Lakes.

The Department of Public Works has received tenders for the renewal of the south pier in Burlington channel, Hamilton.

The C.P.R. steamships Alberta and Athabasca will be docked at Port Arthur during the winter for general overhaul and repairs, at an estimated cost of $70,000.

The dredging of a channel in the Mission River, at Fort William, has been completed. There is now a channel 600 ft. wide, 25 ft. deep, and over 1,400 ft. long, available for navigation.

The United States s.s Edward Buckley, which was lying aground at Harbor Beach, Lake Huron, for some weeks, has been released and taken to Sarnia, where she will be examined for bottom damage and repaired.

The results of the hydrographic survey conducted during 1913 by the Dominion Government are reported to indicate that first class harbor facilities exist in the vicinity of the mouth of the Nottaway River, on James Bay.

The Northern Navigation Co. will, in January, move its auditing and accounting offices from Collingwood to Sarnia, where the head office has been located for some time. An office will be maintained at Collingwood, in charge of an agent.

The ratepayers of Sault Ste. Marie recently voted in favor of subsidizing the Lake Superior Drydock and Shipbuilding Co.'s project for the construction of a drydock and shipbuilding plant there, to the extent of $20,000 a year for 20 years.

The St. Lawrence and Chicago Steam Navigation Co. has declared a dividend of 8% for the past year, which would probably have been larger but for the loss of the s.s. James Carruthers, on which the company carried part of the insurance.

The steamboat Cornwall has been bought from the Calvin Co., Kingston, Ont., by the Donnelly Wrecking Co. She was built at Kingston in 1874, and was formerly named Algerian, and owned by the Richelieu and Ontario Navigation Co. She is paddle wheel, driven by engine of 61 h.p., and her dimensions are, length 176.6 ft., breadth 27.1 ft., depth 9.9 ft.; tonnage, 588 gross, 304 register.

The Northern Navigation Co.'s s.s. Huronic, which grounded at Whitefish Point during the storm of Nov. 9, will be drydocked at Port Huron during the winter, when she will be thoroughly examined for any possible damage she may have sustained. It is stated that bilge keels will be placed on her in order to prevent her rolling in heavy weather, and that she will receive several other improvements.

The wireless telegraph stations which the Dominion Government is erecting at Toronto and Port Burwell are reported to be complete, and it is anticipated that they will be in operation from the commencement of the year, when communication will be maintained with the car ferry steamboats plying across Lakes Ontario and Erie. The station at Kingston will, it is reported, be ready for operation by the spring.

The Hamilton Harbor Commissioners have decided to build a warehouse, with the necessary appliances for the carrying on of harbor and transportation business. The building will be on the westerly end of the revetment wall recently built by the Dominion Government in Burlington Bay, near the foot of Catharine St., and which has been transferred to the Harbor Commissioners. A. W. Peene is acting Engineer for the Commissioners.

The Great Lakes Towing Co. has been awarded contracts for the release of the steamships Turret Chief and L. C. Waldo, wrecked in the recent storm on the Great Lakes. The Turret Chief is ashore on Keeweenaw Point, six miles from Copper Harbor, and the L. C. Waldo is on Gull Rock, Lake Superior. The payment is on the basis of $15,000 for the former vessel and $20,000 for the latter. In both cases, the vessels have to be delivered at designated ports.

It is reported that the Great Lakes Protective Association has called upon its members for an assessment of 50% of the original contribution, which was settled at 4% of the insurance valuation. The Association carries 25% of the insurance on its members vessels. This action it is stated has been taken after a careful examination of the losses sustained through the storm of Nov. 9, which made the original amounts paid insufficient to meet all the claims for the season's losses.

In view of the accidents which have happened of late on the Great Lakes, where vessels have sunk and their whereabouts have not been ascertained, a Port Arthur mariner has suggested that each vessel should have attached to its topmast, by a coil of rope, a floating buoy, so that in the event of the vessel going down, its location would be marked. It is claimed that the device would be quite feasible, and surprise has been expressed that on account of its simplicity it has not been carried out before.

The U.S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for November, as follows:—Superior,

602.91; Michigan and Huron, 580.44; Erie, 572.28; Ontario, 246.06. Compared with the average November levels for the past 10 years, Superior was 0.60 ft. above; Michigan and Huron, 0.06 ft. above; Erie, 0.46 ft. above, and Ontario, 0.39 ft .above. It was anticipated that during December, Superior, Michigan, Huron and Ontario would fall about 0.2 ft., and Erie about 0.1 ft.

Hamilton merchants and vessel owners are protesting against the harbor rates charged by the local harbor commissioners, and approved by the Governor in Council. The Chairman of the Commission is reported to have stated that the rate was fixed in order to provide a sufficient revenue for the government of the harbor, and though he favored a free harbor, it could not be done unless the city made a sufficient annual appropriation for the pur pose, which it did not seem likely would b' done.

A press report from Ottawa, Dec. 15, stated that it had practically been decided to have a thorough investigation by the Parliamentary Marine and Fisheries Committee, into the recent Great Lakes disaster, and that evidence would be called from among the persons and organizations interested, with a view to increasing the safeguards for passengers and sailors. It is anticipated that legislation will later be effected fixing a load line and providing for the inspection of vessels before they leave harbor.

A large bulk freight steamship, reported to be the largest of the kind in the world, is under construction at Port Arthur, and which, it is anticipated, will be ready for operation towards the latter part of next season. Her dimensions are:—length over all 625 ft., length on keel 604 ft., moulded beam 59 ft., moulded depth 32 ft. She will have a carrying capacity of over 9,000 gross tons. She has been designed to handle bulk cargoes of coal, ore and grain. The hull is on the Isherwood system, and is of steel, with double bottom and side tanks 5½ ft. deep, up to the main deck stringer.

The Pelee and Lake Erie Navigation Co.'s s.s. Pelee was launched at Collingwood, Dec. 20. She will be utilized for passenger and freight business between Pelee Island and the main land. The general dimensions are,—length 146 ft., beam 24 ft., depth 18¼ ft. to promenade deck. The propelling machinery consists of triple expansion engines of the jet condensing type supplied with steam by one Scotch marine type boiler, designed for a speed of 13 knots an hour under full lead. She will be completed for operation on the reopening of navigation.

Following on the effects of the storm on Lake Huron, Nov. 9, during which a number of vessels were wrecked and lives lost, an inquest was held at Goderich into the death of one of the crew of the s.s. John A. McGean, whose body was washed ashore there. The verdict, which was delivered Dec. 14, merely stated that death was due to drowning owing to the wreck, but, in addition, the jury made a number of recommendations covering, chiefly, that Goderich should be properly and completely equipped as a harbor of refuge, and the more extensive use of wireless telegraphy, both on land and on the various vessels travelling the lakes.

The Lake Superior Dry Dock and Construction Co., the incorporation of which was announced in a recent issue, has a capital stock of $1,500,000, divided into $500,000 7% preference stock, and $1,000,000 common stock. The City of Sault Ste. Marie, Ont., has granted a bonus of $20,000 a year for 20 years, and has also granted a site for the erection of the plant. Arrangements are in course of progress for the granting of a subsidy by the Dominion Government of 3% per annum for 20 years on an approximate expenditure of $1,338,000. It is reported that the contract will shortly be awarded to the British Construction Co., London, Eng., for the construction of the plant, plans for which have been approved by the Dominion Government, and that bonds for $1,200,000 are to be issued.

The s.s Noronic, which has been built at Port Arthur for the Northern Navigation Co., is at Sarnia, where she will have her fittings and furniture installed during the winter. She is built on the Isherwood system with watertight compartments, and has five steel decks, main, spar, promenade, observation and boat. Her dimensions are:—length over all 385 ft., length between perpendiculars 362 ft., beam, moulded, 82 ft., depth, moulded, 28¾ ft. The propelling machinery consists of four cylinder, triple expansion engines, with cylinders 29½, 47½, 58 and 58 ins. diar., by 42 ins. stroke, suplied with steam at 200 lbs. working pressure by four 15½ by 11 ft., and one 12½ by 11 ft. Scotch boilers, under forced draught.

Vessels for Hudson Bay Service.—It is reported that tenders are being invited in Great Britain, for the construction of two steamships, to be named Nelson and Nottaway, for operation between Port Nelson on Hudson Bay, and Nottaway on James Bay, in connection with the North Ry., which is projected between Nottaway and Montreal, that they will be 14 knot vessels, making the trip between the two ports in 48 hours, that their dimensions will be,—length 365 ft., beam 49 ft., draught, about 20 ft., with a carrying capacity of 4,500 tons, or 150,000 bush. of wheat, that there will be passenger accommodation for 100 first class and 200 second, and that they are required for service by May 1915.

Thousand Foot Dry Dock.—If New York is not to be at a serious disadvantage, as compared with the ports at Quebec and Boston, it must provide its own dry dock for the accommodation of the largest ocean liners. At both Quebec and Boston dry docks are being built capable of accommodating ships 1,000 ft. long. The Dock Commission is planning to build a dock of this size at South Brooklyn.

List of Steam Vessels Registered in Canada during November, 1913.

No.	Name	Port of Registry	When and Where Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134145	Byron Whitaker	Montreal	Mount Clemens, Mich.	1890	222 6	37 7	33 8	1539	959	s9n.h.p. sc.	F. E. Hall, Montreal.
133937	Dollard	Ottawa, Ont	Kingston, Ont.	1913	178 6	31 9	15 3	761	323	116 " "	Minister of Marine and Fisheries, Ottawa, Ont.
134071	Eastholm	Vancouver, B.C.	Vancouver, B.C.	1913	93 0	24 3	6 8	197	118	16 " "	Lincoln Steamship Co., Vancouver, B C.
133758	Helena	St. John, N.B.	Collingwood, Ont.	1907	108 8	28 3	14 0	299	204	81 " "	Minister of Public Works, Ottawa, Ont.

List of Sailing Vessels and Barges Registered in Canada during November, 1913.

No.	Name	Port of Registry	Rig	When and Where Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
134146	A. Bibeau	Montreal	Sloop	Pierreville, Que.	1913	107 2	2 2	7 4	131	A. Bibeau, Notre Dame de Pierreville, Que.
134041	Azanetta	Lunenburg, N.S.	Schr.	Bayswater, N.S.	1913	59 0	15 8	9 0	35	B. Cleveland, Bayswater, N.S.
134132	Bic	Quebec, Que.	Yawl	Ile-aux-Grues, Que.	1913	70 7	23 8	6 8	61	C. C. Vezina, Ile-aux-Grues, Que.
134030	G.Q.L No. 2	Victoria, B.C.	Barge	Victoria, B.C.	1911	90 0	30 0	8 0	168	C. P. Wolley and F.-H. Stirling, Victoria, B.C.
134143	H.M.C. No. 1	Montreal	Scow	Goderich, Ont.	1912	97 6	31 2	8 4	215	H. M. Connolly, Montreal.
134144	" No. 2	"	"	" "	1912	97 6	31 2	8 4	263	" " "
134147	" No. 3	"	"	St. John, N.B.	1911	60 6	22 0	6 5	69	" " "
134148	" No. 4	"	"	" "	1911	60 2	21 8	6 5	69	" " "
134149	" No. 5	"	"	" "	1911	35 5	19 0	2 5	35	" " "
134150	" No. 6	"	"	" "	1911	60 4	30 2	4 5	129	" " "
134151	" No. 7	"	"	" "	1911	44 9	16 2	3 0	17	" " "
134152	" No 8	"	"	" "	1911	37 0	14 0	2 5	33	" " "
130982	J. I. 5	New Westminster, B.C.	Barge	Steveston, B.C.	1912	50 0	16 0	3 6	27	Jervis Inlet Canning Co., Vancouver, B.C.
133983	J. I. 6	" " "	"	" "	1912	50 0	16 0	3 6	27	" " " " " "
133984	J I. 7	" " "	"	" "	1912	50 0	16 0	3 6	27	" " " " " "
134191	J. F. Boyd No 4	Sault Ste. Marie, Ont.	Scow	Sault Ste. Marie	1911	73 0	30 0	8 0	175	Boyd & Tweedie, Sault Ste. Marie, Ont.
130349	Joseph P. Johnston	Charlottetown, P.E.I.	Schr.	Essex, Mass.	1889	87 6	23 7	7 7	71	M. H. Bonnell, Murray River, P.E.I.
134043	Lauretta Frances	Lunenburg, N.S.	"	Lunenburg, N.S.	1913	106 8	26 3	10 4	95	W. Spindler, M.O , Lunenburg, N.S.
130779	M. T. No. 1	Sault Ste. Marie, Ont.	Scow			104 0	27 5	7 0	193	M. F. Griffith, M.O., Sault Ste. Marie, Ont.
130780	McLean No. 1	" " "	"	Sault Ste. Marie	1907	90 0	24 0	8 0	179	A. B. McLean, Sault Ste. Marie, Ont.
133759	P. W. D. No. 12	St. John, N.B.	Dredge	St. John, N.B.	1913	110 0	32 0	8 1	435	Minister of Public Works, Ottawa, Ont.
134069	Pacific Coast Cable Co., No. 1	Vancouver, B.C.	Barge	New Westminster	1909	72 4	28 0	7 4	137	Pacific Coast Cable Co., Vancouver, B.C.
133892	Percy B	Parrsboro, N.S.	Schr.	Port Greville, N.S.	1913	128 4	32 9	10 8	281	T. K. Bentley and W. A. Lawson, Port Greville N.S.
134031	Transfer No. 4	Victoria, B.C.	Barge	Esquimalt, B.C.	1913	260 0	42 1	12 6	895	Canadian Pacific Railway Co., Montreal.
103172	Una (a)	Guysboro, N.S.	Schr.	Shelburne, N.S.	1894	77 2	22 2	8 2	82	S. H. Pyle, Boylston, N.S.
134042	Viola May	Lunenburg, N.S.	"	Mahone Bay, N.S.	1913	114 3	26 2	10 2	100	S. Ernst, M.O., Mahone Bay, N.S.

(a) Recovered wreck.

British Columbia and Pacific Coast Marine.

H. B. A. Vogel, of South Vancouver, has been appointed Secretary of the recently constituted North Fraser Harbor Commission, with office, for the present, at Eburne.

The West Vancouver Ferry Board is carrying out some reinforcement work on the wharf at the foot of 14th St., at a cost of about $20,000. The plans were prepared by Cartwright, Matheson and Co., Vancouver.

The Public Works Department has awarded the contract for the removal of approximately 300,000 yds. of sand and silt from the new channel across the Sandheads of the Fraser River, to the Navigation and Dredging Co., Vancouver.

One of the matters to be taken up and decided at a meeting of directors of the White Pass and Yukon Route, in London, Eng., early in the year, is the final arrangement for the establishment of the proposed steamship service between Puget Sound ports and Southeastern Alaska.

At an extraordinary meeting of shareholders of the Boscowitz Steamship Co., at Vancouver, recently, it was agreed that the company be wound up voluntarily, and W. S. Buttar was appointed liquidator. The company's property was sold some time ago, and incorporated with that of the Union Steamship Co.

C. H. Nicholson, Manager, G.T. Pacific Coast Steamship Co., Vancouver, recently stated that the report that the company had placed orders for the building of additional steamships for its service, was unauthorized and incorrect. On the completion of the transcontinental line some addition to the fleet will become necessary, but nothing of the nature of the report has taken place.

Wellington Comox Co., Ltd., has been incorporated under the Dominion Companies Act, with $500,000 capital and office at Toronto, to carry on coal and oil mining business, etc., and in connection therewith to own and operate steam and other vessels, wharves, docks and other shipping facilities. The incorporators are all connected with the Canadian Northern Ry's. Toronto offices.

The Government Fisheries Protection cruiser Malaspina, a description of which was given in our last issue, arrived at Victoria, towards the end of October, from Glasgow, Scotland. She took 75 days on the voyage round Cape Horn. Her sister vessel, named Galiano, has been launched at Dublin, Ireland, where both hulls were built the machinery being installed at Glasgow.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

403. Nov. 21. British Columbia, Vancouver Island, west coast, Barkley Sound, Sechart, whaling steamer not now available for life saving service.

404. Nov. 21. British Columbia, Chatham Sound, Prince Rupert, Pillsbury Point, fog bell established.

405. Nov. 24. Ontario, Lake Huron, Goderich, shoal extending from south pier, temporary buoy, caution.

406. Nov. 24. United States of America Lake Erie, Buffalo harbor approach, Buffalo light vessel missing, light buoy established.

407. Nov. 24. United States of America, Lake Erie, Lorain harbor, east breakwater lights destroyed, provisional lights.

408. Nov. 24. United States of America, Lake Huron, southern end, wreck, gas buoy to be established.

409. Nov. 25. Nova Scotia, Bay of Fundy, Lurcher Shoal, lightship replaced on her station.

410. Nov. 25. New Brunswick, east coast, Northumberland Strait, Shediac Bay, Pointe du Chene, Shediac harbor range lights improved.

411. Nov. 25. Quebec, River St Lawrence, Quebec harbor, off mouth of St. Charles River, conical buoy replaced by gas buoy.

412. Nov. 25. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, temporary day marks at lighthouses.

413. Nov. 27. Quebec, River St. Lawrence, above Quebec, Pointe a Basile, range lights to be improved.

414. Nov. 27. Quebec, River St. Lawrence above Quebec, Pointe aux Trembles en bas, light to be improved and arc of visibility increased.

415. Nov. 27. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Grondines Point front range lighthouse, lantern removed, height of light diminished.

416. Dec. 1. Nova Scotia, Cape Breton Island, Bras d'Or Lake, Denys River south basin, buoys established.

417. Dec. 1. Prince Edward Island, north coast, New London harbor, entrance to French River.

418. Dec. 1. Quebec, Gulf of St. Lawrence, Seven Islands Bay, Seven Islands Wharf light established.

419. Dec. 3. Quebec, River St. Lawrence, Lake St. Louis, Lachine front range lighthouse, new foundation.

420. Dec. 3. Ontario, River St. Lawrence, Prescott, Dominion Lighthouse Depot, light for experimental purposes, caution.

421. Dec. 3. Ontario, Georgian Bay, approach to Midland, westward of Gin Rocks, buoy withdrawn.

422. Dec. 3. New Brunswick, south coast, Bay of Fundy, St. John harbor, Courtenay Bay, channel, breakwater and dry dock, temporary lights.

423. Dec. 3. Nova Scotia, south coast, Blind Bay, Kieley Cove, buoys established.

424. Dec. 3. Newfoundland, south coast, Placentia Bay, Placentia harbor, range lights established.

425. Dec. 3. Newfoundland, south coast, Fortune Bay, Sagona Island, fog alarm established.

426. Dec. 3. England, southwest coast, Seven Stones light vessel, submarine fog signal established.

427. Dec. 3. Wales, west coast, Carnarvon Bay light vessel, submarine fog signal established.

428. Dec. 12. Nova Scotia, south coast, Whitehead Island, fog alarm established.

429 Dec. 12. Prince Edward Island, east coast, Cardigan Bay, Panmure Shoal, Wheeler Bar can buoy replaced for winter by a spar buoy.

430. Dec. 15. British Columbia, Vancouver Island, southeast coast, Victoria harbor, Middle Rock, beacon light replaced by temporary light buoy.

431. Dec. 15. British Columbia, Vancouver Island, Saanich Inlet, Finlayson Arm, Beacon Rock, day beacon erected.

432. Dec. 15. British Columbia, Lama Passage, Hunter Island, Serpent Point, day beacon erected; Denny Island, day beacon discontinued.

433. Dec. 17. Nova Scotia, south coast, Halifax approach, Chebucto Head, permanent light in operation.

434. Dec. 17. Quebec, River St. Lawrence, Portneuf en bas lighthouse, additional slats placed on skeleton frame.

435. Dec. 18. Quebec, Chaleur Bay, Paspebiac Point, intended change in character of light.

436. Dec. 18. Quebec, Gulf of St. Lawrence, Gaspe coast, Cape d'Espoir, intended change in character of light.

437. Dec. 18. Quebec, Gulf of St. Lawrence, Anticosti, southwest point, intended change in character of light.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Deerfield, Man., Cereal and Chinook, Alta., and has closed its office at South Moose Jaw, Sask.

The Canadian Northern Ex. Co. has closed its offices at Vista, Man., and Cardiff, Alta., and has opened offices at Salines, Ont., and Highland, Alta.

E. S. Cushing, heretofore cashier, American Ex. Co., Springfield, Mass., has been appointed cashier American and National Ex. Cos., Montreal.

T. McNeill, Agent, C. P. R., Liverpool, Eng., has also been appointed Agent, Dominion Ex. Co. there, vice F. W. Forster, deceased, who was Agent, C. P. R. and Dominion Ex. Co.

C. Stewart, a former employe of the Dominion Ex. Co., at Vancouver, and son of the late T. S. Stewart, at one time Superintendent, Western Division, Dominion Ex. Co., Vancouver, died there recently, aged 29.

The Dominion Ex. Co. has opened offices at Pictou Landing and Trenton, N.S.; Jacquet River, N.B.; St. Maurice and Marcil, Que.; Verwood, and Readlyn, Sask; Okanagan Centre, Matsqui and Spillimacheen, B.C.

The Board of Railway Commissioners has established express delivery and collection limits for Levis, Que., and Liskeard, Ont., and has also established new limits for Edmonton, Alta., cancelling those previously fixed by orders 14987, Sept. 11, 1911, and 15759, Jan., 1912.

The Board of Railway Commissioners has ordered the reduction of express companies' charges for the handling of freight bills of lading, and money collections in connection therewith. Under present conditions the companies forward bills of lading for freight shipments, and charge 1% for the collection and return of money. The new rule provides for a charge of ⅛ of 1%, with a minimum of 1% on $100 on one company's line, and 1½% when over more than one company's line.

The Dominion Ex. Co. has issued instructions to its agents, stating that it has been brought to the company's attention that certain agents have been altering the charges on through waybills of foreign companies, covering business from the U.S., to agree with the rates as published in the Dominion's Joint Basing Transfer Tariff. Under a ruling of the Interstate Commerce Commission, the tariffs issued by the company originating the traffic must govern the charge, and hence agents receiving goods on through waybills should not change the charges according to the rates in the Dominion Ex. Co.'s tariffs.

Regina Municipal Railway.—Following is the operating account for Oct., 1913:

Gross earnings	$22,430.29
Maintenance of way and structures	$117.95
Maintenance of rolling stock	447.36
Purchased power	5,697.15
Conducting transportation	10,248.40
General expenses	1,671.24
	$18,182.10
Interest and sinking fund charges	6,205.63
	$24,387.73
Deficit	$1,957.44

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Canadian General Electric Co. has issued bulletin No. 4131 on storage battery, industrial and mining locomotives.

Gold Car Heating and Lighting Co.—Frank A. Purdy, heretofore Manager, Canadian Gold Car Heating and Lighting Co., Ltd., Montreal, has been appointed Sales Manager for Gold Car Heating and Lighting Co., and Canadian Gold Car Heating and Lighting Co., Ltd., with office at 17 Battery Place, New York, N.Y.

The Independent Pneumatic Tool Company, of Chicago, Ill., has arranged with W. H. Rosevear & Son, of Winnipeg, to sell the Thor air tools in Manitoba, Alberta and Saskatchewan. A complete line of air drills and pneumatic hammers, as well as repair parts, will be carried in stock by W. H. Rosevear & Son for delivery direct to users in their territory.

The Ohio Brass Co., Mansfield, Ohio, has issued Construction Details of Some Prominent Catenary Roads, equipped withO. B. catenary materials, either wholly or in part, which contains a number of illustrations, with accompanying construction details. These include the Montreal and Southern Counties Ry., 15 miles of which were installed in 1912.

American Locomotive Co. has issued bulletin 1016, Pacific Type Locomotives, designed to increase capacity without increasing operating costs. It contains a tabular comparison of a large number of this type built by the company, and also a number of illustrations, including the following of locomotives built for Canadian railways:—Canadian Northern, 702; Canadian Pacific, 1,260; Grand Trunk, 199.

The Canadian H. W. Johns-Manville Co., Ltd., has removed its Toronto branch to larger premises at 19 Front St. East, where it has a floor area of about 35,000 sq. ft. in the heart of the wholesale district, which will enable it to carry a larger stock and have ample space for the display of its complete line of J-M asbestos roofings, packings, pipe coverings, building materials, electrical and railway supplies, automobile and plumbing specialties, etc. The entire building will be lighted by its Frink and J-M linolite systems of lighting, and one room will be used for exhibiting these systems.

Titanium Alloy Manufacturing Co., Niagara Falls, N.Y., has issued bulletin 3 of its rail reports, containing sulphur prints and microphotographs showing cross sections of seven standard and seven titanium treated open hearth rails, and claiming that the results of chemical and physical tests show that (1) the treated rails average better ductility, especially in the heads, and strength than the untreated; (2) the treated steel averages an increased shock resistance; (3) treated rails are less easily fractured by fatigue or constantly repeated stresses below the elastic limit, and (4) that treated rails show greater uniformity, indicating freedom from segregation and its attendant evils.

The Canadian General Electric Co., Ltd., has appointed W. G. Gordon, as Transportation Engineer to take charge of all inquiries in connection with electric traction. He is a son of Rev. D. M. Gordon, Principal of Queen's University, Kingston, Ont. After graduating from Cornell in electrical engineering in 1899 he entered the testing department of the General Electric Co. at Schenectady, N. Y. While in the railway construction department he had charge for the General Electric Co. of the installation of the first electrically operated train on the Manhattan Elevated Ry., New York, and later of the installation of the first multiple unit equipments for the Northwestern Elevated Ry., Chicago, Aurora, Elgin and Chicago Ry. Lake Shore Electric Railway, etc., etc. Later, while in the railway engineering department, at Schenectady, he was closely associated with the further development of multiple unit operation for the New York Central lines and the Interboro Rapid Transit Co. He went to Australia in the G. E. Co.'s interests and was Manager and Engineer of the North Melbourne Tramways and Lighting Co., Ltd., later Engineer for the National Electrical and Engineering Co., Ltd., handling the New Zealand business for the G. E. Co., and finally Engineer for the Brisbane Tramways Co., Ltd., until his return to Canada.

The National Steel Car Co., Hamilton, Ont., has appointed J. G. Baukat as its engineer in charge of its passenger car department and of the design and building of cars. He was born in 1870, and was, from 1887 to 1895 working as a machinist and studying engineering, from 1895 to 1898, engaged in draughting and mechanical engineering on marine work, automatic machinery and general machine work; 1898 to 1899, in Port Chester (N. Y.) Ry. service as Assistant Engineer in charge of power and equipment; 1899 to 1902, Designing Engineer in railway department, General Electric Co.; 1902 to 1905, Chief Engineer, Schenectady Ry., in charge of rolling stock, repair shop, track work, trolley lines and construction work, and during this period supervised the construction of 30 miles of high speed interurban railway and the building of new car houses and a power house; 1905 to 1909, Assistant Superintendent of electrical equipment in charge of electrical rolling stock, repair shops and inspection sheds, New York Central and Hudson River Rd.; 1909 to 1910, Chief Engineer, Miami Valley Construction Co.; 1910 to 1911, Mechanical Engineer, Wilmington-Philadelphia Traction Co., in charge of the rehabilitation of rolling stock and equipment; 1911 to 1913, Superintendent of Equipment, Lehigh Valley Transit Co., and latterly connected with a private firm engaged in general electric railway engineering work.

Canada Machinery Corporation, Galt, Ont., has supplied 49 radial drills to the St. Lawrence Bridge Co. for its shop at Lachine, Que., in which the Quebec bridge is being fabricated. The drill has a 76 in. arm and round column. Sixteen of the drills are arranged for mounting on a floor plate, and the remaining 24 are provided with trucks, the trucks having wheels to run on a standard gauge track to be moved along as the work requires. Arrangements have been made for clamping the truck rigidly to the rails, and a prominent feature of the design is the ease with which the truck may be unclamped, moved to a new position and quickly clamped in place again. The drills have been provided with a direct connected motor mounted on the arm, and driving the drill spindle through spiral gears and an intermediate shaft. This, it is claimed, gives an exceedingly direct and strong drive and one possessing several novel features. The bearings, with the exception of the guide bearings of the spindle itself, are all of the full ball bearing type, and the spiral gears are made from high carbon steel and bronze, totally enclosed with a large grease cup for lubrication. The motor is of the variable speed type with a range of speed sufficient for the work required, so that no change gears have been provided in the drive. The feed is of the all geared type, with four changes, and is also provided with a quick return and slow hand motion. The controller handle of the motor travels with a carriage, enabling the operator to start and stop or change the speed without leaving the carriage. The locking of the arm is done by means of the handle travelling with the carriage, this being a great convenience when working at the end of a long arm, as the operator does not need to leave the carriage for each adjustment. The machine, under test, has drilled 1 3-16 in. holes from solid high carbon steel at the rate of 10 ins. a minute, and owing to the ball bearing equipment the very high proportions of the horse power from the motor are delivered to the spindle.

Transportation Conventions in 1914.

Jan. 29-31.—American Electric Railway Association, New York. Midwinter meeting.
May 17-20.—American Railway Engineering Association, Chicago, Ill.
May 18-22.—International Railway Fuel Association, Chicago, Ill.
May 19.—American Association of Demurrage Officers, St. Louis, Mo.
May 20-22.—Freight Claim Association, Galveston, Texas.
May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
May 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.
May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
June 10-12.—Master Car Builders' Association, Atlantic City, N.J.
June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 16.—Train Despatchers' Association of America, Jacksonville, Fla.
June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.
July.—International Railway General Foremen's Association, Chicago, Ill.
Aug. 18.—International Railroad Master Blacksmiths' Association.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly (acting), 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth; 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, J. S. Blanchet, Quebec.
Ship Masters' Association of Canada, Capt. E. Wells, 45 John St., Halifax, N.S.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

SPECIAL NOTICE TO CONTRACTORS.

Re Greater Winnipeg Water Supply.

(Estimated Cost $13,500,000.00.)

Notice is hereby given to contractors that tenders will be invited early in the year 1914 for the construction of works necessary for the delivery of water from Shoal Lake to the Greater Winnipeg Water District. The following is a brief description of the proposed works:—

1. A dyke and channel for the diversion of the Falcon River into Snowshoe Bay.
2. 85 miles Concrete Aqueduct.
3. 10 miles Pipe Line (probably 1916 work.)
4. 900 lin. ft. Tunnel under Red River.
5. 85 Miles of Construction Railway.
6. Telephone Line.
7. Clearing and Ditching.

The fall season of the year affords the best opportunity for inspection of proposed route of the aqueduct, and it is recommended that contractors having a view to tendering on the work should send their inspectors over the line at as early a date as possible.

Particulars as to estimated cost of the work, map of approximate location and profile of aqueduct may be obtained from the undersigned.

M. PETERSON,
Clerk of the Corporation
Greater Winnipeg Water District.

City Hall, Winnipeg,
October 6th, 1913.

NOTE.—Copy of the report of the Consulting Engineers, plan and profile of work, and typical details of design may be seen at the office of this magazine.

SOUTH ONTARIO PACIFIC RY. CO.

NOTICE.—The South Ontario Pacific Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time within which it may construct the railway authorized by section 1 of chapter 151 of the Statutes of 1912, and for other purposes.

Dated at Montreal, this 11th December, 1913.

H. C. OSWALD,
Secretary.

Pringle, Thompson, Burgess & Cote,
Ottawa agents.

GRAND TRUNK RAILWAY COMPANY OF CANADA.

NOTICE is hereby given that the Grand Trunk Railway Company of Canada and the Canada Atlantic Railway Company will apply to the Parliament of Canada, at its next session, for an Act confirming and making valid and binding an agreement providing for the amalgamation of the said two companies and the formation thereby of one company under the name of The Grand Trunk Railway Company of Canada, and authorizing the issue by said Grand Trunk Railway Company of Canada of such additional amounts of stock of the said company as may be necessary for the purpose of carrying out the terms of the said agreement, and for other purposes.

Dated at Montreal this 3rd day of December, A.D. 1913.

W. H. BIGGAR,
Solicitor for the Applicants.

CANADIAN NORTHERN RAILWAY COMPANY.

NOTICE is hereby given that the Canadian Northern Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct the lines of railway authorized by the Statutes of Canada for 1912, chapter 77, section 3 (hereinafter called the said Act), shortly described as follows:—

Regina southwesterly to international boundary.

Battleford westerly to the head waters of Brazeau River.

Regina northerly to Humboldt, thence to Pas Mission, and from a point on the line between Humboldt and South Saskatchewan River north-easterly to crossing of South Saskatchewan River by company's Prince Albert branch.

Also the lines of railway authorized by section 4 of the said Act, namely:

From Calgary westerly to Cochrane, Exshaw and Banff, and from Cochrane northerly to intersect the company's line near Pigeon Lake.

From Cochrane southerly to Nanton.

Also to confirm and ratify a lease from the Canadian Northern Montreal Tunnel and Terminal Company, Limited, to the company and to the Canadian Northern Quebec Railway Company and the Canadian Northern Ontario Railway Company, respecting the terminals and tunnel at Montreal.

Also to confirm the application of the company's navigation rights and facilities to any ports or places, whether Canadian or foreign.

Also to confirm and ratify an agreement between the Grand Trunk Pacific Railway Company and His Majesty the King respecting the western entrance to terminals at Winnipeg.

Also to confirm and ratify an agreement between the company and the Midland Railway Company of Manitoba respecting the operation of the joint section between Emerson and Portage Junction.

GERARD RUEL,
Chief solicitor.

Toronto, 10th December, 1913.

GRAND TRUNK RAILWAY COMPANY OF CANADA.

NOTICE is hereby given that the Grand Trunk Railway Company of Canada will apply to the Parliament of Canada, at its next session, for an Act—(a) providing for the holding of one annual general meeting of the company in each year, and for the submission once a year to the shareholders, debenture stock holders, and auditors, of statements of account and balance sheets; (b) authorizing the directors, if profits be deemed sufficient, to declare and pay interim dividends for the first half of any year, notwithstanding that statements of account and balance sheets for such half year shall not have been previously submitted to the shareholders; (c) authorizing the creation and issue for the general purposes of the company of additional Grand Trunk Consolidated Debenture Stock, bearing interest at four per cent. per annum, to an aggregate amount the annual interest upon which shall not exceed £100,000 sterling, and for other purposes.

Dated at Montreal this 3rd day of December, A.D. 1913.

W. H. BIGGAR,
Solicitor for Applicants.

KETTLE VALLEY RAILWAY CO.

NOTICE.—The Kettle Valley Railway Company will apply to the Parliament of Canada, at its next session, for an Act—

(1) extending the time for construction of the lines of railway described in section 2 (a) (b) (c) of chapter 110 of the Statutes of 1912;

(2) authorizing it to construct a branch from a point at or near the Otter Summit by the most feasible route to the Aspen Grove mineral district not exceeding 30 miles;

(3) ratifying and confirming agreement with the Vancouver, Victoria and Eastern Railway and Navigation Company respecting Coquihalla Joint Section; and for other purposes.

Dated at Toronto, the 15th day of December, 1913.

CHAS. B. GORDON,
Secretary.

Pringle, Thompson, Burgess & Cote,
Ottawa Agents.

ALBERTA CENTRAL RAILWAY CO.

NOTICE is hereby given that the Alberta Central Railway Company will apply to the Parliament of Canada, at its next session, for an Act ratifying and confirming an agreement wit hthe Canadian Northern Western Railway Company, respecting Rocky Mountain House Joint Section in the Province of Alberta.

Dated at Montreal, 18th December, 1913.

H. C. OSWALD,
Secretary.

Pringle, Thompson & Burgess,
Ottawa Agents.

FOR SALE CHEAP.

2 Westinghouse no. 56 armature bores.
3 Westinghouse no. 3 armatures in good operating condition.
30 miles D.B. no. 9 iron weatherproof wire, new, in original packages.
32 32 inch steel tired cast iron wheels, M.C.B. standard.
32 34 inch steel tired cast iron wheels, M.C.B. standard.

For particulars apply

STORES DEPARTMENT,
Toronto and York Radial Ry.,
Toronto.

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of all descriptions to stock or special design, apply to
The Canadian Office and School Furniture Co., Limited
Preston Ontario

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We Also Manufacture Pressed Steel Hot Water Heaters
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Nuttall Sleet Wheels and Scrapers

Nuttall Sleet Wheels and Scraper.

6-inch Sleet Wheel.

4-inch Sleet Wheel.

will prepare you to meet the sleet storms that are coming. When your road is equipped with them you need not worry any more about sleet storms and their bad tie-ups.

The Nuttall Sleet Wheel

takes the place of the ordinary wheel in sleety weather.

The Nuttall Sleet Scraper

scrapes the sleet off the trolley wire, and can be slipped on at a moment's notice.

Don't wait till your system is in the grip of a storm—make your preparations now.

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CANADIAN NORTHERN ONTARIO RAILWAY COMPANY.

NOTICE is hereby given that the Canadian Northern Ontario Railway Company will apply to the Parliament of Canada at its next session for an Act extending the time wherein the company may construct the lines of railway authorized by the Statutes of Canada for 1907, chapter 75, section 4, shortly described as follows:—

(a) From its authorized line between Port Arthur and Sudbury, near the head of Long Lake, northerly and westerly to connect with the National Transcontinental Railway east of Lake Nipigon;

(b) From its authorized line between Ottawa and North Bay, near the Township of Chisholm, south-easterly to the Central Ontario Railway at or between Bancroft and Whitney.

Also the line authorized by and described in the Statutes for 1911, chapter 57, section 2, paragraph 7, namely: Port Dover to Kincardine.

Also to confirm and ratify an agreement between the company and the Canadian Pacific Railway Company respecting the terminals at Belleville.

Also to confirm and ratify an agreement between the company and the Georgian Bay and Seaboard Railway Company respecting joint tracks and terminals at Orillia.

Also authorizing the company to enter into agreements, pursuant to section 361 of The Railway Act, with certain other companies.

GERARD RUEL,
Chief solicitor.

Toronto, 10th December, 1913.

TORONTO, NIAGARA AND WESTERN RAILWAY COMPANY.

NOTICE is hereby given that the Toronto Niagara and Western Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may construct the lines of railway authorized by the following Statutes:—

1. Statutes of Canada, 1903, chapter 196, section 7, namely: from Toronto to Hamilton.

2. Statutes of Canada, 1904, chapter 135, section 1, namely: an extension from Hamilton to the international boundary line, near Grand Island or the Town of Niagara Falls and beyond the limits of the Province to a point in the State of New York, with a branch from its authorized line to St. Catharines, passing through Thorold, and also to the Town of Port Colborne.

3. Statutes of Canada, 1906, chapter 169, section 2, namely: from or near Hamilton, westerly through or near Brantford, Woodstock, London and Chatham to Windsor.

GERARD RUEL,
Chief solicitor.

Toronto, 10th December, 1913.

NOTICE.

The General Railway Signal Company of the United States of America, the owner of the exclusive rights to Canadian patents No. 92323, No. 93127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signaling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents to the fact that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.

All inquiries regarding the above should be addressed to The General Railway Signal Company of Canada, Limited, Lachine, Province of Quebec, Canada.

CANADIAN PACIFIC RAILWAY COMPANY.

NOTICE.—The Canadian Pacific Railway Company will apply to the Parliament of Canada, at its next Session, for an Act enabling it to guarantee the principal or interest of bonds, debentures or other securities issued by any company in which it may take, hold and dispose of shares, such companies having for one of their objects the purchase, renting, taking, holding and enjoying of lands, wharfs, docks, warehouses, offices, elevators and other buildings, in Canada and elsewhere, to be used for the purposes of the Canadian Pacific Railway Company or its steamship connections.

Dated at Montreal this 25th day of November, 1913.

W. R. BAKER, Secretary.
Pringle, Thompson, Burgess and Cote,
Ottawa Agents.

CENTRAL ONTARIO RAILWAY COMPANY.

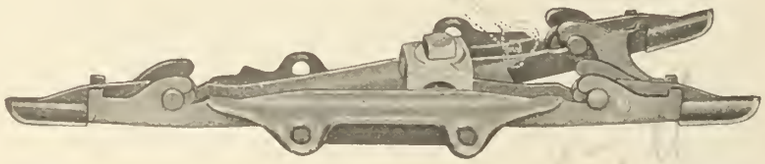
NOTICE is hereby given that the Central Ontario Railway Company will apply to the Parliament of Canada, at its next session, for an Act extending the time wherein the company may complete the line of railway authorized by the Statutes of Canada for 1884, chapter 60 as amended by the Statutes of Canada for 1888, chapter 76, namely:—

From the end of its present line (then constructed to Central Ontario Junction on the main line of the Canadian Pacific Railway) to a junction with the Canadian Pacific Railway at any convenient point between Sudbury Junction and Callander Station.

GERARD RUEL,
Chief solicitor.

Toronto, 10th December, 1913.

In Winter Linemen Will Appreciate The O-B Type D Frog



Has only six parts—one bolt and no nuts.

No small parts to be handled in installing. This is a big advantage especially in winter when heavy gloves or mittens are worn.

Wire is held in pan by tightening bolt on central clamp.

Cam action of renewable bronze tips holds wires firmly in bottom of grooves at ends of pan.

O-B Trolley Catcher Eliminates Uncertainty

When wheel leaves wire, trolley pole is caught after very short travel and held firmly. There is no "stepping up" of pole.

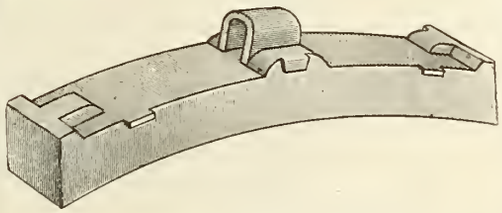
Phantom view shows the centrifugal dogs and guide (A-B). One dog slides over this guide before engaging stop at (B) and is prevented from releasing under any ordinary rebound.

The Ohio Brass Co., Mansfield, Ohio, U.S.A.

Our Improved Reinforced

BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.

25-ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

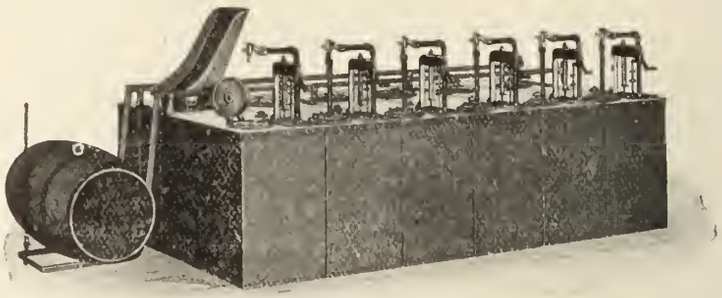
Sherbrooke, Que.

On Land or Sea - By Rail or Boat

Oil is a Necessity

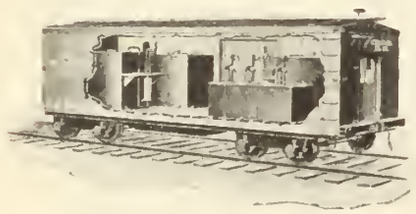
Oil is what makes the wheels go round—annihilates time and space—reduces friction. As a railroad man or boat man, no matter what your position may be, the oil question is with you daily.

Have you, who are responsible for the oil department, given as close attention to storing oils as you have in buying them? If you are still using wooden barrels, "faucet" and "jigger" pump tin containers, you are overlooking a great source of waste.



A Representative Battery Installation for Paint and Lubricating Oils.

Wooden barrels absorb the best part of your oils. Tin containers permit the accumulation of dust, grit and other impurities. Both necessitate the use of measuring devices, which soon become gummed-up, dust-laden and inaccurate. The wooden barrel and tin container are a prolific source of oil-soaked floors, the use of waste, etc., all of which constitutes a deadly fire menace.



A Representative Railroad Oil Supply Car

In the average place where you store your oil, you can literally dig up the dollars out of the floor with a pen knife. Just take a look and see for yourself.

Do away with these "eaters" of profit and install a

Bowser Safe Oil Storage System

These are made to conform to that measure of safety prescribed by the National Board of Fire Underwriters. This is the last word on SAFETY. The pumps measure accurately 277 cubic inches, an Imperial Gallon, vouched for by the Sealer of Weights and Measures. There is no guess-work in such measurement. And each pump records all the oil drawn—they make an errorless iron clerk that never tires.

With a Bowser System the Oils can be handled in a fraction of the time required by the old methods; the oil department can be kept clean; they will save valuable floor space and convert losses into profits. The installation is permanent and will last a lifetime. Made in all sizes from single units up to the largest oil storage systems.

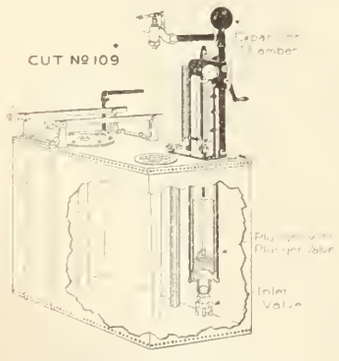


Illustration shows interior view of a paint or lubricating oil unit. Note how the fill, gauge and return tubes are hermetically sealed in oil.

Why not get our literature on this matter and see how much improvement can be made in handling your oil? Ask for illustrated booklet—mailed free upon request.

S. F. Bowser & Company, Inc.

66-68 Frazer Ave.,
TORONTO, ONT., CANADA

Sales Offices in All Centers and Representatives Everywhere.

Made by Canadian Workmen and Sold by Canadian Salesmen.

Original Patentees and manufacturers of standard self-registering pipe line measures, self-measuring hand and power driven pumps, large and small tanks, gasolene and oil storage and distributing systems, oil filtering and circulating systems, dry cleaner's systems, etc.

ESTABLISHED 1885.

Illustration shows a Metal Roll-top Lubricating Oil Outfit.

A Reputation for Reliability As a Railroad Pump

Over 40 years experience in building a pump of this type and its extensive use by many leading railroads have produced a reputation for economy and reliability for the

"American" Deep Well Pump

It not only represents superior material and workmanship but is so designed that repairs can be made in least time and smallest expense in case they are required.

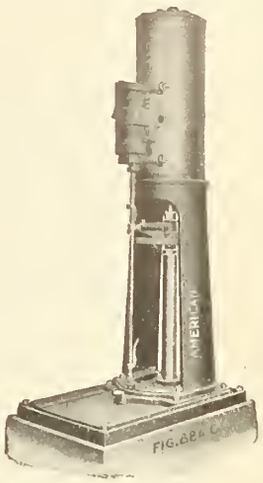
The water cylinders are made entirely of bronze, in both single-acting and double-acting types and they are so designed that all valves can be drawn from the well with the plunger rods without disturbing the pipe connections.

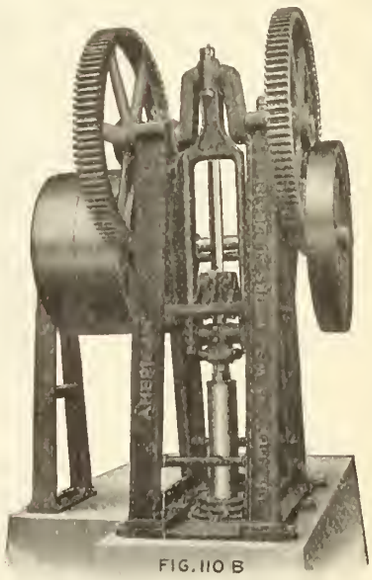
These pumps are equipped with steam heads, pump jacks for belt power or pump jacks directly geared to electric motor. The gears to the jacks are machine cut and the pinions are made of rawhide for noiseless operation.

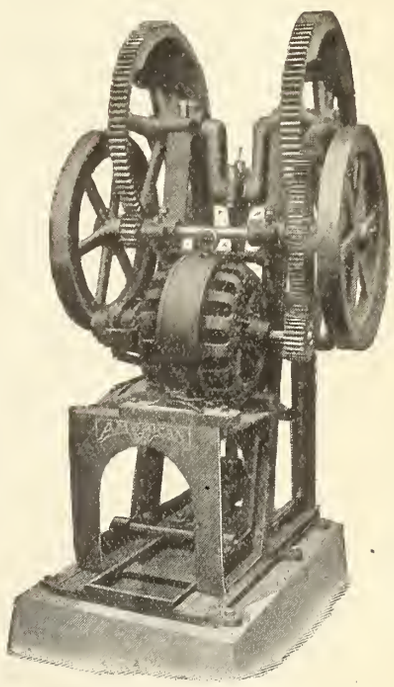
The bearings are large and carefully babbitted and the frames are so designed that they can be slid back on the bedplates for convenience in drawing the plunger rods from the well.

You take no chances in buying an "American" Deep Well Pump, the quality and economy are assured.

They are fully described in catalog No. 111. Write for it.







The American Well Works

General Office and Works: Aurora, Ills., U.S.A.
Chicago Office: First National Bank Building.
Representatives at Montreal, Calgary, Edmonton and Vancouver.

Pure Light!

Electric light, in its brightest, whitest, steadiest form! That's MAZDA Light!

Sure Light!

Light from Drawn Wire Filament! Most dependable and safest to use!

The highest attainment in MAZDA Lamps is found in

Northern Light Mazda Lamps

Because they will withstand the most severe vibration, Northern Lamps are particularly suited to Steam or Electric Railroad Service.

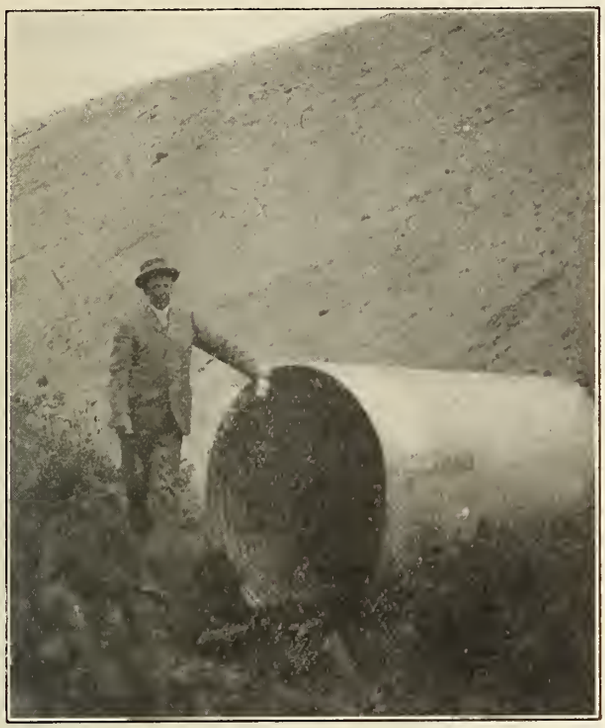
For convenience in carrying and storing, buy Northern Lights by the box. Each lamp packed separately in corrugated paper, five to a box.

15 Watts up to 500 Watts.

Our Nearest House will fill your order.

THE Northern Electric AND MANUFACTURING CO. LIMITED

Montreal Halifax Toronto Winnipeg Regina Calgary Edmonton Vancouver Victoria



Showing a 60" No. 10 Gauge Pedlar Perfect Culvert on Lake Erie and Northern Railway 20 foot fill.

"No Hill too Steep— No Fill too Deep"

if you use a

PEDLAR PERFECT CULVERT

and install it properly.

Our Engineering and Technical Departments are at your service.

Pedlars Perfect Corrugated Culverts riveted or nestable, are standard throughout Canada.

TORCAN METAL **Used Exclusively** TORCAN METAL

The Pedlar People Limited,

Oshawa, Ont.

Montreal Toronto Ottawa London Winnipeg

CHANGE

3 Second-Hand Motor Cars Good as New

At a Very Low Price

We have three second-hand No. 19 Fairbanks-Morse Gasoline Motor Cars, as shown here, that are genuine bargains, as we will sell them at a very low price. These cars have been thoroughly overhauled and are in first-class operating condition. With fair treatment they will give practically as long service as new cars. They will make

No. 19 Fairbanks-Morse Gasoline Motor Car.

First-Class Business Cars for Local Division Officials

Each car is equipped with a Sheffield four-cylinder, 25 h.p. gasoline engine. The engine is placed well up above the track, practically in the car itself, and enclosed in a covered casing. The drive is by a roller chain to one axle.

The car may be operated from either end.

The total seating capacity is 19 persons. There are three long cross seats, each seating five persons, and four single seats at engine casing, all with reversible backs.

Each car is fitted with interior hot water heating coils. The maximum speed is about 20 miles per hour. Weight of car about 9,000 pounds.

Write to us at once for complete specifications and price.

The Canadian Fairbanks-Morse Company, Limited

"The Departmental House for Mechanical Goods"

444 ST. JAMES ST., MONTREAL

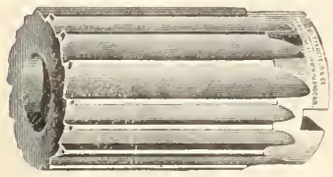
KEEP STANDING
STANDING

Accuracy

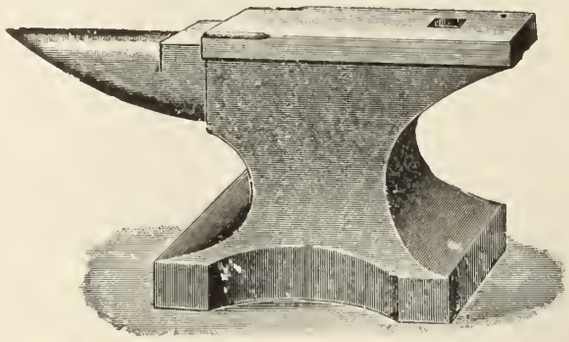
Any manufacturer can make one or one dozen Taps which are accurate and correct in diameter and lead, but to furnish, year after year, thousands of Taps in various styles and sizes that are absolutely accurate and uniform means a splendid organization of help and expensive and modern equipment. All of these are incorporated in the plant which makes Butterfield Taps and Reamers. All sizes and styles carried in stock. Ask your dealer for them or write direct for complete catalogue and discounts.

Butterfield & Co.

Rock Island, Que., Can.



Steel Castings



From 60 to 700 lbs in stock.
Larger sizes made to order.

We manufacture all classes of steel castings.
Anvils of solid steel with special tempered face.

Absolute satisfaction guaranteed.

JOLIETTE STEEL AND IRON FOUNDRY CO., LTD.

Office and Foundry, JOLIETTE, P.Q.

The "Lundy" Shovel

is undoubtedly the best on the market

for Railroad and Contractors work

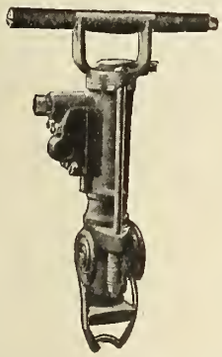
Give it a trial and convince yourselves

The Lundy Shovel & Tool Co., Limited

Office and Works, Peterborough, Can.

THE JACKHAMER

enables you to place your blast holes effectively—where they will do most good. This means that with a Jackhamer you can use less dynamite and get the same results.



It is an all-steel hand hammer drill with an automatic rotation and an automatic oiling device. It also has the non-freezing "Butterfly Valve", an efficient hole cleaning device and a handy steel-holder.

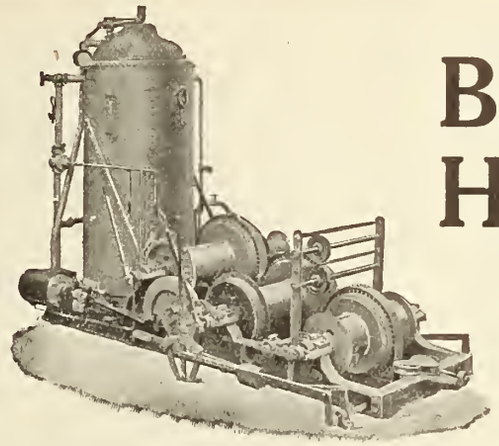
It reduces drilling costs for all down holes of medium depth.

The up-keep is negligible because of the simple all-steel construction.

Catalogue K-68 Describes It.
Ask for a Copy today.

CANADIAN INGERSOLL-RAND CO., LIMITED

Commercial Union Bldg., MONTREAL, CAN.
WORKS: SHERBROOKE, QUE.
SYDNEY - TORONTO - COBALT - S. PORCUPINE
WINNIPEG LETHBRIDGE NELSON VANCOUVER



BEATTY HOISTS

STEAM OR ELECTRIC

We offer immediate shipment from Stock on a number of standard sizes with boilers to pass inspection in any province. Can also make close delivery on hoists with any special features you may desire.

Let us have your inquiry for Hoists, Dredges, Steel Scows, Centrifugal Pumps, Steel Derricks and Williams "Faivrette" Clams.

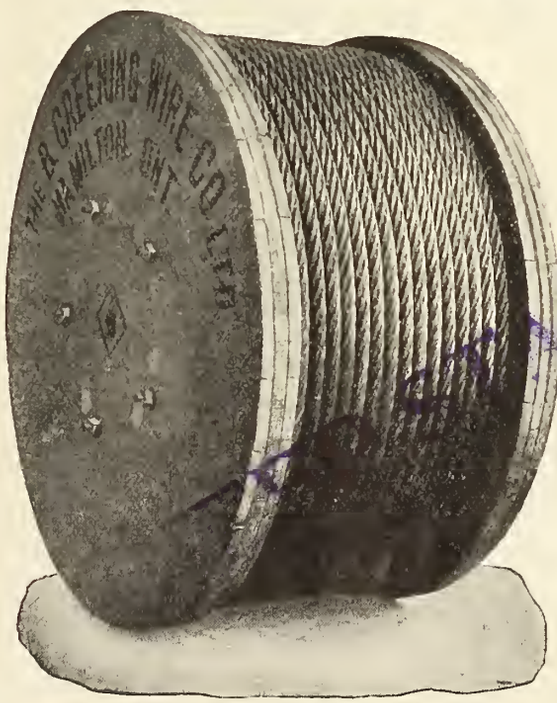
M. Beatty & Sons, Ltd., Welland

Our Agents:

E. LEONARD & SONS, St. John and Calgary
H. E. PLANT, Montreal
H. W. PETRIE, Toronto
R. HAMILTON & CO., Vancouver

All carry Engines in Stock.

WIRE ROPE



Ballast Plow Ropes

Wrecking Ropes

Switch Ropes

Derrick Ropes

Semaphore Strands

Wire Rope Fittings and Grease

MANUFACTURED BY

The B. GREENING WIRE CO., Limited

Hamilton, Ont. Montreal, Que.

Grinding special forming tool of Rex AA steel—Aloxite Wheel

The Man on the Grinder will know

Suppose you put it up to him.

If he is not already using

ALOXITE WHEELS

for tool-room work, for general steel grinding, just order a wheel or two for trial, giving our service department the details of the work. Then give the wheel a real test—judge it by its free, quick, clean-cutting, its ability to stand up on the job—the uniformity of the finish and the amount of work it will do in a given time—it is safe to say that the operator will claim it to be

The right wheel in the right place

THE CARBORUNDUM COMPANY

WORKS:
Niagara Falls, N. Y., U. S. A.
Reisholz Düsseldorf Manchester, Eng.

STORES:
New York Chicago Boston
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Triple Braid Weatherproof Wire.

"Standard" for Your Service

You can depend upon the durability and economy of "Standard" products because they have been tested by over 30 years of service.

We wish to call your special attention now to

"STANDARD"

Bare, Weatherproof and Rubber Insulated Wire

We have large fresh stocks of these materials and can make immediate shipment of large or small orders. It will pay you to get our prices before buying elsewhere.

Write our nearest office

Standard Underground Cable Co., of Canada, Limited
Hamilton, Ont.

Montreal, Que. Winnipeg, Man.
Boston, Mass. Seattle, Wash.

Manufacturers of electric wires and cables of all kinds and sizes, also cable terminals, junction boxes, etc.

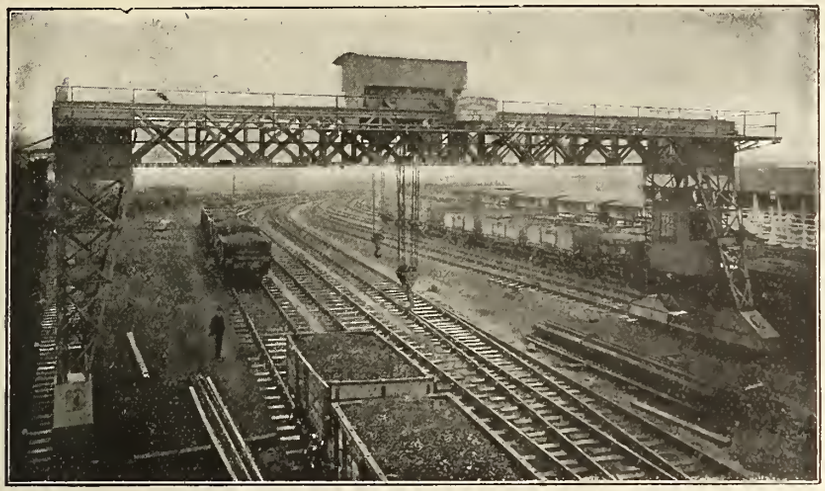
Actual photograph taken on the Chicago, Rock Island & Pacific R. R. with no other light but the Pyle-National Electric Headlight. The station seen is a half mile from the engine.

THIS is the kind of light produced by 19,000 Pyle-National Electric Headlights. Over 2,000 of these lights are in service in Canada. Our new "E" Type Turbo Generating Set will positively show the lowest evaporation of any turbine that has ever been developed for this service per E.H.P. Lowest operative maintenance cost. Every equipment guaranteed.

Pyle-National Electric Headlight Co.

CHICAGO

Canadian Representatives: The Holden Co., Limited, Montreal



The G. and S. W. Rwy., Albert Harbor Goods Station, Greenock, N.B.
"B. & W." 30 Tons Electric Travelling Goliath Crane, 70 Feet Span

Babcock & Wilcox

LIMITED

PATENT

Water Tube Steam Boilers

Over 10,000,000 H.P. in Use

White-Forster Water-Tube Marine Boilers

ELECTRIC CRANES

For Docks, Railways and Warehouses

Our Book STEAM Sent on Request

HEAD OFFICE FOR CANADA,

St. Henry, MONTREAL

Toronto Office, Traders Bank Building

We wish to all of our customers and friends

A Very Happy and Prosperous New Year,

and take this opportunity of thanking you all for the many courtesies extended to us during the year 1913.

The Holden Company, Limited

354-356 St. James Street, Montreal

342 Adelaide St. W., Toronto, Ont.

150 Princess St., Winnipeg, Man.

429 Pender St. W., Vancouver, B.C.

HOTEL BREVOORT

120 W. Madison Street, CHICAGO

The Twentieth Century Hotel **Absolutely Fireproof**

Centrally located. Near-by cars to all railroad Stations. All outside rooms. Single or en suite with connecting bath. Also rooms without bath. Beautiful in decorations and appointments. Restaurant and Grill—table unexcelled. Popular prices. European plan only.

A. D. HANNAH & D. HOGG, PROPRIETORS

JOHN C. O'NEILL, MANAGER

JAS. W. PYKE & CO., LIMITED

CANADIAN REPRESENTATIVES

FRIED. KRUPP, ESSEN, GERMANY

Steel Rails
Wrought Iron Steel-Tyred Disc Wheels
Locomotive and Car Wheel Tyres
Axles, Crank Pins, Forgings, Etc.

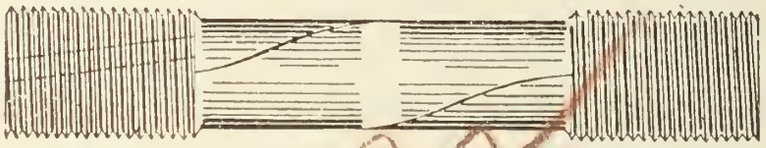
FOR STEAM AND ELECTRIC RAILWAYS

OFFICE: Commercial Union Building,
232 ST. JAMES STREET,

MONTREAL

American Flexible Staybolts

Manufactured in Montreal



Made of the best standard staybolt iron, adding flexibility by process of making as shown above—closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited

MONTREAL WINNIPEG

A Good Start for the New Year

Would be the inauguration on your Line of DEARBORN METHODS OF WATER TREATMENT. The winter season usually gives rise to more serious trouble with the boiler waters, due to low supplies, and greater difficulty of boiler washing due to freezing weather.

Dearborn Treatment, used regularly, prevents trouble with scale, corrosion, leaks, priming and foaming, and increases mileage between boiler washings. The result would be greatly improved operating conditions and greater efficiency from the locomotives.

Advise us that you are ready, and we'll get in touch with your work at once..

Dearborn Chemical Company of Canada, Limited

TORONTO, CANADA

Office, 705 C.P.R. Building Factory, 1220-30 Dundas Street

The Eccentric Gyrating Gears of the CYCLONE

High Speed Chain Hoist give the necessary speed reduction with minimum friction, bulk and weight.

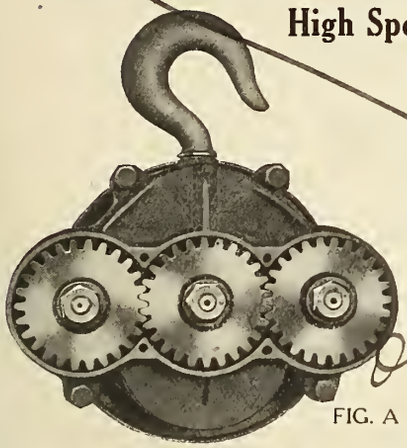


FIG. A

The central spur wheel shown in Fig. A is mounted on the same shaft as the hand wheel. The two outer spur wheels turning with it have at their other ends eccentrics which give a gyrating motion to the yoke shown in Fig. B. This yoke turns the spur wheel shown, which is cast in one piece with the lift chain wheel.

The speed of the lift wheel is determined by dividing the number of teeth in its pinion by the difference between this number and the number of internal teeth in the yoke. Thus a great reduction of speed is obtained without using small pinions or multiplying their number.

The Chisholm & Moore Mfg. Co., Cleveland, Ohio

New York Office: 103 Chambers Street
London Office: 149 Queen Victoria St., London, E.C.

CANADIAN DISTRIBUTORS:

JOHN MILLEN & SON, LIMITED

MONTREAL TORONTO WINNIPEG VANCOUVER

Address all correspondence to 321 St. James St., Montreal

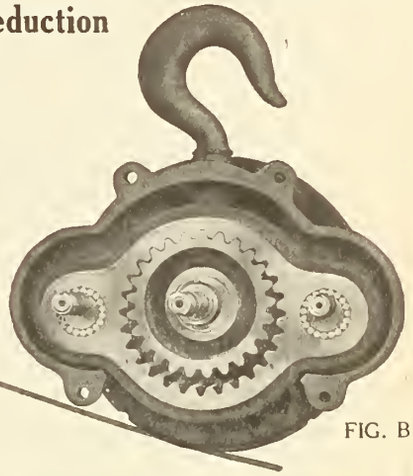


FIG. B

Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1914 deliveries.

Works: Sault Ste. Marie, Ontario, Canada

General Sales Office: 606 McGill Building, Montreal, Quebec

Preserve Your Timber by Creosoting

You will save money by treating Railway Ties, Bridge Timbers, Piles, Poles, Cross Arms, Plank Sidewalks, Wharf Timbers, Crib Work, Wood Paving Blocks, etc., etc., by the creosoting process to resist decay. We have creosoting plants at North Transcona, near Winnipeg, Man., and at Sydney, N.S., and are prepared to carry out any form of preservative treatment of timber.

The Dominion Tar & Chemical Company, Limited

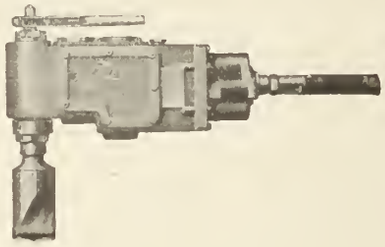
Plants: North Transcona near Winnipeg, Man., Sydney, N.S.

Thor

Close Corner Piston Air Drills

Are the Original No.'s 8 and 9 Close Qaurter Machines

Equipped with Roller Bearings which reduce friction to a minimum. Guaranteed 30 per cent. more efficient than any other make. Sent on trial at our expense.



Made especially for use in close quarters where the ordinary air drill cannot be operated.

BUILT IN TWO SIZES:

No. 8 for drilling up to 1 1-4 in. in diam., Reaming and Tapping up to 1 in.

No. 9 for drilling up to 3 in. in diam., Reaming and Tapping up to 2 in.

INDEPENDENT PNEUMATIC TOOL COMPANY

THOR BUILDING, CHICAGO, ILL. 170 BROADWAY, NEW YORK, N. Y.

Canadian Representatives: H. W. PETRIE, LIMITED, - TORONTO, MONTREAL, VANCOUVER

OXYGEN

By "Claude Liquid Air Process"

Large quantities supplied in high pressure cylinders.
MOST UP TO DATE Welding and Cutting Plants.

Ask for Cata ogues.

L'AIR LIQUIDE SOCIETY

MONTREAL TORONTO

Dominion Coal Company, Limited

Operating Collieries in Cape Breton, and Cumberland Counties, Nova Scotia.
Output 5,000,000 Tons Yearly

DOMINION STEAM AND GAS COALS

Screened, Run of Mine and Slack

SPRINGHILL COAL

Screened, Run of Mine and Slack

Used by Railways, Tramways, Steamships, Manufacturers, Water Works, Light and Power Stations in Ontario, Quebec and the Maritime Provinces, also in Newfoundland and the New England States, Mexico, Sweden, South Africa and the West Indies.

BUNKER COAL

Unsurpassed facilities for bunkering ocean-going steamers at Sydney and Louisburg, C.B., Halifax, N.S., St. John, N.B., and Montreal, P.Q.

Shipping Ports: Sydney and Louisburg, C.B., and Parrsboro, N.S.

FOR PRICES AND TERMS APPLY TO

ALEXANDER DICK, General Sales Agent, MONTREAL, P.Q.

Intercolonial Railway, OCEAN LIMITED

Will leave MONTREAL 7.30 P.M. DAILY

For Quebec, Lower St. Lawrence, Moncton, Halifax.

Direct connection for St. John, N.B., The Sydneys, Prince Edward Island, Newfoundland (except by Ocean Limited, leaving Montreal Saturday).

CHANGE

MARITIME EXPRESS

Will leave Montreal 8.15 a.m. (daily except Saturday), for Maritime Provinces.
Grand Trunk trains to Montreal make direct connection at Bonaventure Union Depot, Montreal

DOMINION IRON & STEEL CO., Limited

MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

We will be pleased to have your enquiries for 1914 shipments

HEAD OFFICES AND WORKS **SYDNEY, CAPE BRETON, CANADA**

The Light of Day on the Right of Way

HEADLIGHTS

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

CAR LIGHTING

Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency and economy. Standard cylinder supplies from one to two months' lighting of the average car.

SIGNALS

Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

Commercial Acetylene Railway Light and Signal Company

103 BAY STREET, TORONTO

Main Office 80 Broadway, New York

Branches: Atlanta, Boston, Chicago, San Francisco

SAFETY FIRST

The best way to educate your employes to the safety habit is by signs.

The "SAFETY FIRST" sign will be before them many times each day and warn them of the constant danger they are subject to in the course of their duties.

Enamelled iron signs, on account of the brilliancy of their colors, attract immediate attention. They never fade and are as good in ten years' time as the day they are put up.

We make to order in any colors, with any lettering or design.

We will be pleased to quote you prices and submit sketches on request.

Acton Burrows
Limited

70 Bond Street, Toronto

SIGNAL TALKS

The only speed limit on your work and ours is thoroughness.

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Enameled iron signs for station names and doors are ideal.

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TENDERS addressed to the undersigned, at Ottawa, and endorsed on the envelope "Tender for Steamer," will be received up to noon of the

EIGHTH DAY OF JANUARY, 1914,

for the construction of a Steel Twin Screw Ice-breaking Steamer of the following leading dimension:—

Length B.P. .....275 feet 0 inches.
Breadth extreme ..... 57 " 6 "
Draft Mean ..... 19 " 0 "
Indicated Horse Power 8,000

to be delivered at the King's Wharf in the City of Quebec.

Plans, tender forms and specifications of this steamer can be seen at the office of the Purchasing Agent of the Marine and Fisheries Department, Ottawa, at the offices of the Collectors of Customs, Toronto, Collingwood and Port Arthur, and at the Agencies of the Department of Marine and Fisheries at Montreal, Quebec, St. John, Halifax and Victoria, B.C.

All tenders must be made with the distinct understanding that the steamer must be built in Canada.

Plans, tender forms and specifications can be procured upon application from the Purchasing and Contract Agent, Ottawa.

The tender form is embodied in the specification.

Each tender must be accompanied by an accepted cheque on a chartered Bank equal to 10% of the whole amount of the tender, which cheque will be forfeited if the successful tenderer declines to enter into the contract prepared by the Department or fails to complete the steamer in accordance with the contract.

Cheques accompanying unsuccessful tenders will be returned.

The Department does not bind itself to accept the lowest or any tender.

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Dept., Marine and Fisheries,
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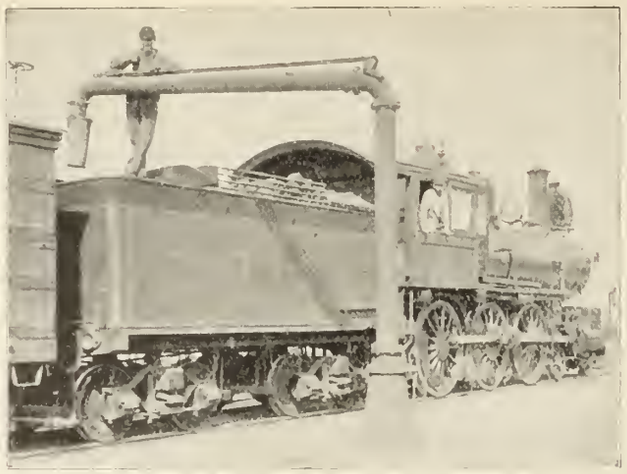

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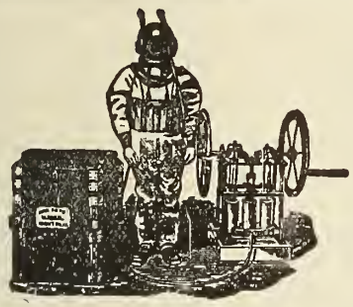

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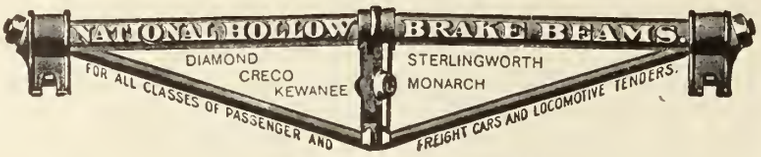

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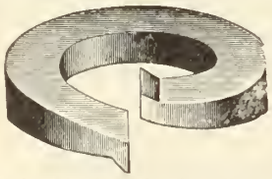

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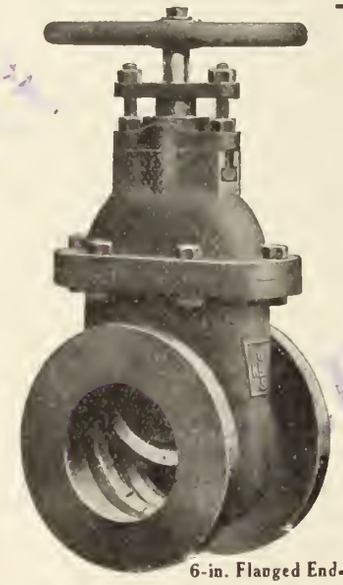

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On construction work you should use a machine that will be busy all the time, because an idle machine means a loss in money.

THE BROWNHOIST LOCOMOTIVE CRANE

Can be kept busy all the time from the beginning to the end on any construction work—because it can be used for excavating with grab or drag-line bucket; handling sand, gravel, stone, etc., with grab bucket or skips; drive piling and sheeting with either steam pile-driver or drop-hammer; place the concrete in elevated forms or in trenches; pull piling and sheeting; place the backfill; switch the cars; and all the miscellaneous hoisting work.

These Cranes are self-propelled; made in various capacities; eight and four-wheel; and with either steam, electric, or gas engine drive.

Our Catalogs I and K show how and where the Crane is used. Write for these Catalogs.

THE BROWN HOISTING MACHINERY CO.,
CLEVELAND, OHIO
New York Pittsburg Chicago San Francisco

CANADIAN CAR
AND
FOUNDRY COMPANY
LIMITED
CAR BUILDERS
GENERAL OFFICES
TRANSPORTATION BUILDING
MONTREAL
BRANCH OFFICE -
TORONTO
WORKS
AMHERST, N.S.
TURCOT, MONTREAL
MONTREAL WEST, QUE.
FORT WILLIAM, ONT.

CANADIAN
STEEL FOUNDRIES
LIMITED
STEEL CASTINGS - MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL
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— MONTREAL
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WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

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Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 192 — TORONTO, CANADA, FEBRUARY, 1914 — Subscription Rates Page 75

Imperial Wire & Cable Company, Limited

Electrical Wire and Cables for all Purposes—Paper and Rubber Insulated Lead Covered Cables; Rubber Covered Wire; Weatherproof Wire; Flexible Lamp Cord; Bare Copper Wire, Etc.

Branch Offices are situated at Toronto and Winnipeg—Write to nearest point for information and prices.

Alberta and British Columbia enquiries will be handled through our Sales Agents, The Northern Electric & Manufacturing Co., Limited, at Calgary and Vancouver

GENERAL RAILWAY SIGNAL CO. OF CANADA, LIMITED

GENERAL OFFICE AND WORKS, : LACHINE, P. Q.

Makers of Standard Appliances as Approved by Railway Signal Association and Board of Railway Commissioners.

ENAMELED IRON SIGNS

For Steam and Electric Railways, Express, Telegraph and other purposes.

ACTON BURROWS LIMITED, TORONTO

The Pratt and Letchworth Co., Limited

Brantford, Ont.

MISCELLANEOUS MALLEABLE CASTINGS AND RAILWAY SPECIALTIES
NON-CORROSIVE MALLEABLE TIE PLATES AND RAIL BRACES

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PRESTON, ONT.

Manufacturers of

Steam and Electric Railway Cars and Special Cars

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MAKERS OF RAILWAY SIGNALS, INTERLOCKING APPLIANCES, HIGHWAY CROSSING GATES AND BELLS

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of Canada, Limited

DUNDAS ONTARIO

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BUILDERS OF

Electric Cars, Fine Carriages, Wagons, Sleighs, Etc.

Office and Works: Slater St., OTTAWA

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TORONTO, ONT.

Manufacturers of

"Cleveland" Pneumatic Tools and "Cleveland" Rock Drills.

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THE WHYTE RAILWAY SIGNAL CO. LIMITED

Foundry and Office: 1882-90 Davenport Rd. TORONTO

FOR TICKET CASES AND COMMERCIAL FURNITURE

of all descriptions to stock or special design, apply to

The Canadian Office and School Furniture Co., Limited

Preston Ontario

Ventilation--Sanitation--Economy--Safety

All Combined in

THE COOPER FORCED VENTILATION HOT AIR HEATER (PATENTED)

Ask for the full story.

We Also Manufacture Pressed Steel Hot Water Heaters

THE COOPER HEATER CO., CARLISLE, PA.

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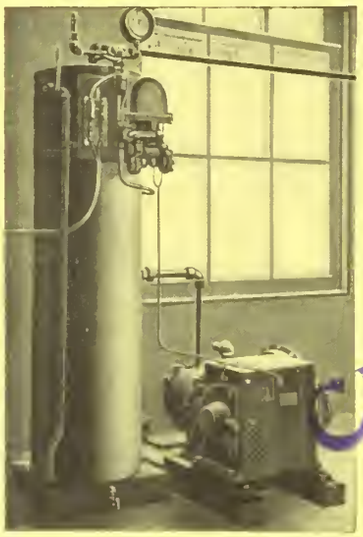
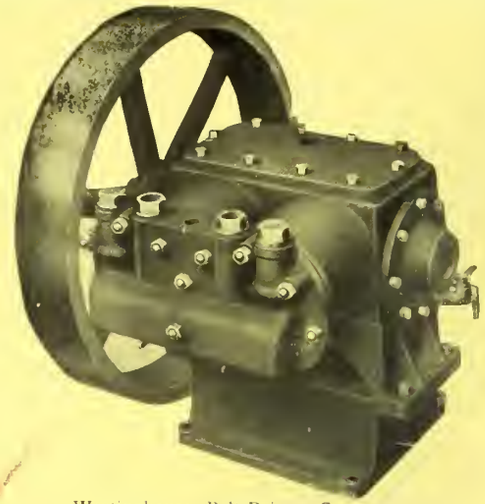
For compact, efficient, reliable units investigate the merits of—



A Westinghouse Motor-Driven Compressor Installation.

Westinghouse Motor and Belt-Driven Air Compressors



Westinghouse Belt-Driven Compressor.

The belt-driven units are in all respects similar to the motor-driven type, except that a belt wheel is substituted for the motor. Both types are designed to be controlled by an automatic governor and are, therefore, adaptable to any kind of service, where electric or steam power is available.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX	WINNIPEG	CALGARY	VANCOUVER
Traders Bank Building	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.	158 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

Cast Iron Car Heater Fittings

We are largest manufacturers in Canada of this class of work

Ret. Bend, Side Outlet

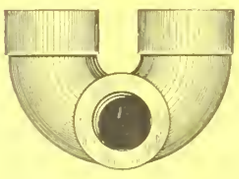


Fig. 933

R. & L. Coupling

Fig. 932

Tee

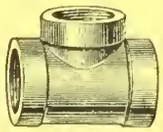


Fig. 927

Double Tee

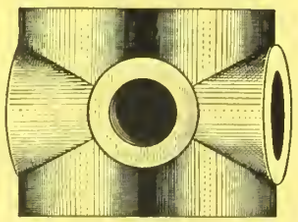


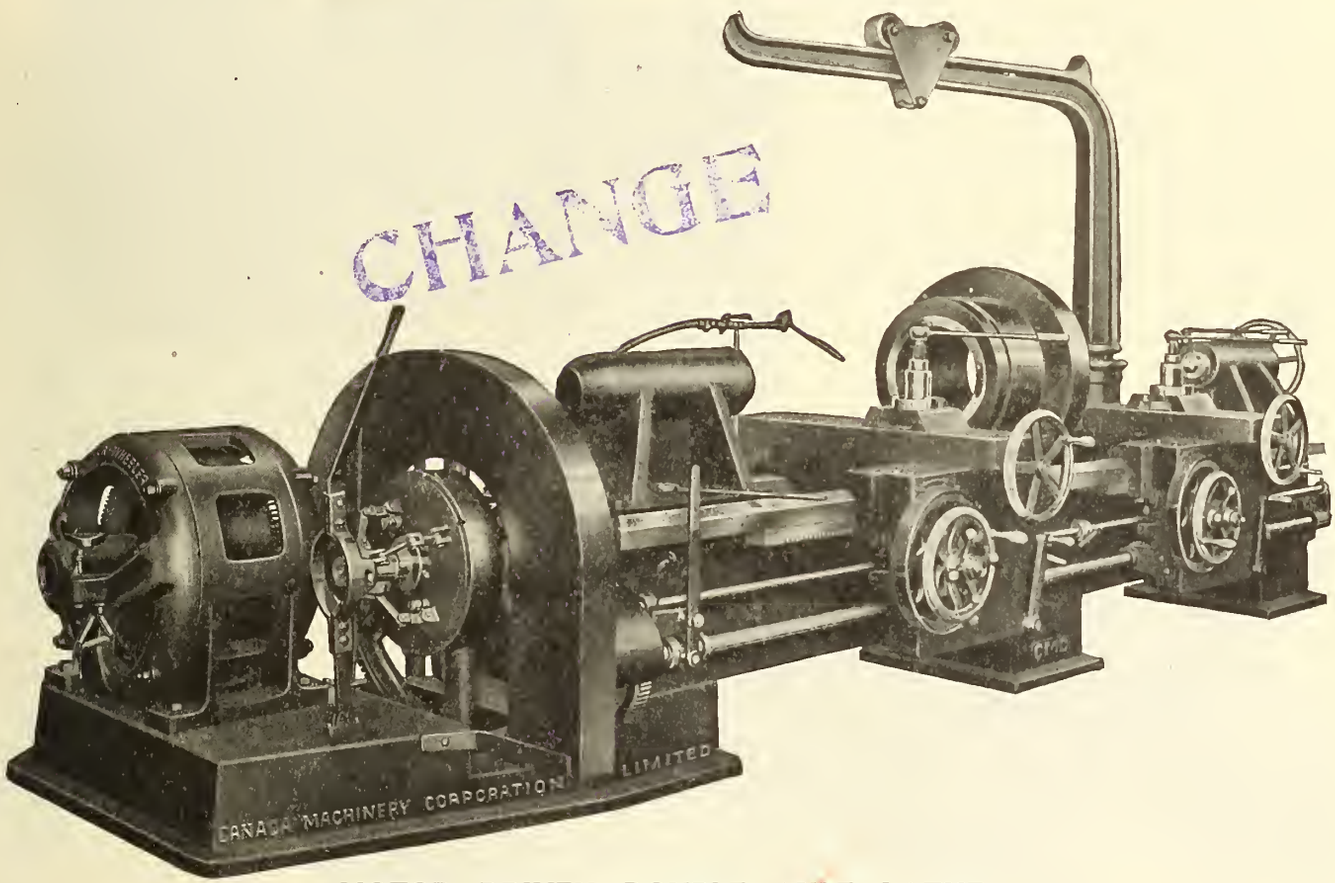
Fig. 930

Large Stock on Hand—Send Specification for Attractive Prices

T. McAVITY & SONS, Limited

Montreal ST. JOHN, N.B. Winnipeg

AXLE C.M.C. LATHE



MOTOR DRIVEN DOUBLE AXLE LATHE.

This Arrangement is Designed for Maximum Output

The friction clutch in the drive makes a very flexible control as starting and stopping is accomplished without loss of time. This is a distinct advance over a direct geared motor drive.

We have just issued our new bulletin No. 1098, fully describing our Axle Lathe. We will be pleased to send a copy on request.

Representatives:—

QUEBEC:
Williams & Wilson, Limited
Montreal

MANITOBA:
The A. R. Williams Machinery Co., Ltd.,
Winnipeg

Canada Machinery Corporation, Ltd.

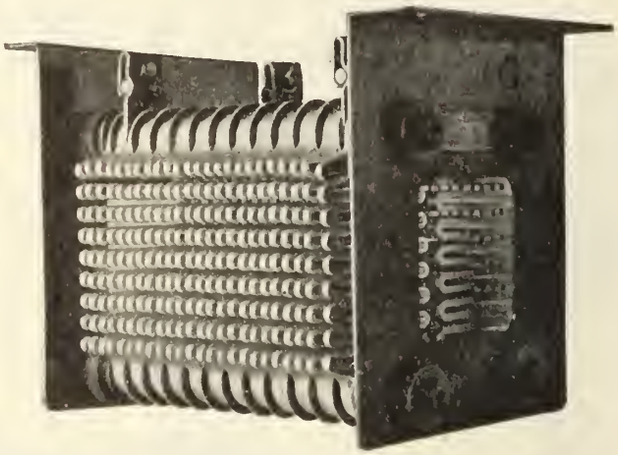
GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.

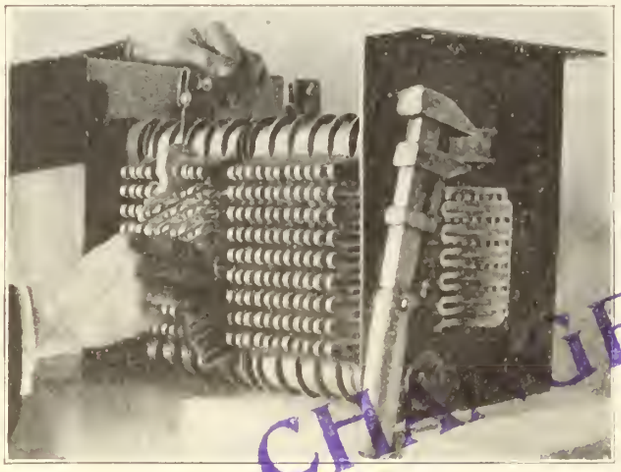
A NEW RAILWAY RHEOSTAT

Our new "R. G." type of rheostat for electric railway service has many valuable features. The breakage of grids is reduced but, if broken, they can be easily replaced. There is greatly improved insulation on tie rods and in washers throughout in place of mica. Sagging and warping from overloads are lessened.

After being assembled, each rheostat is given a complete and thorough test, including a potential of 5,000 volts applied between the frame and all of the grids.



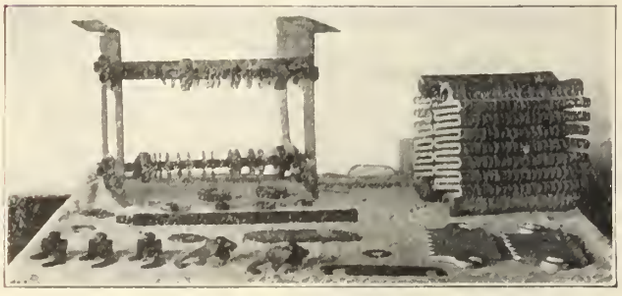
"R. G." Rheostat Assembled.



Grids are Easily Replaced.

A grid broken, may be readily replaced without removing the rheostat from the car; thus saving the time which with other rheostats is required to dismount, dismantle, assemble and again mount on the car. The grids are supported top and bottom by means of slotted lugs, and the openings are designed so that the grids cannot drop out but must be raised when removed. To replace a grid, it is only necessary to loosen the nuts of the supporting rods, when the grid can be removed and a new one inserted without the use of additional material.

The use of a new form of insulation in place of mica for insulating the rheostat tie rods and for insulating washers used in this type of rheostat, has been found most satisfactory in service on some of the largest railway systems in Canada. The greatest permissible creepage surface is used to insulate the grids from the supporting frame. Furthermore the grids are arranged in two sections and therefore there is only one half the potential between any two grids on the same rod.



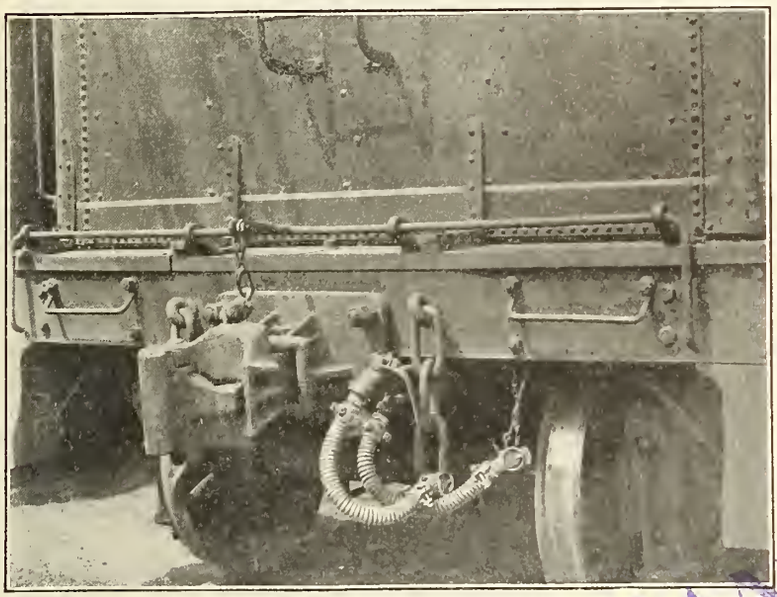
"R. G." New Rheostat Dismantled.

CANADIAN GENERAL ELECTRIC COMPANY,

LIMITED

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

SPRAGUE STEEL ARMOURED HOSE
FOR RAILWAY SERVICE



Sprague Steel Armoured Hose on the Rear of Tender.

The Sprague Steel Armoured Hose is the only steel protected hose at the present time which will satisfactorily meet all requirements of the air brake service.

This hose does not require any fittings that cannot be used with your present equipment, will eliminate your road failures, give extremely long service and be very economical.

CHANGE

Sprague Flexible Steel Armoured Hose can be used advantageously wherever air or steam hose is now employed. Excavating and tunneling contractors, mining companies and quarrymen will find it far more efficient and economical in operating drills and other machinery than any hose heretofore used. Machinists using either air-driven or steam tools will find it much more durable and reliable than ordinary unarmoured or wire-wound hose.

Excavation Work. The Drills are Connected to Flexible Steel Armoured Hose.

CANADIAN GENERAL ELECTRIC COMPANY,
LIMITED

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

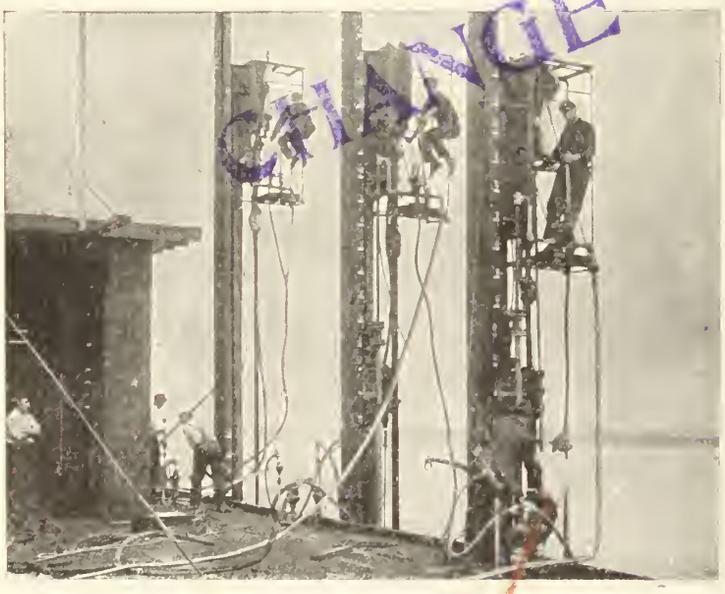
CONTRACTORS' EQUIPMENT

McKIERNAN-TERRY
PILE HAMMERS

The heavy duty pile hammer here shown has been designed and built for driving heavy steel and wood sheet piling, concrete and wooden piles.

Apart from compact and sturdy construction, the simple and ingenious mechanism is worthy of note. No other pile hammer of the same weight strikes as many blows or has the effective energy behind the blow. The rapid stroke is attained by the use of the Accelerating Piston, a most valuable improvement in pile hammer construction, broadly protected by patents, and to be had only with hammers manufactured by this company. No other improvement has ever been applied to a steam or air driven pile hammer which has so greatly increased its piston speed and power of blow.

No. 7 Pile Hammer driving 12-inch heavy section interlocking steel sheet piling 35 ft. long through clay and hard pan for bridge foundation.



Corliss Submarine Drills with 7-inch cylinders used for deepening river channel.

McKIERNAN-TERRY
ROCK DRILLS

The McKiernan-Terry Corliss Valve Drill is economical in power, strikes a quick and powerful blow and has a pull-back of remarkable strength. It is as well adapted for use with air as it is for steam. The great power exerted on the return stroke adapts it for drilling in soft rock which forms a heavy sludge and does not "mud" freely, as well as for use in hard fitchering ground which tends to stick and bind the steel in the drill hole.

CANADIAN ALLIS-CHALMERS,
LIMITED

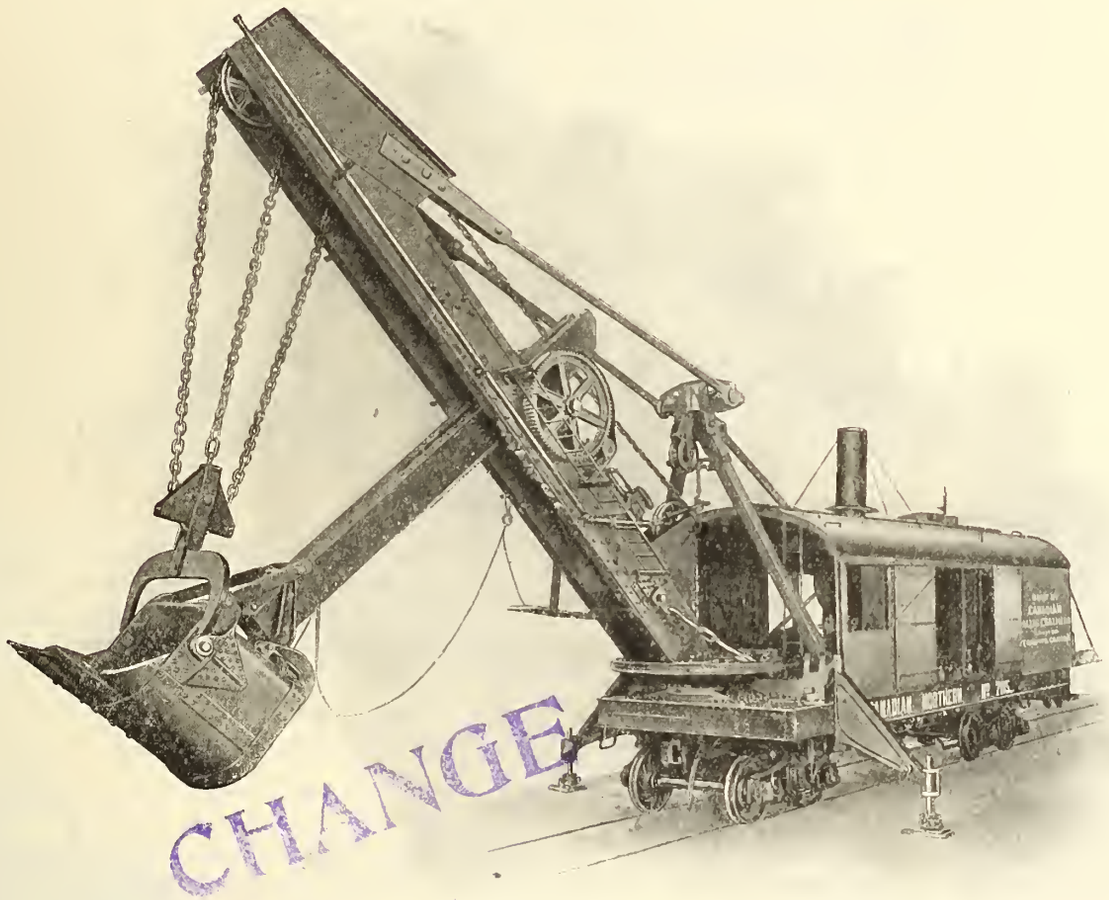
Manufacturers of Air Compressors, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

WE CARRY IN STOCK FOR IMMEDIATE SHIPMENT

70-TON STEAM SHOVELS

THE ONLY HEAVY DUTY STEAM SHOVELS
BUILT IN CANADA



70-C Steam Shovel.

We build in our Davenport Works, Toronto, Steam Shovels
70 to 110 ton, and carry a complete stock of repair parts.

CANADIAN ALLIS-CHALMERS,
LIMITED

Manufacturers of:—Air Compressors, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Turbines, Structural Steel Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

HEAD OFFICES, TORONTO. District Sales Offices, Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

EDISON BSCO PRIMARY BATTERY

FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

EDISON-BSCO
Type 452 Cell,
450 Ampere Hours
Capacity.

$3744.00 Annually

on one division is the saving which one railroad estimates will result from the installation of EDISON-BSCO cells in place of gravity on track and other signal circuits.

Gravity cells average three recharges to oil for Edison, and between recharges the jars must be cleaned. Labor maintenance expense with gravity is, therefore, more than three times that of Edison.

Considering only the material actually consumed, the cost per unit of energy is approximately equal, but in practice the EDISON-BSCO is much more economical, owing to the greater frequency of renewal necessary with the gravity and the considerable waste of unconsumed material with each renewal.

And aside from economy the greater reliability and more uniform voltage of the EDISON-BSCO cell improves the operation of the circuit.

Catalogue on request.

EDISON-BSCO
Complete Renewal

CHANGE

The Cheapest Form of Battery Energy

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

GALENA OILS

HAVE NO EQUAL IN

QUALITY, EFFICIENCY AND ECONOMY

SOLE MANUFACTURERS OF

Celebrated Galena Coach, Engine and Car Oils

LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION A SPECIALTY

KEEP STANDING

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and semaphore lamps, and all lamps for long time burning, avoiding smoked and cracked chimneys and crusted wicks.

TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

WORKS 20

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

Dependable Deliveries on Electric Cars

We have already built Freight and Express Cars and now have under construction Interurban Cars.

The plant is capable of catering to your most exacting requirements, and the process of manufacture and methods of workmanship are open for inspection to all electric railway officials.

We are at all times ready to give your specifications and deliveries our best attention.

THE TILLSONBURG ELECTRIC CAR COMPANY, LTD.

Office and Works, Tillsonburg, Ont.

THE
Steel Company of Canada
LIMITED

Railroad Track Equipment
Angle Bars Tie Plates
Steel Track Spikes Bolts & Nuts

PIG IRON
Foundry Basic Malleable

Car Axles and Forgings
Invincible Fencing
Bar Iron Bar Steel

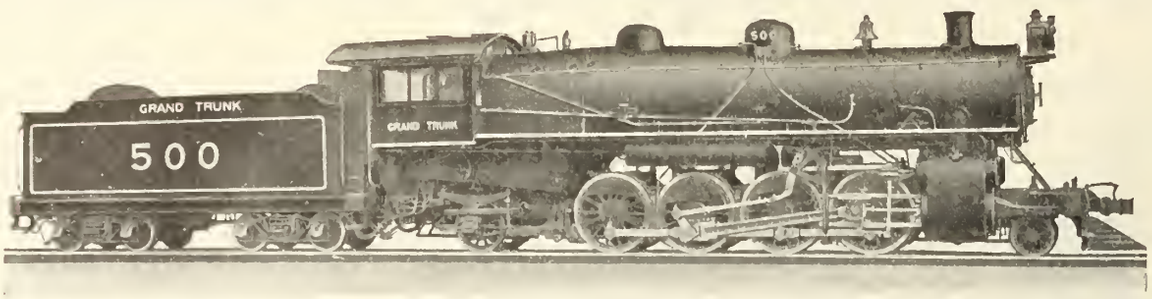
Arm Braces Wood and Machine Screws
Copper Trolley Wire, Telephone and Galvanized Wire
Nails Tacks Wrought Pipe

DISTRICT SALES OFFICES:
HAMILTON, TORONTO, MONTREAL, WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.
H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

INCREASED TRAIN LOADS

MIKADOS VS. CONSOLIDATIONS



Total Weight of Engine, 283,000 pounds; Weight on Drivers, 213,500 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 175 pounds; Cylinders, 27 x 30 inches; Maximum Tractive Power, 51,700 pounds.

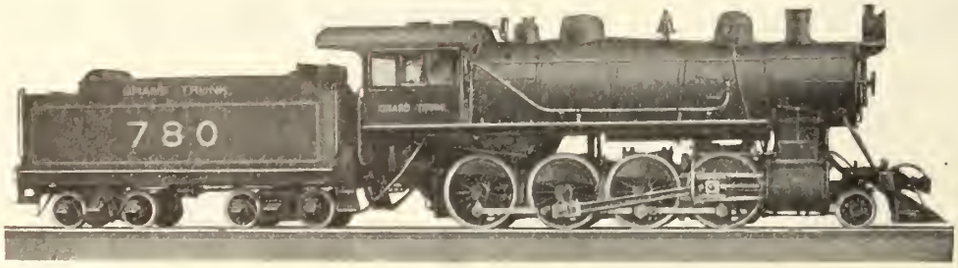
The substitution of Mikado locomotives for Consolidations on the Grand Trunk Railway System has enabled that road to greatly increase train loads and to properly provide for the growth of freight traffic.

This is shown by the following ratings that have recently been put into effect on the Western division:

	Miles	Helper Service	Consolidation	Mikado	Increase
Port Huron to Nichols	156½	None	2000	2800	40%
Nichols to Elsdon	168½	None	1700	2500	47%
Elsdon to Nichols	168½	For 5 miles	2000	2800	40%
Nichols to Port Huron	156½	None	2000	2800	40%

The Western division is made up of broken grades not exceeding 0.6 per cent., except a 5 mile 0.95 per cent. grade from Sedley to Valparaiso, where a helper is required.

Fifty additional Mikado locomotives are now being delivered by this company to the Grand Trunk Railway System.



Total Weight of Engine, 212,000 pounds; Weight on Drivers, 186,000 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 210 pounds; Cylinders, 22½ and 35 x 32 inches; Maximum Tractive Power, 34,400 pounds.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

READING
Multiple Gear Chain Blocks

500 LBS. TO 40,000 LBS. CAPACITIES.

Will lift quicker.
Will work harder.
Will stand harder use.
Will work in any position.
Will work in all kinds of weather.

One man can do more work with a Reading Multiple Gear Chain Block than three men can do with a Differential Block, or two men with a Screw Block.

CARRIED IN STOCK.

MUSSENS LIMITED

MONTREAL	TORONTO	COBALT	WINNIPEG	CALGARY
318 St. James St.	155 West Richmond St.	Opp. Right of Way Mine	259-261 Stanley St.	10th Ave. and 3rd St. East

VANCOUVER	QUEBEC	ST. JOHN, N.B.	HALIFAX
101 Water St.	31 St. Louis St.	57 Smythe St.	78 Granville St.

Uniformity

STANDARD OPEN HEARTH A-RAIL.

Chemical Analysis.

	Ladle Test	Top of Head	Web	Flange
Carbon	0.75	0.67	1.03	0.73
Manganese	0.80	0.705	0.711	0.698
Phosphorus	0.021	0.023	0.045	0.025
Sulphur	0.044	0.026	0.068	0.032
Silicon	0.13	0.13	0.13	0.14

TITANIUM-TREATED OPEN HEARTH A-RAIL —(0.10 TITANIUM).

Chemical Analysis.

	Ladle Test	Top of Head	Web	Flange
Carbon	0.62	0.58	0.65	0.61
Manganese	0.79	0.679	0.705	0.692
Phosphorus	0.016	0.022	0.025	0.024
Sulphur	0.041	0.027	0.030	0.029
Silicon	0.05	0.10	0.10	0.10

The effect of TITANIUM-treatment on this most desirable feature is clearly shown in our Rail Reports—Bulletins Nos. 1, 2 and 3, from which this data was taken.

Standard Open Hearth A-Rail

Physical Tests

	Head	Web	Flange
Impact Resistance	1.00	0.82	1.03
Hardness	219	253	215
Endurance	1065	540	1250

Titanium-treated Open Hearth A-Rail

Physical Tests

	Head	Web	Flange
Impact Resistance	2.10	1.55	2.63
Hardness	210	221	212
Endurance	1070	960	995

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents. Process and Products Patented.

General Offices and Works: Niagara Falls, N.Y.

Pittsburg: Oliver Building

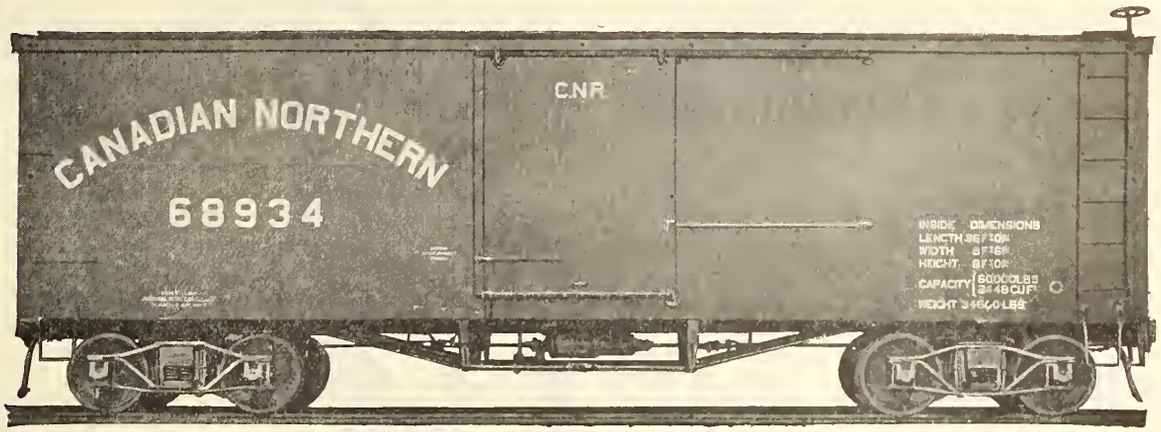
Pacific Coast Agents
ECCLES & SMITH CO.
Los Angeles
San Francisco Portland

TPC
Reg. U. S. Pat. Off.
TRADE MARK.

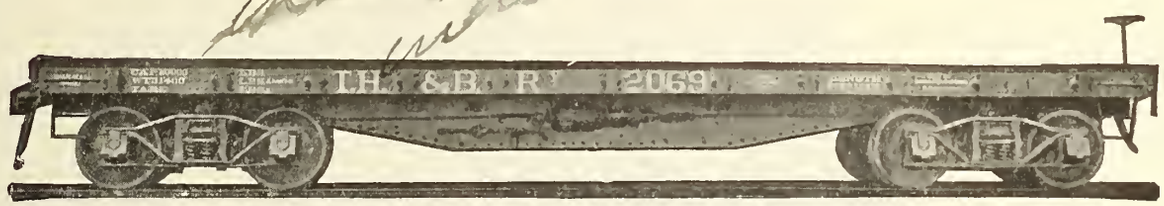
Chicago: Peoples Gas Bldg.

THE PRIMOS CHEMICAL COMPANY
Primos, Pa.

GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Sheffield, England



C. N. R. 30 Ton All Wood Box Car



T. H. & B. Ry. 40 Ton Steel Underframe Flat Car

Bath Tub Bolster construction.

The operating organization of this company is composed of men who have had international experience in the construction of railway rolling stock. The plant is equipped to build freight, passenger and electric car equipment of all classes, and is in a position to give prompt delivery.

Manufacturers in Canada of Damascus Brake Beams and Brascott Ladders

National Steel Car Company, Limited

Montreal Office
Shaughnessy Bldg.

Western Union Code
Cable Address "Nasteel"

Works and Operating Offices
Hamilton, Ont.

Here's Exactly Why Engineers Recommend

Scherzer ROLLING Lift Bridges

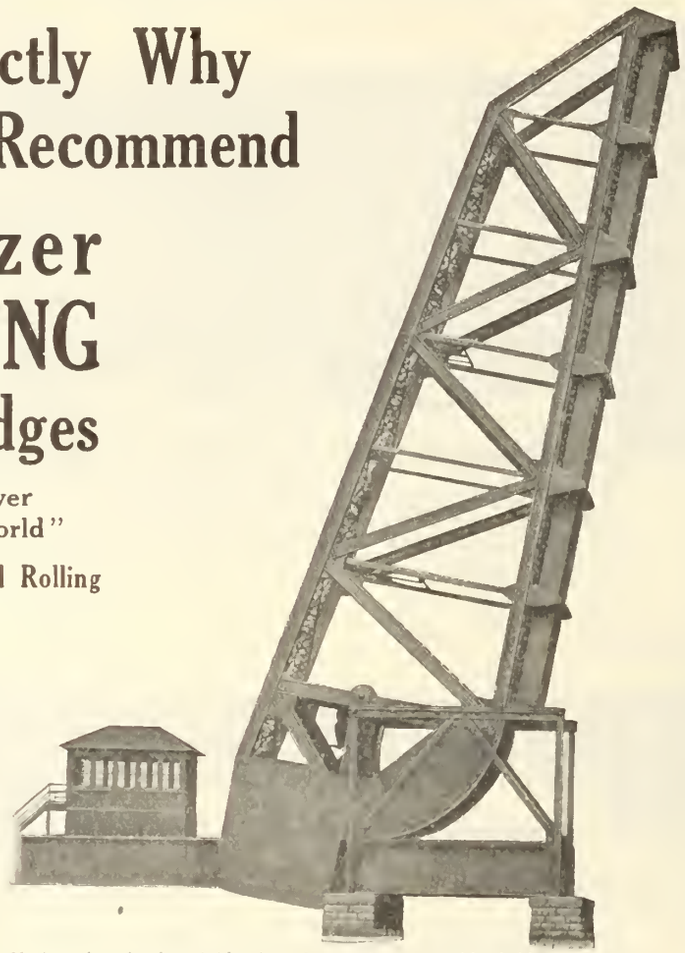
"Used All Over The World"

Designed on the Universal Rolling Principle

200 Scherzer Rolling Lift Bridges now in successful use in the

United States	Egypt
Canada	Russia
England	India
Ireland	Burma
Wales	Hawaiian Islands
France	Mexico
Holland	South America
Belgium	

and other countries.



Notice the simple, rigid, riveted one-piece movable bridge. Extraordinary simplicity and rigidity—greatest efficiency at less cost.

Some Reasons Why The Scherzer Rolling Lift Bridges Are Recommended by Engineers the World Over—

It is a riveted complete rigid structure.

Truss has no pin connections.

Very little machinery in structure—about 5 per cent. of total metal. (Machinery costs about three times as much per lb. as structural steel.)

Over 50 per cent. less MACHINERY than a design with trunnions.

So perfectly balanced as to require little power to operate.

Cost of maintenance low.

Raised and lowered without shock.

Less metal than other designs.

Gives maximum clearance of waterway without fender piles.

Machinery or truss not exposed to damage by boat lurching to side.

Concentrated loading at any point not as great as on a trunnion.

Counterweight is fixed. Height of counterweight not much over ordinary truss.

No high towers.

All parts easy of access.

No costly trunnions or heavy castings liable to be displaced.

No uplift to overcome before bridge commences to rise.

Requires shorter piers than a trunnion.

Trusses roll in direct line of standard distance c. to c. of ordinary trusses.

Grade of railway or bridge could be raised in a simple manner.

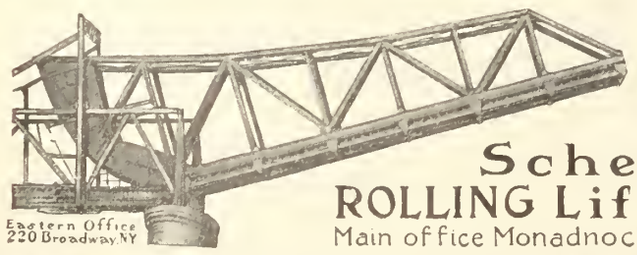
Scherzer ROLLING Lift Bridges cost less to install, operate and maintain—because they are simple, rigid, riveted structures with less metal than any other movable bridge and far less machinery. They are balanced in all positions, minimizing motor power. Their base is rounded just enough to let them roll forward and down, closing them; or roll back and up, opening them. This forward and back motion saves large amounts in material, weight and motive power, as a much shorter span can be used. When open, the bridge is back, away from the channel, preventing accidents from moving boats.

No friction-causing axles, journals or trunnions are used to carry the bridge. There is nothing to lubricate but the small motor and very simple machinery. The curved base rolls on level tracks, using the simple principle of track and wheel used by all railroads. The foundations naturally cost less because the bridge weighs less. No wharfage is needed on either side. New bridges can be added beside the old ones, avoiding wasteful replacement.

A Scherzer ROLLING Lift Bridge can be opened or closed in thirty seconds, a vast saving in time for land and water traffic. Tracks are fastened permanently to the bridge, doing away with rail lifts or end lifts, and preventing accidents. When open, these bridges are barriers against accidents and signal distant traffic to stop.

The Foundations Cost Less Because the Superstructure Is So Simple and Weighs Less.

Send for sketches, estimates and full information, showing how Scherzer ROLLING Lift Bridges are adapted for the widest channels, with particulars of demonstrated efficiency and economy.



Eastern Office
220 Broadway, NY

Scherzer ROLLING Lift Bridge Co.

Main office Monadnock Block Chicago, U.S.A.

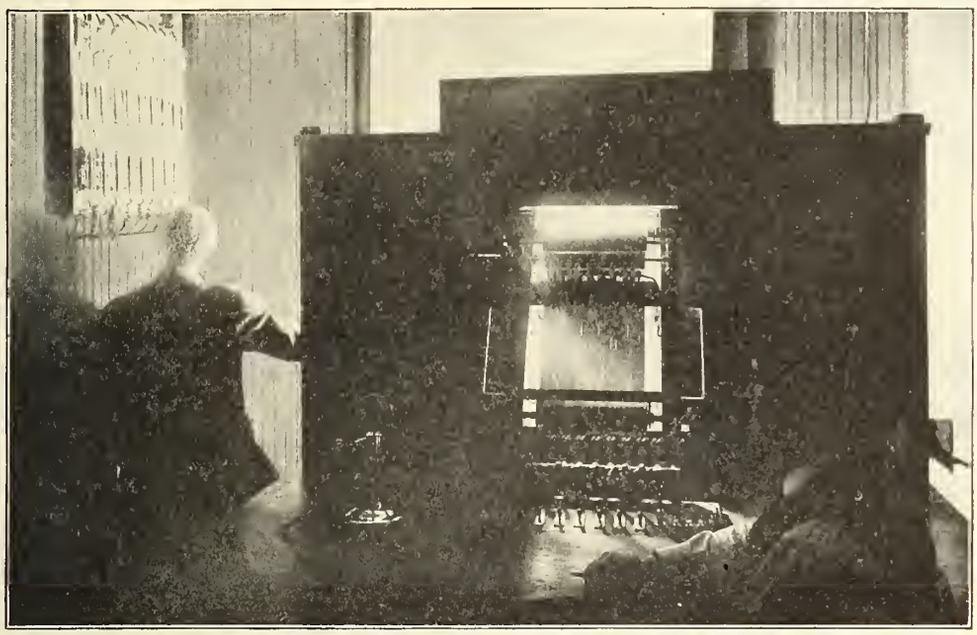
Cable Address
Scherzer Chicago

Meeting One Financial Obstacle to Adequate Signal Protection

There is little doubt that there would be a tremendously greater amount of mileage protected by automatic block if first cost were the only difficulty to be encountered. The great difficulty, however, in the universal use of automatic block track signaling is found in the continuous cost of maintenance.

The advantage in this respect of

Simmen Automatic Block Cab Signals



Flashlight picture of dispatcher's table in service. Observe perforations recording train movements.

is shown by the fact that none of the four roads which are operating the Simmen System has found it necessary to provide any special organization or additional labor for inspection purposes.

The reason for this is that the track and overhead installation of the Simmen System is so simple (involving no track signals, nothing but standard telephone overhead construction and simple signal rails, without any operating parts) that the regular track and line maintenance labor is ample to care for these elements.

All operating electrical apparatus is either in the cab or in the dispatcher's office.

The cab apparatus is easily inspected when the locomotive or car is in for regular inspection.

The apparatus in the dispatcher's office is readily inspected and cared for by the dispatcher with the occasional assistance of a lineman.

The enormous comparative saving in maintenance costs is **proved by the experience of the four roads** on which the **SIMMEN SYSTEM** is now, and has for some time been, standardized.

The importance of this factor in any signal installation is obvious.

THE NORTHEY - SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

A Safe Grade Crossing

CHANGE

The chance of cars being stalled in the path of a locomotive due to trolley jumping is reduced to the absolute minimum when a crossing is protected with **National Trolley Guard.**

Guard is easily installed and requires little maintenance.

Is made of open mesh which offers practically no resistance to locomotive exhausts or heavy winds. Will not collect snow or ice to any extent.

OVER 19 MILES IN OPERATION

For Sale Only By

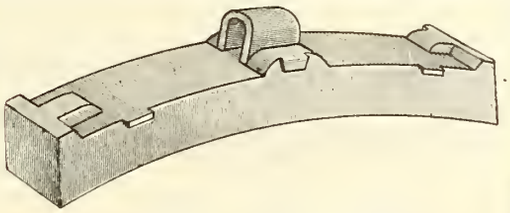
The Ohio Brass Company

Mansfield, Ohio, U.S.A.

Our Improved Reinforced

BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

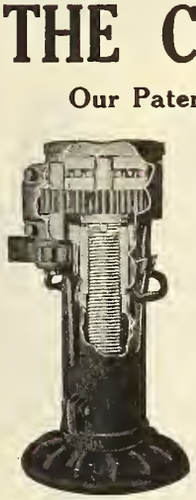
IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.



Showing the construction of our geared jacks.

25-ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

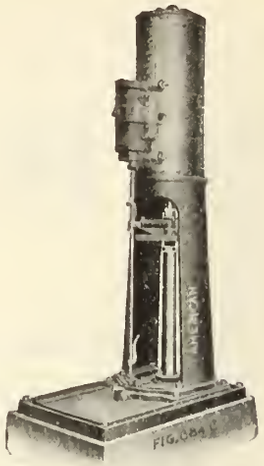
Canadian Brakeshoe Company, Limited

Sherbrooke, Que.

A Reputation for Reliability As a Railroad Pump

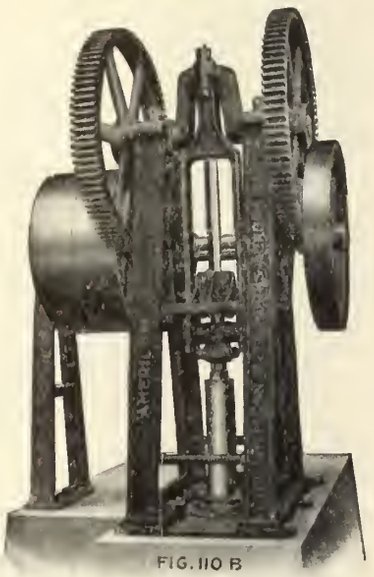
Over 40 years experience in building a pump of this type and its extensive use by many leading railroads have produced a reputation for economy and reliability for the

"American" Deep Well Pump



It not only represents superior material and workmanship but is so designed that repairs can be made in least time and smallest expense in case they are required.

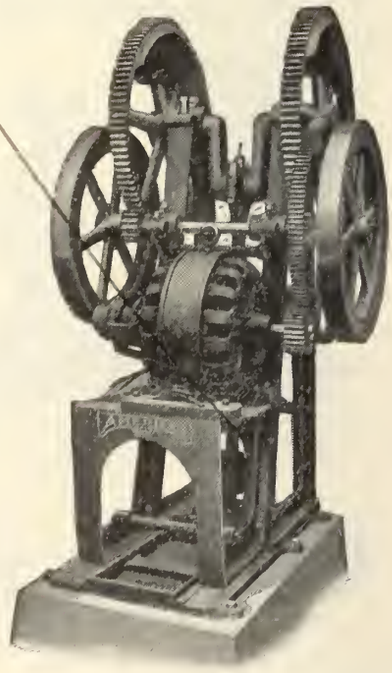
The water cylinders are made entirely of bronze, in both single-acting and double-acting types and they are so designed that all valves can be drawn from the well with the plunger rods without disturbing the pipe connections.



These pumps are equipped with steam heads, pump jacks for belt power or pump jacks directly geared to electric motor. The gears to the jacks are machine cut and the pinions are made of rawhide for noiseless operation.

The bearings are large and carefully babbitted and the frames are so designed that they can be slid back on the bedplates for convenience in drawing the plunger rods from the well.

You take no chances in buying an "American" Deep Well Pump, the quality and economy are assured.



They are fully described in catalog No. 111. Write for it.

The American Well Works

General Office and Works: Aurora, Ills., U.S.A.
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Dispatching Trains by

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TELEPHONES

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Safety First --- Last

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All the Time

The Bond That Ties

your rails into a continuous conductor is the most efficient.

Electric Weld Rail Bonds

become as one piece with the rails, and make it impossible for corrosion to lower the conductivity of the joint.

CHANGE

They Cost Less

first, last, and all the time.

Write for Prices

The Electric Railway Improvement Co.

Cleveland, Ohio

Canadian Government Railways

Intercolonial Railway

Prince Edward Island Railway

The Intercolonial is the only all-Canadian trunk line from Montreal to the Atlantic Sea-board. Two express trains, the Ocean Limited, daily, the Maritime Express, daily except Sunday, leave Bonaventure Union Depot, Montreal, for Halifax, making connections for St. John, the Sydneys, Prince Edward Island and Newfoundland, and are noted for excellence of sleeping and dining car service. The local passenger service on the Canadian Government Lines, in proportion to the population served, is not equalled in America.

The operation of fast through freights, frequency of local and special freights, and the attention given to patrons of the railway, give every satisfaction to freight shippers.

Canadian Locomotives

for contractors, industrial works, railroads, etc.

CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 10 tons. Weight of tender in working order 150,000 lbs.

We have had fifty years' experience as builders of locomotives. Our expert workmen are in many cases the sons or grandsons of men who worked in our shops many years ago. Combined with this long experience and expert workmanship, we have new equipment, efficient management and expert designers.

Special attention is paid to economy of maintenance; also to design of boiler and fire-box to ensure ample steam capacity and economy of fuel.

Duplicate parts are carried in stock for immediate shipment. We build locomotives to meet the Government regulations of the various Provinces. All sizes—all types—all practical gauges.

All materials used in the construction of Canadian locomotives are the very best. They are subjected to careful inspection and test, and any materials failing to meet the highest standards or showing defects of uniformity are rejected. Any materials developing defects in working are also rejected.

Handsome catalogue, 108 pages, 38 illustrations, with valuable tables and data, free to engineers, contractors or manufacturers—on request.

Canadian Locomotive Company, Limited

Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

Canada for the Canadians. *Reciprocity is the Life of Trade.*

SPECIAL ROPES FOR LUMBERING.
WE CARRY IN STOCK ALL SIZES OF WIRE ROPES FOR:
HOISTING-HAULAGE-
TRANSMISSION
GUYS
ETC.

WIRE ROPE

BLOCKS,
CLIPS-SHACKLES,
THIMBLES-TURNBUCKLES
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FITTINGS OF ALL DESCRIPTIONS.

THE DOMINION WIRE ROPE Co LTD
MONTREAL.

We will gladly mail you our latest Catalog upon request.

Special sizes and lengths of ropes made to order.

TATE FLEXIBLE STAYBOLTS

Allow for and accommodate the forces of expansion and contraction along the lines of least resistance.

The Tate Bolt can be longitudinally adjusted to compensate for the difference of expansion of Outer Boiler Shell over Fire Box.

Over 5,000,000 in service

THE RECOGNIZED STANDARD OF FLEXIBLE STAYS

Manufactured and Sold in Canada by

Canadian Allis-Chalmers, Limited

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FLANNERY BOLT COMPANY

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"Marion" Railroad DITCHERS

are specially designed for cleaning out or widening old ditches or cutting new ones along the right-of-way

Exclusive Features

Several exclusive and invaluable features are embodied in all Marion Railroad Ditchers. Three independent sets of engines for governing the hoisting, swinging and thrusting motions. Ditchers are equipped with boom raising and lowering device.

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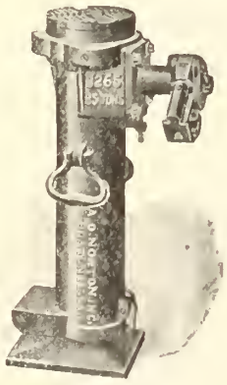
BRANCH WINNIPEG, MAN. | MONTREAL | BRANCH VANCOUVER, B.C.

Norton's Improved

HIGH SPEED JACKS



They lift and lower their full rated capacity

Four Times as fast as other Ball Bearing Jacks of equal capacity.

All Crucible Steel, light and strong.

Send for complete catalogue and Discount.

35 and 50 Tons capacity. **Plain and foot lift.**

Made in Canada by

A. O. NORTON, Inc., COATICOOK, QUE.

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THE DOUBLE TRACK WAY

offers Excellence in Equipment, Excellence in Service

The Grand Trunk Railway System

The Pioneer Railway of Canada

The only double track railway reaching all important centres in Eastern Canada. Fast Limited trains are operated between all important points on the System, including Montreal, Ottawa, Toronto, Quebec, Portland, Boston, New York. Buffalo, Detroit and Chicago. The equipment on the trains of the Grand Trunk is of the highest standard. Electric lighted Pullman Sleeping Cars on night trains. High grade Parlor-Library, Dining and Parlor-Library-Cafe Cars on day trains. Handsome Club Compartment Cars on Night trains between Montreal and Toronto, leave Montreal at 10.30 p.m., and Toronto at 10.45 p.m.

The "International Limited"

The train de luxe, in Canada, runs every day in the year between Montreal, Toronto, Hamilton, London, Detroit and Chicago. This train is one of the finest and fastest long distance trains in the world.

GRAND TRUNK HOTELS

The Chateau Laurier, Ottawa

The new $2,500,000 hotel, situated in the heart of Ottawa, Ont., the capital of Canada, is one of the finest hotels on the Continent. Accommodation, 350 rooms. Rates, $2.00 and upwards. European plan.

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Beautifully situated in Algonquin Provincial Park. The home of winter sports in Ontario. 2,000 feet above sea level. Winter attractions, snowshoeing, skating, tobogganning, skiing. Rates, $2.50 to $3.00 per day. $16.00 to $18.00 per week.

For advertising matter and all particulars, apply to any Agent of the System, including J. Quinlan, Bonaventure Station, Montreal; or C. E. Horning, Union Station, Toronto.

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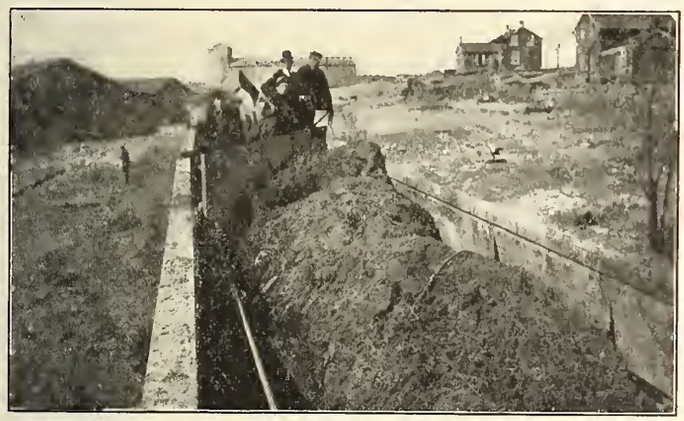
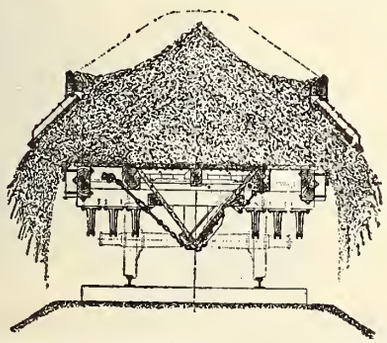
HART CONVERTIBLE CARS ARE MONEY SAVERS IN BALLAST WORK



In Construction Work with Side Plow and Lidgerwood Car

In Ballast Work Center Dump with Rodger Double Plow Distributing Car



Three Cars in One { BALLAST CAR / CONSTRUCTION CAR / GONDOLA CAR

Use centre dump for ballast and maintenance work and save $200.00 per mile over any other method.

Use side dump for heavy construction work.

THE HART-OTIS CAR CO. LIMITED

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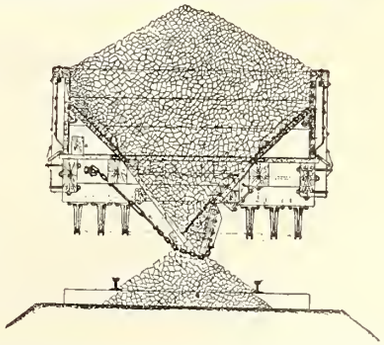

MODERN HIGH-CLASS

ROLLING STOCK

Passenger, Freight
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Electric Railway,
Car Castings,
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CROSSEN CAR COMPANY, LTD.

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MOST MEN

Spend a Large Part of Each Year on Trains

That is Why They Look For

COMFORT CONVENIENCE SERVICE SPEED

And Find Them Only on the

Solid Vestibuled Trains and Finely Equipped Dining and Parlor Cars of the

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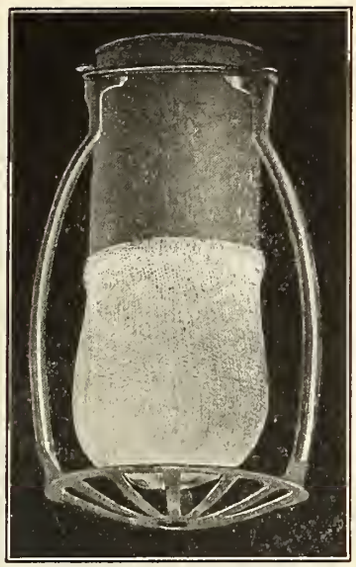
Reaching all the Chief Centres of Canada

For literature, reservations, and all information apply to Local Ticket Agent or to

R. L. FAIRBAIRN, General Passenger Agent, Toronto, Ont.

CANADIAN NORTHERN



Pintsch Mantle Light

No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

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Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALIFORIC VALUE--LOW ASH--UNEXCELLED FOR STEAM-RAISING PURPOSES.
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Western Steel Sales Office: Room 14, Windsor Hotel, Montreal, Que.

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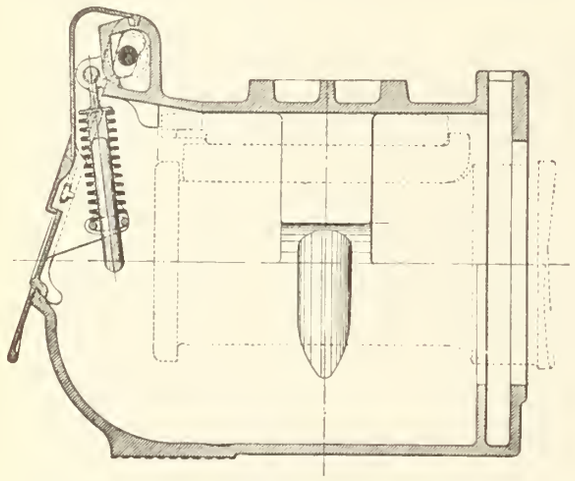
The McCord Malleable Iron Journal Box

MANUFACTURED IN CANADA



The Strongest, Lightest, Tightest Box Made

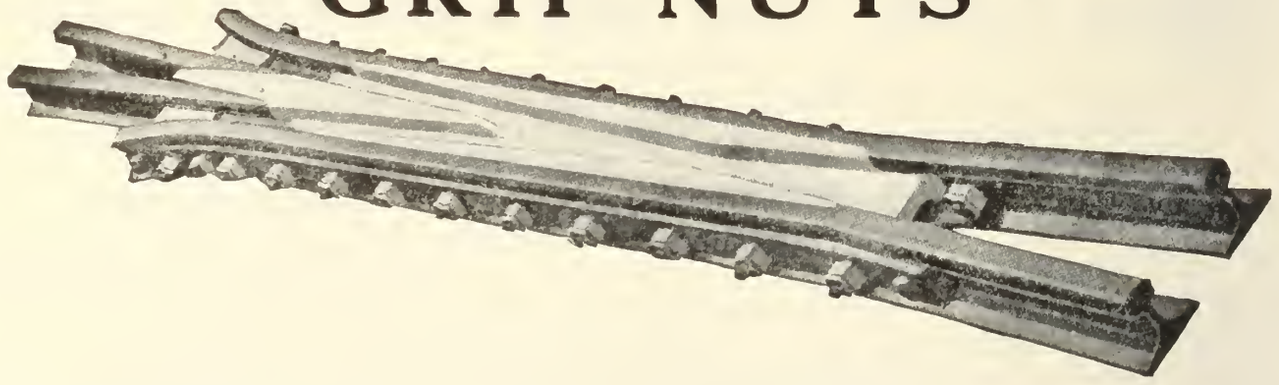
The McCORD Draft Gear
The McCORD Spring Dampener

The McKIM Gasket
The McCORD Force Feed Lubricator

McCORD & COMPANY
People's Gas Building, Chicago

THE HOLDEN CO., Limited
354 St. James Street, Montreal

GRIP NUTS



Are a part of the standard equipment of many of the largest railroad systems. They are wonderfully efficient, and have won their way about as fast as we could keep up with their manufacture. Batteries of presses are cutting millions from specially rolled bars. May be you don't know what this device really is, or will do. We would be glad to tell you and show you. Let us send you samples free.

The use of Grip Nuts on freight cars, particularly the column and oil box bolts, cut down the repair bills considerably by preventing the deterioration due to loss of nuts. They can be wrenched up, too, to take care of wood shrinkage or metal wear. They are **absolutely guaranteed** not to come off full size bolt threads, except with a wrench.

The use of Grip Nuts on passenger cars, locomotives and tenders is increasing so rapidly as to cause surprise even on our part.

The frog illustrated above is manufactured by one of the leading manufacturers of crossings, frogs, and switches. Grip Nuts can be distinctly seen on this frog.

The manufacturers of crossings, frogs and switches prefer them to any other device. They give a well finished appearance to the frog and are there to stay.

Canada Grip Nut Company, Limited

Head Office 803 Eastern Townships Bank Bldg., Montreal

NO. 5 KNUTSON RETRIEVER

Try This Retriever for 60 Days at Our Expense

Ask your conductor these questions:

1. "Do your retrievers fill with water and snow and freeze up?"
2. "When the rope breaks and the tension spring unwinds, is it necessary to bring the car to the barns on such occasions to have the retriever again placed in shape?"

If their answers are "yes," it won't be hard to convince you of the advisability of testing out our No. 5 KNUTSON Retriever which overcomes these troubles, and unless you use the KNUTSON No. 5, they cannot answer otherwise, as it is the only device manufactured which drains thoroughly and permits instant repair.

Just step out and look at one of your retrievers and reason it out for yourself. Then write for one or more KNUTSON No. 5 machines to be tested out at our expense.

KNUTSON No. 5 retrievers are used by some of the largest street railway systems in the country.

THE TROLLEY SUPPLY COMPANY

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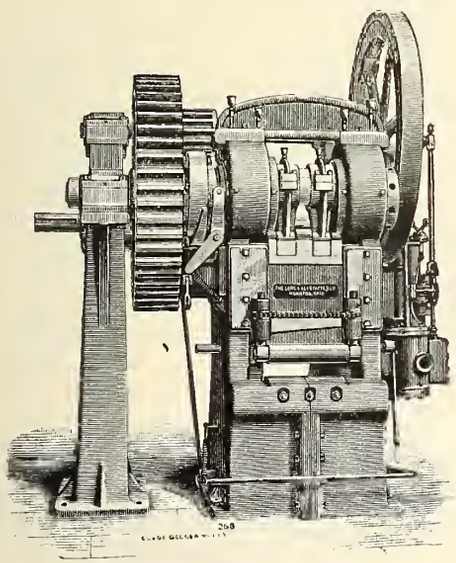

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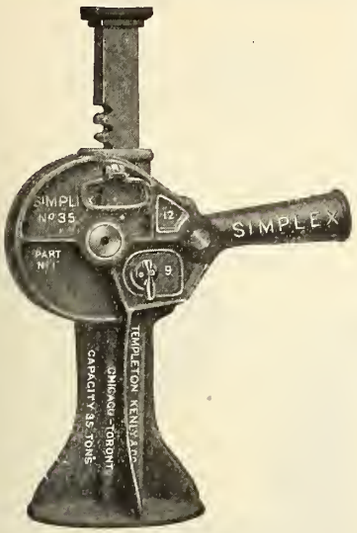

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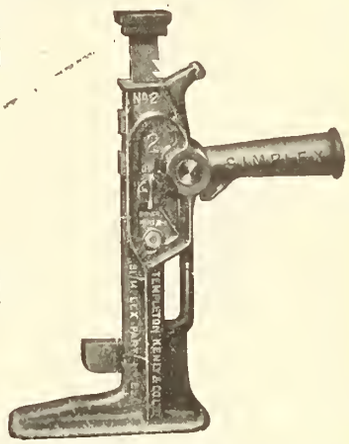

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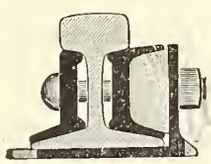

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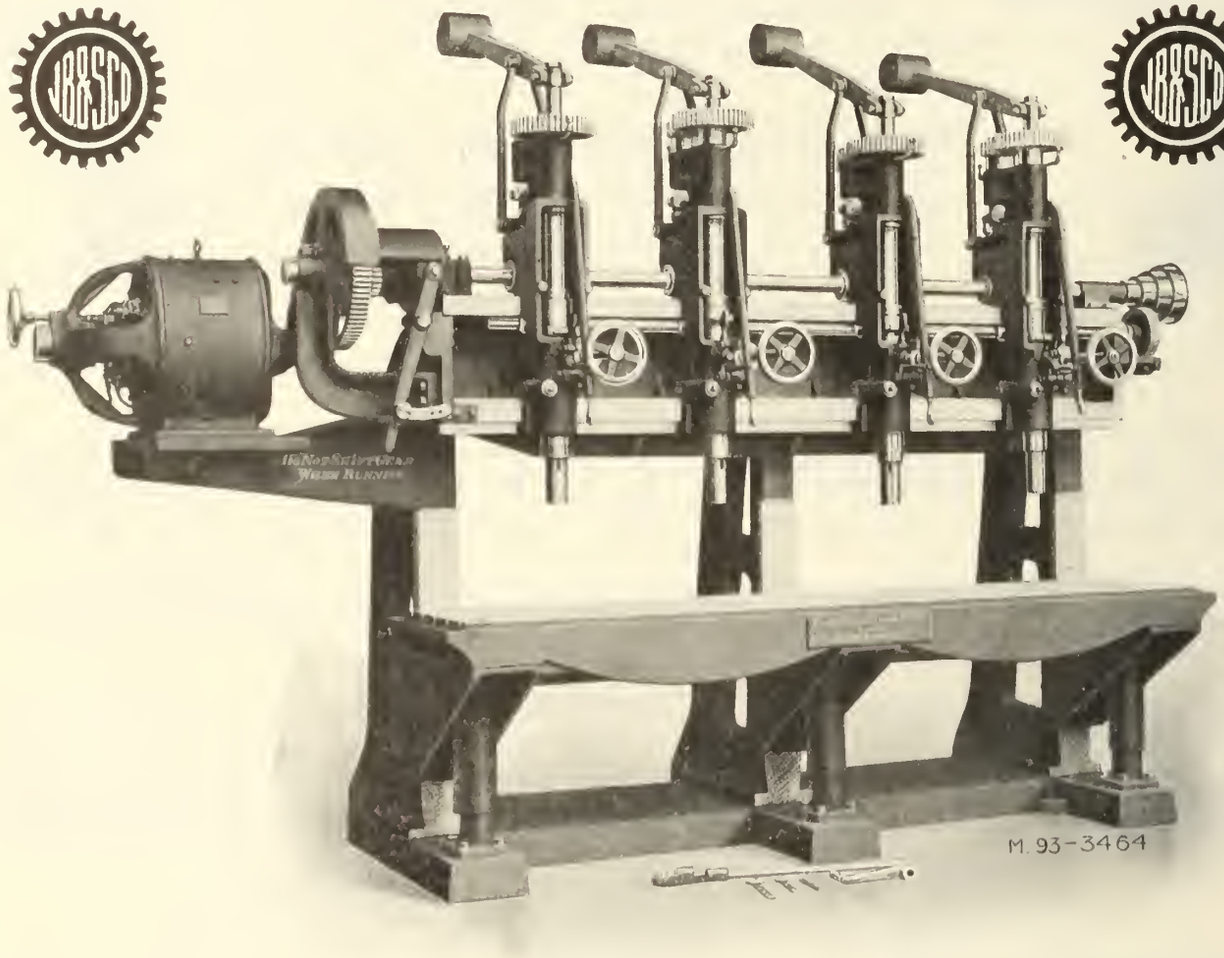

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Canadian Railway and Marine World

February, 1914.

National Transcontinental Railway Car Shops at Transcona.

The locomotive department buildings of the main repair shops which the National Transcontinental Ry. Commission is building at Transcona, Man., were described in Canadian Railway and Marine World for Feb., 1912, previous to which there appeared several progress articles. The locomotive buildings have since been placed in service by the Grand Trunk Pacific Ry. The development of the plans for the car department buildings was delayed for some little time on the change in Government in 1911, and in consequence, while the plans for the buildings themselves were prepared some time ago, and in most cases the buildings completed, it was only quite recently that Transcona shops for the additional service of handling all repairs on the western lines for a considerable time to come at least. The G.T.P.R. took possession of the locomotive department buildings early last year, and is handling at Transcona all the repairs on its lines now in operation.

The site of the shops is on the open prairie, and in order to avoid trouble from flooding by spring freshets, and to secure a better surfacing than that afforded by the prairie soil, the site level has been raised about 4 ft. over the entire area occupied by the buildings, by a heavy gravel fill.

The various buildings have been grouped together as closely as possible to facilitate intercommunication during the severe winter, the intervening distances being made as short as practicable, bearing in mind the advisability of future extensions. The accompanying isometric projection, fig. 1, shows that this feature has been very successfully developed, when it is remembered that the designers had in mind the future extension of the majority of the buildings upwards of 100%, without disturbing the general scheme. The total area of the combined shops will be about 17 acres.

The main buildings are arranged along a midway, which runs across the shop site from the public road to the locomotive house and freight yard adjoining the main line, and are served by a series of standard gauge and industrial tracks, the former connecting through the rear of the buildings to a ladder track at each end of the grounds and thence to the yards, and the latter with industrial tracks along the central midway. Additional intercommunication is obtained through an overhead 10 ton electric travelling crane, which runs the full length of the midway, connecting the front ends of all the main buildings. This crane is electrically operated, and the operator's cage is electrically heated by a heater of the street car type. All exposed parts of the crane are projected by hoods in the usual manner. Wherever possible, the steel runways are carried on abutments from the shop buildings, and the intervening steel columns are carried on concrete piers.

As shown in the isometric projection, the car department buildings are to the north,

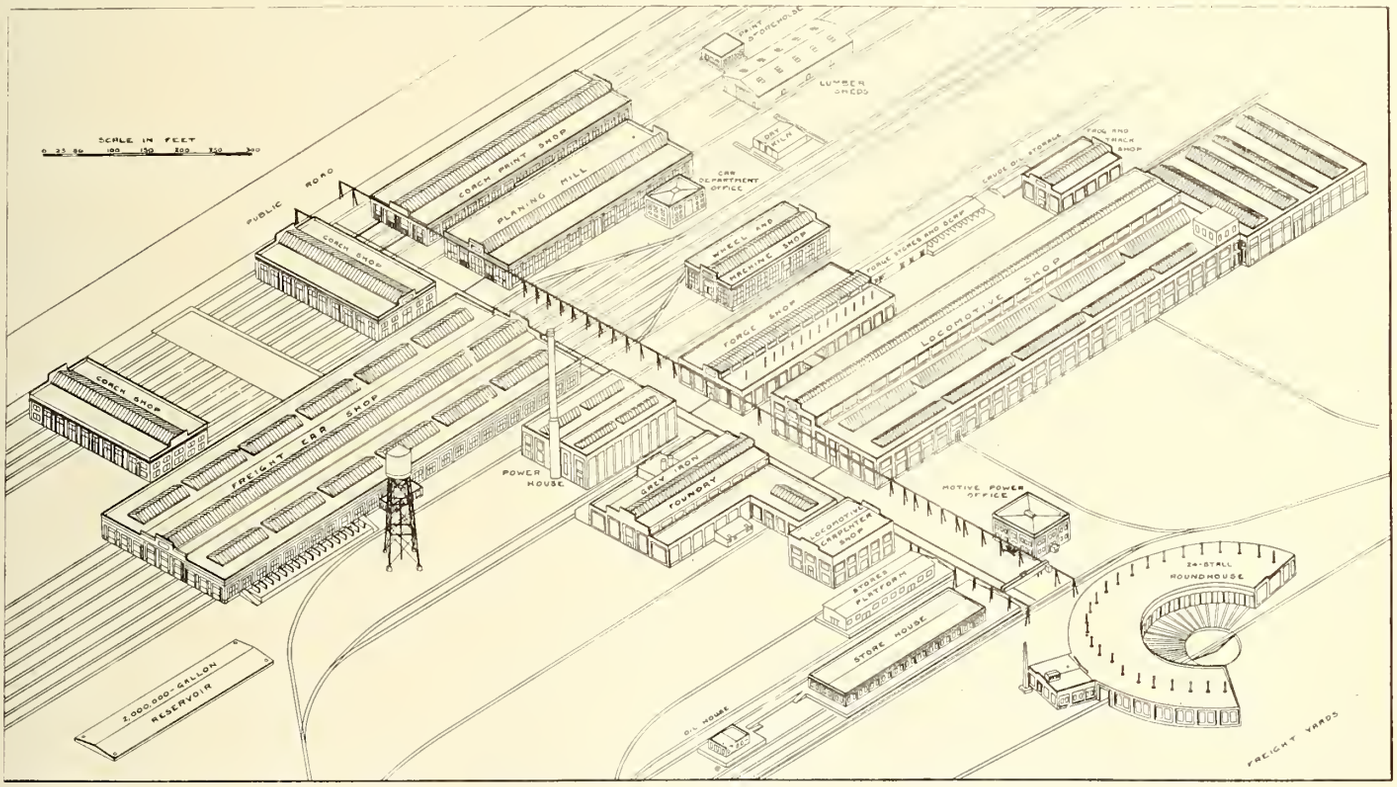


Fig. 1. Isometric Projection of Locomotive and Car Department Buildings, National Transcontinental Railway

the interior arrangement, including the machinery installation, was completely decided on prior to calling for machinery tenders. The plans as originally prepared were revised by W. J. Press, Mechanical Engineer, N. T.R., which involved considerable rearrangement and the selection and installation of machinery, was also carried out under his supervision.

The shops are located in Transcona, six miles east of Winnipeg, on the N.T.R. main line. In conjunction with the shops being built by the Commission at Quebec, a preliminary description of which appeared in Canadian Railway and Marine World for Sept., 1913, they were designed to handle the repairs on the whole 1,800 miles of line from Moncton to Winnipeg. The G.T.P.R., in the construction of its section of the transcontinental line from Winnipeg westerly, did not build any shops, and will use the

and the locomotive department to the south, the midway passing through each group of buildings. The divisional line is the through running track to the north of the power house, the latter being as centrally located as possible to reduce power and heat transmission losses to a minimum, as will be shown later in the article. The foundry and forge shop, being common to both groups, are located in a midway position, with the distinctively departmental buildings to the north and south.

The larger buildings of both groups are of steel construction, with self supporting steel frames on concrete foundations, with concrete walls carried up to the window level. The balance of the superstructure masonry is brick, carried up into a parapet wall all around the building, and capped with concrete coping. The roof drainage is carried down inside the building from re-

ceiving hoppers in the roof, and through running traps to the sewers. All the large buildings are covered with a built up roofing, composed of felt and asphalt, covered with gravel. All windows throughout the plant have ⅛ in. thick ribbed glass, and the skylights are glazed with ⅜ in. wire glass. As additional protection against heavy snow loads on the roof, the skylights are carried on steel ribs, with rolled copper sheathing to carry the glass. Copper is used throughout for all flushing gutters and ventilators.

Mercury arc lights are being used for the principal interior shop illumination, with lamps and reflectors hung high in the shops. This form of illumination is satisfactory, giving an easy, even light, with no sharp shadows. In addition, there will be plug receptacles in all the buildings, at frequent intervals, for the attachment of cable lights. Daylight illumination is especially well provided for by ample window areas, and wide skylights, giving a maximum interior light distribution. The interior of all the shops will be finished in white, enhancing the interior lighting arrangements.

High and low pressure steam, and water, compressed air, and drinking water are distributed about the plant, as explained in an article descriptive of the power house in Canadian Railway and Marine World, Oct, 1913. A tunnel extends the length of the midway, carried on the wall of which are all the mains from the power house, with connections leading from the tunnel to the various shops. On entering the buildings, the piping is carried on the trusses and steel work of the shop. Fuel oil is distributed in piping to such shops as require it. An extensive fire protective system is in use, comprising yard piping, with fire hydrants and hose houses at convenient intervals throughout the grounds. All the electric travelling cranes throughout the shops are operated on 3 phase alternating current, which is transmitted directly from the power house.

The Passenger Car Shop differs from the arrangement in the initial layout, which comprised one building, 115 by 260 ft., on the west side at the north end of the midway, and had four working tracks the length of the shop, each of which could accommodate four cars, making a capacity of 16 cars. There were also to be two service tracks, one between each pair of shop tracks, and along each side, a 16 ft. gallery. In the scheme now under construction, the transfer table type of construction has been adopted, located on the west side of the midway, at the north end, with the easterly of the two shops adjoining the midway. The two shops will each be 120 by 200 ft., with an intervening 75 ft. transfer table, and 100 ft. approach tracks to the buildings, which are therefore 275 ft. apart. Each shop will have 9 working tracks, in as many bays, at 20 ft. centres, with an additional empty bay at the north end of the building.

The shops are the standard construction, of concrete lower wall, carrying a brick upper wall, spanned by steel trusses in the divisional line of each bay. Each bay is entered by double doors from both sides, through 12½ by 16½ ft. openings. Both ends of the buildings have galleries, that at the north end, 14 ft. above floor level, and extending over one bay, and that at the south end 24 ft. 8 ins. above the floor, extending over two bays. Both platforms are carried on the walls and 5 steel columns in the line of the truss above, and are composed of 4 in. reinforced concrete flooring carried on steel I beams. The ground flooring comprises a bed of 6 ins. of bituminous concrete, surfaced with 3 in. yellow pine.

Under all but the south two bays, the side walls are carried to a height of 46 ft. 4 ins., with a clear height under the trusses of 24 ft. 8 ins., which gives a 10 ft. 8 in. headroom on the north end balcony. The walls in the two south end bays are carried to a height of 55 ft. 10 ins., with a height to bottom of trusses of 37 ft., which with the gallery at a level of 24 ft. 8 ins. above the floor, gives a clearance on the latter of 10 ft. The gallery at the north end is low, as there is no working track beneath, but at the south end, greater elevation is required to clear the cars below. The steel roof trusses, at 20 ft. centres, are carried on the walls, and on central columns, of which there is a row down the centre of the shop between the working tracks. These truss columns also act as the central columns of the end galleries. The central depth of the trusses is 8¼ ft., dropping to 4 ft. 5 ins. at the side walls. Down the centre of the roof is a monitor, 29 ft. wide, and 10 ft. high, surmounted by a row of 24 in. copper ventilators, one over each bay.

The east end of the north balconies carries a 12 ft. heating fan, the discharge duct from which leads down to a 5 ft. square concrete heating duct under the floor, extending across the north end of the shop, with longitudinal ducts of similar construction, leading off along each side wall, and along the central row of columns, all under the floor. In the side walls, between each of the doors, there is an outlet moulded in the concrete wall, and along the central row of columns, between each bay, there is a double discharge head. The north balcony also contains the lavatory, which is located on the west end. Both galleries are reached by stairs, centrally located in the end walls, but the south balconies in addition have a 6 by 10 ft. lift, of 2 tons capacity, situated between the two end bays, near the east side. The natural illumination of the shops is good, as in addition to the skylights, there is ample window accommodation in the doors and end walls.

Cars are brought into the shop over the transfer table, which operates the length of the shops, and extends beyond the north end to a through track along the north side of the grounds, over which the passenger cars may be brought from either end of the yard. The transfer table is electrically operated, and the trolley arrangement has been ingeniously devised so as to minimize danger from accidental contact. This feed wire is carried in a channel in one of the walls, the contact shoe being so arranged that it bears upward against the feed wire, the latter carried in the top of the channel.

The Freight Car Shop is immediately to the south of the passenger car shop, abutting on the midway. It is of standard construction, concrete lower wall, surmounted by brick, and spanned by steel trusses, and is 195 by 600 ft., making it second only to the locomotive shop in size. It is divided through its length into three 65 ft. bays, by two rows of columns, supporting the roof trusses, which divide the shop crosswise into 24 ft. sections.

The side bays have a clear height from the floor to the lower chord of the roof truss of 20 ft., the truss itself having a depth of 9 ft. over the row of columns, sloping off to 5 ft. along the wall. In the central bay, there is a clearance of 30 ft., the truss having a depth at centre of 7 ft., sloping in both directions to a depth of 5 ft. over the

Fig. 2. Plan of Main Floor and Galleries of One of the Two Passenger Car Buildings.

columns. Down the centre of each of the bays, there is a 25 ft. wide peaked roof skylight, surmounted by a row of 24 in. copper ventilators, one over each section. The central bay is spanned by a 20 ton travelling crane, which has a 5 ton auxiliary, and which operates the length of the shop. The height to base of crane rail is 22 ft., which is approximately the clearance below the crane itself. The locker rooms and lavatories are contained in 20 by 49 ft. brick annexes, one on the north and the other on the south side, centrally located. The heating

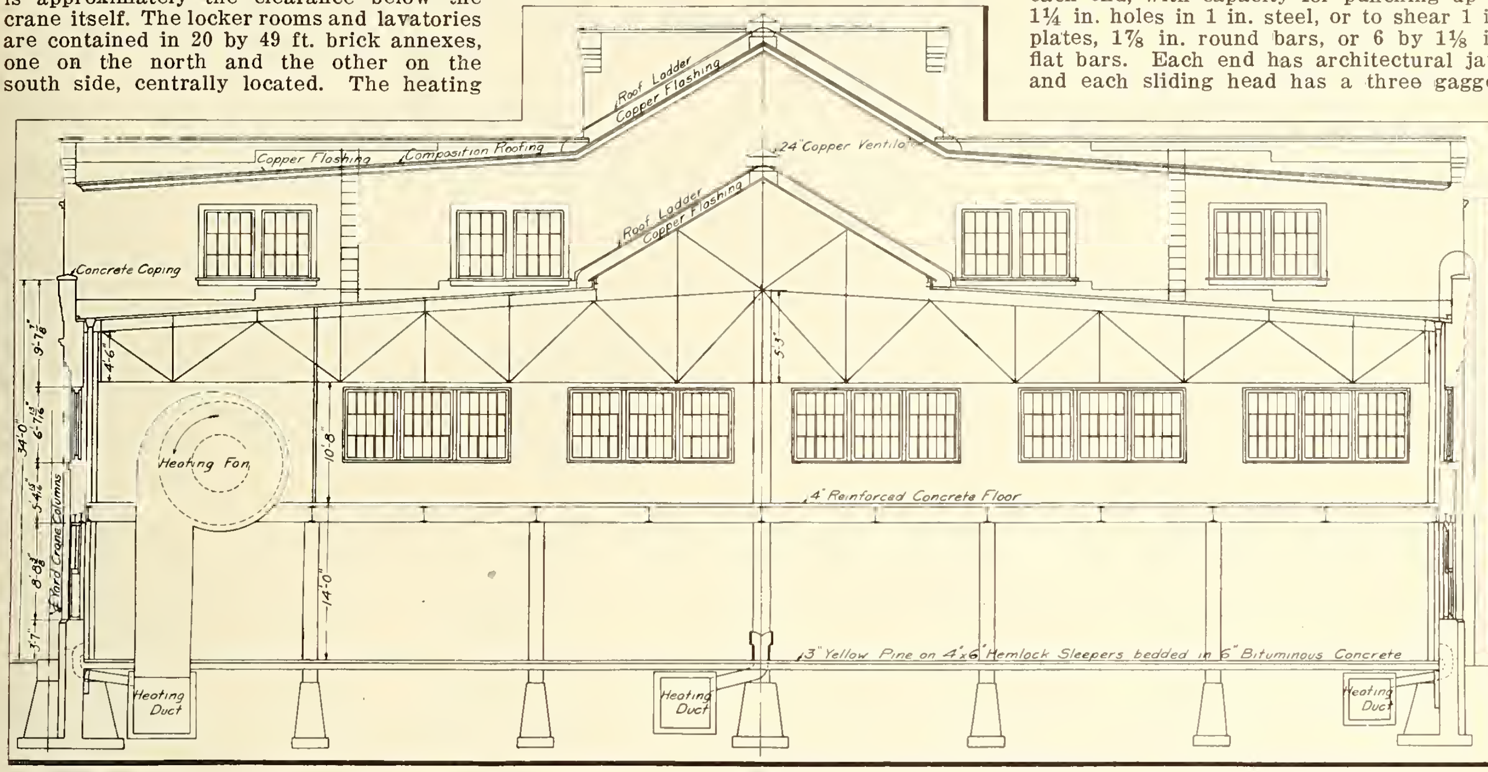


Fig. 3. Cross Section of One of the Passenger Car Buildings, looking towards High End.

plants are contained in two 22 by 25 ft. annexes on the north side, 60 ft. from each end. In each of these annexes, there is a 16 ft. fan, connecting with a concrete duct across the shop under the floor, with similar ducts branching off along the side walls, and along the row of columns, with outlet heads at each column.

The northerly and central bays contain three working tracks each, at 21 ft. centres, extending through the shop, and between

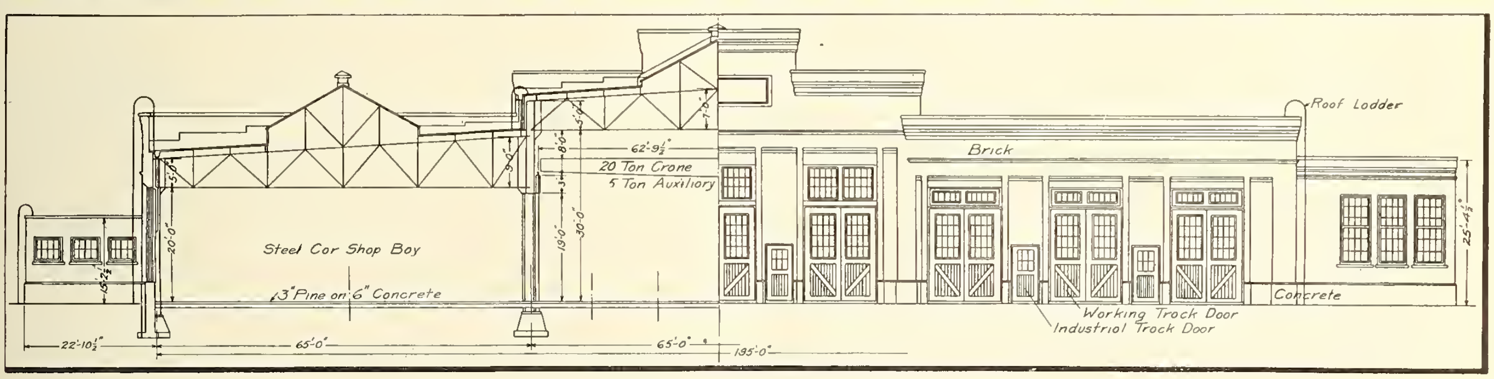


Fig. 5. Cross Section and End Elevation of Freight Car Shop.

these tracks in each bay, there is a 2 ft. gauge service track, with cross connections at nearly equidistant intervals along the shop length. The working track doors are 12¾ ft. wide, and the service track doors, 5 ft. The working tracks are laid on 7 by 8 in. by 8 ft. sleepers, and the service tracks, on 4 by 6 in. by 4 ft. sleepers. The flooring is of 3 in. yellow pine, on 4 by 6 in. hemlock sleepers, which, in common with the rail sleepers, are bedded in a 6 in. base of bituminous concrete.

The southerly bay is for the steel car shop layout, containing a full equipment of machinery for the handling of repairs to this rapidly increasing type of rolling stock. From the west end, there are three entrance tracks as in the other bays, the central one of which extends through the shop, the outer ones cutting off at 125 ft. through the first five sections of the shop. On each side of the through track is located the machine equipment, which it will be observed is arranged in such a manner that the material on entering from the east end of the shop, passes in a natural path along a sequence of machines, depending on the particular member being fabricated, reaching the other end of the shop completely machined and ready for fitting to the car under repair. The two stub end tracks at the west end, will each hold three cars, giving a normal steel car shop capacity of 6 cars, but it is obvious that the nearby tracks of the other two bays are quite accessible for steel car work. The tendency in modern rolling stock construction appears to be to get away from wooden construction, so that it is not too visionary to forcast the day, after the present stock of wooden equipment has been scrapped, when nothing but steel equipment will be in use. This shop has been laid out with that day in view, as while it meets all present requirements admirably, it at the same time is capable of expansion to the full size of the shop.

The shop equipment is as follows:

S1 Double angle shear, with shearing capacity up to 6 by 6 by 1 in. angles either square off or at an angle. Knives rectangular with four cutting edges. Mounted on a 6 ft. diameter turntable. Motor driven.

S2 Double end punch, 24 in. throat on each end, with capacity for punching up to 1¼ in. holes in 1 in. steel, or to shear 1 in. plates, 1⅞ in. round bars, or 6 by 1⅛ in. flat bars. Each end has architectural jaw, and each sliding head has a three gagged punching attachment. Motor driven.

S3 Combination high speed cutting off saw, for structural shapes such as I beams, T and girder rails, and round and square stock. The table is so arranged as to facilitate the mitring of beams, etc. Equipped with two saws. Motor driven.

S4 Gate shear, 120 in. between housings, with capacity up to 1 in. plates. Housing throat depth of 25 ins. 134½ in. knives, with four cutting edges. Counterbalanced head, controlled by automatic stop. 90 in. flywheel. Total machine weight about 136,000 lbs. Motor driven.

S5 Horizontal Punch. 36 in. throat, with capacity for ⅞ in. holes in ⅞ in. stock, with 3 gag punching attachment. Equipped with 40 ft. overhead runway, extending 20 ft. in either direction, and provided with two hand operated hoists. Motor driven.

S6 Plate planer. Capacity of ⅛ in. feed on ¾ in. plate at 40 ft. per min. 32 ft. cut at one setting, pneumatic clamps, holding up to 1 in. plate. Cuts in both directions.

Overhanging housings to permit of planing plate edges in successive settings. Motor driven.

S7 Plate straightening rolls. Capacity $\frac{5}{8}$ in. plates. Distance between housings, 4 ft. 2 ins. Six 10 in. rolls arranged in two tiers, equal number above and below. Independent vertical and horizontal hand adjustment. One upper roll central with bottom roll, with others intermediate. Lower rolls at $10\frac{1}{2}$ in. centres. Motor driven.

S8 Horizontal punch. 24 in. throat, with capacity for 1 in. hole in 1 in. stock, and having 3 gag punching attachment. Similar runway to that with S5. Motor driven.

S9 Structural steel punch. Capacity for 1 in. holes in 1 in. steel Maximum c. to c. distance of outside punches is 38 ins., with depth of throat to centre of cast steel sliding head, 24 ins. Beam coping attachment so arranged that a beam coped at one end can be passed through without turning beam in the shop. Fitted with 8 complete gagged punching attachments. Main frame of partial steel. Spacing table arranged to handle beams from 10 to 20 ins. for both flange and web punching, and for 24 in. plates. Equipped with adjustable rollers for supporting beams and plates, and with guide rollers on the punching fixtures to align the work. Carriage moved by hand carrying a pawl which drops into a notched strip along side of bed. Table length suitable for 40 ft. carriage travel. Weight about 64,000 lbs. Motor driven.

S10 Double end punch and shear. 18 in. throat on each side, and with a capacity to punch 3 in. hole in 2 in. steel, or shear 10 by $2\frac{1}{2}$ in. bars, or $4\frac{1}{2}$ in. rounds. Main frame partial steel. 5 in. stroke. Weight about 100,000 lbs. Motor driven.

S11 Plate bending rolls. Capacity for bending 10 ft. width of 5-16 in. plate. Pyramid arrangement of rolls, upper one 8 ins., and lower ones 6 ins. Top roll with solid extension for balancing, and back housing hinged for removal of plates rolled to complete circles. Lower rolls $7\frac{3}{4}$ ins. c. to c. Motor driven.

S12 Horizontal bending and straightening machine. For 15 in. I beams and channels, either way. Jaw, $51\frac{1}{2}$ ins. wide, 26 ins. deep, and $16\frac{1}{2}$ ins. high. Weight about 30,000 lbs. Bending ram to operate continuously when in use, and fed up to the work by a heavy screw and revolving nut, with a total adjustment of $4\frac{1}{2}$ ins. Main frame of steel. Motor driven.

S13. Rivetting machine. 72 in. reach, 18 in. gap, and capacity of 1 in. rivets with 80 lb. air. Equipped with four overhead electric hoists, each with capacity for 5,000 lbs., on a runway over centre line of pit. Runway is 160 ft. long, and bracketed to columns to give a clearance of 10 ft. for the hook in its highest position. 100 ft. pit.

S14 Metal cutting band saw. 36 in. wheels. Motor driven.

S15 Eight spindle arch bar drill. 10 ft. long. Three step cone drive geared 1 to 4. Motor driven.

S16 Double end punch and coping machine. Capacity for punching $1\frac{1}{4}$ in. holes in 1 in. steel, and for shearing 1 in. plates, $1\frac{7}{8}$ in. round bars, 6 by $1\frac{1}{8}$ in. flat bars, and 4 by 4 by $\frac{3}{8}$ in. angle bars. Throat, 25 ins. Motor driven.

S17 Bulldozer. Crosshead face, $89\frac{1}{2}$ by 16 in., with 24 in. stroke. Die space with crosshead forward, 44 ins. Motor driven.

S18 Bulldozer. Crosshead face, 63 by 12 ins., with 20 in. stroke. Die space, 38 ins. Motor driven.

S19 Rapid action punch. Capacity for $\frac{7}{8}$ in. holes in $\frac{5}{8}$ in. steel at rate of 65 strokes per min. Throat, 16 ins. Motor driven.

S20 Draw bench. 50 ft. long, with pulling capacity of 10 tons. Motor driven.

S21 4 ft. radial drill. High speed type. Capacity, 1 in. hole, 8 ft. $1\frac{1}{2}$ in. drill radius, and greatest height from base to nose of spindle, 4 ft. $10\frac{1}{2}$ ins. Spindle traverse, 15 ins., and head traverse, 3 ft. $4\frac{1}{4}$ ins. Motor driven.

S22 Double emery grinder. 24 in. wheel, 3 in. face. Motor driven.

S26 Two stationary rivet furnaces. Oil fuel.

S29 Air compressor. Capacity, 1,000 cu. ft., at 110 lbs. pressure. Two cranks, two stage, double acting, motor driven.

S30 Double furnace. 8 ft. wide by 6 ft. deep by $2\frac{1}{2}$ ft. high per chamber.

S31 Double furnace. 9 ft. wide by 3 ft. high by 12 ft. deep per chamber.

In addition to the foregoing stationary equipment, there are other machines in the shop as follows:

Pipe bending machine complete.

Oxygen welding outfit, complete with tanks, 3 welding torches, 1 cutting torch, 8 welding tips, reducing valves and pressure gauges for oxygen or blaugas. Four 50 ft. lengths of hose for the torches.

Six portable rivet furnaces, complete with oil burners, oil reservoir, fan, and flexible compressed air connection. Mounted on wheels.

Triplex 3 by 8 in. hydraulic pump, with capacity of 35 gallons a minute against 1,500 lbs. pressure. Motor driven.

Thus, the parts enter the shop from the east, the sills and large plates, etc., passing along through the plate planer and beam punch, etc., to the rivetter, while the smaller parts pass down on the other side through the punches and shears, etc., to the rivetter. Forgings are made alongside, and such parts as can be so handled, are here assembled, before final assembling on the car. The cold working machinery is in the early part of the path, then the hot working machinery, and then the final assembly of the parts on the car. The routing is excellent, with no retrograde steps.

Along the south wall of the freight car shop, extending from the midway to the lavatory annex near the centre of the building, there is a storage platform, 288 by 21 ft. on the level of the ground. Centrally down this platform, there is a 2 ft. service track, with two turntable connections into the building, as well as connections at the front end of the platform. This platform is surfaced with 3 in. planking.

Along the outside of the platform, there is also a light shed on the platform, 170 by 8 ft., with a height in front of 8 ft., sloping to the rear to 7 ft. This shed contains storage bins for the freight car shop.

There is a similar platform along the north side from the fan annex to the midway, with service track midway down its length, with connections into the building. The platform has a 50 ft. long stock bin shed.

This article will be continued in our next issue.

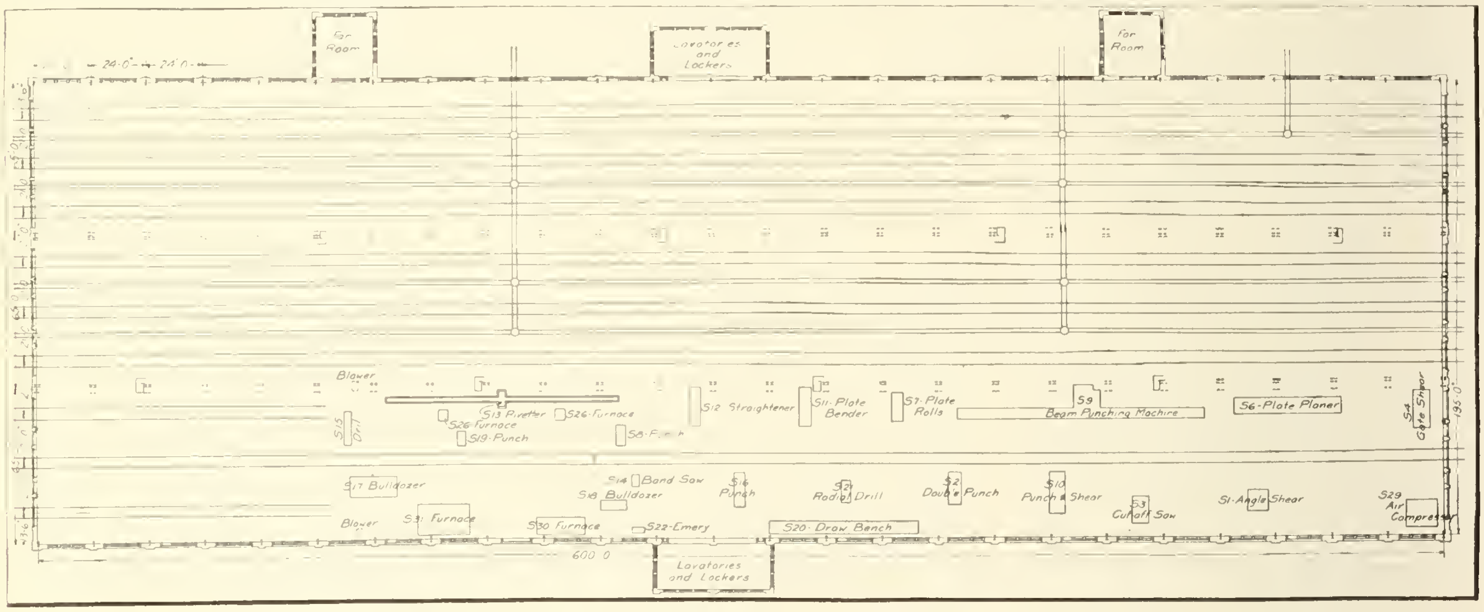
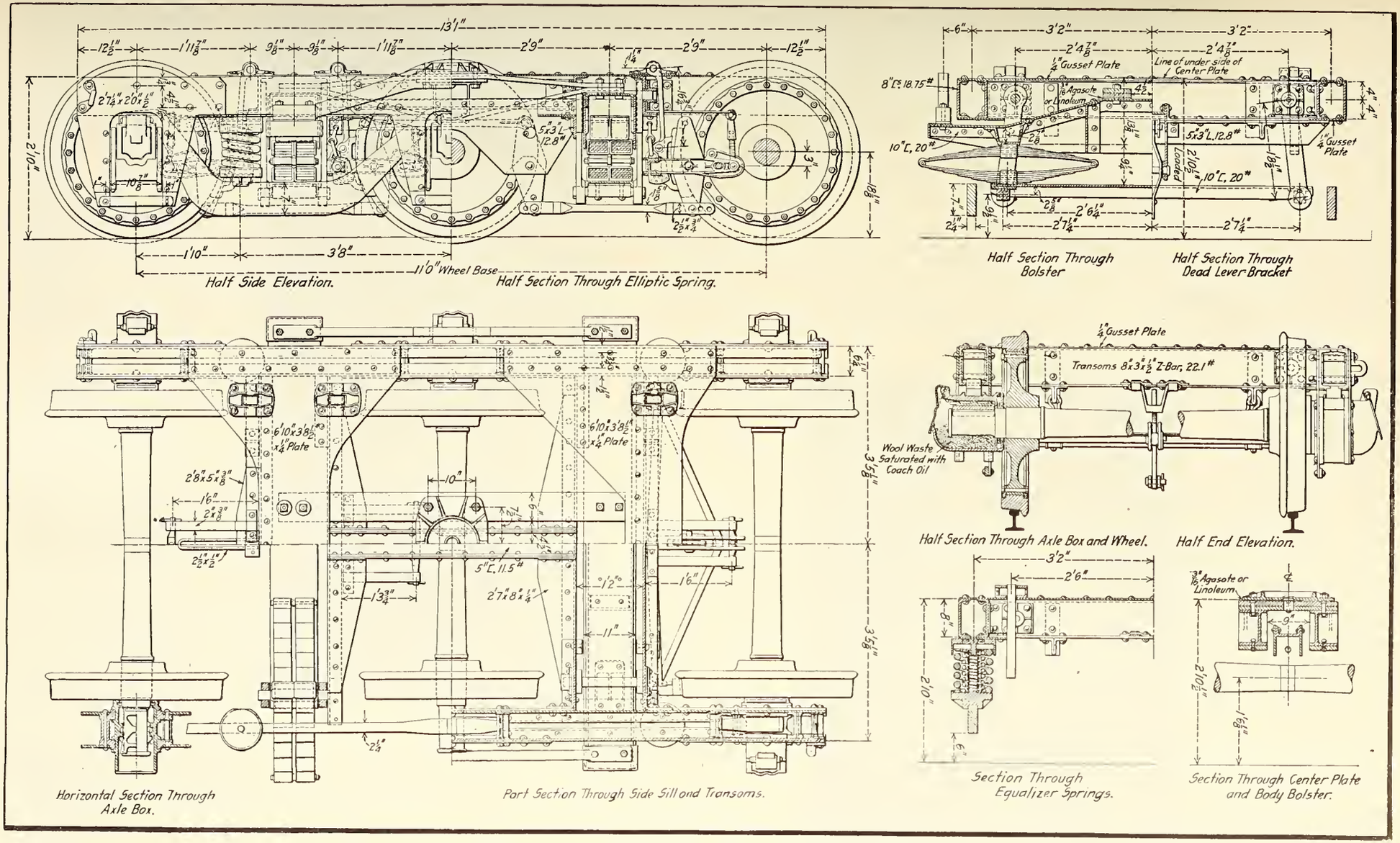


Fig. 4. Plan of Freight Car Shop, showing Machine Tool Layout in the Steel Car Shop Section.

Hardwood Ties on Panama Rd.—The use of ties of lignum-vitae (guayacum recina) is a notable feature of the track construction of the Panama Rd., and the ties have given remarkably long service, those of good quality lasting for about 30 years under the tropical conditions on this road, even though unprotected by tie plates. The best quality of this timber is no longer available, however, as it is so valuable for use in connection with machinery and manufacture that it is not to be had at suitable prices for railway ties. Owing to its durability, the renewals on this 50 mile railway ranged from 4,000 to 10,000 a year (1880-1895) or 80 to 200 per mile, with an average of 7,000 or 140 per mile.



General Arrangement of C.P.R. All Steel Six Wheel Truck for Passenger Cars.

Canadian Pacific Railway's All Steel Trucks for Passenger Cars.

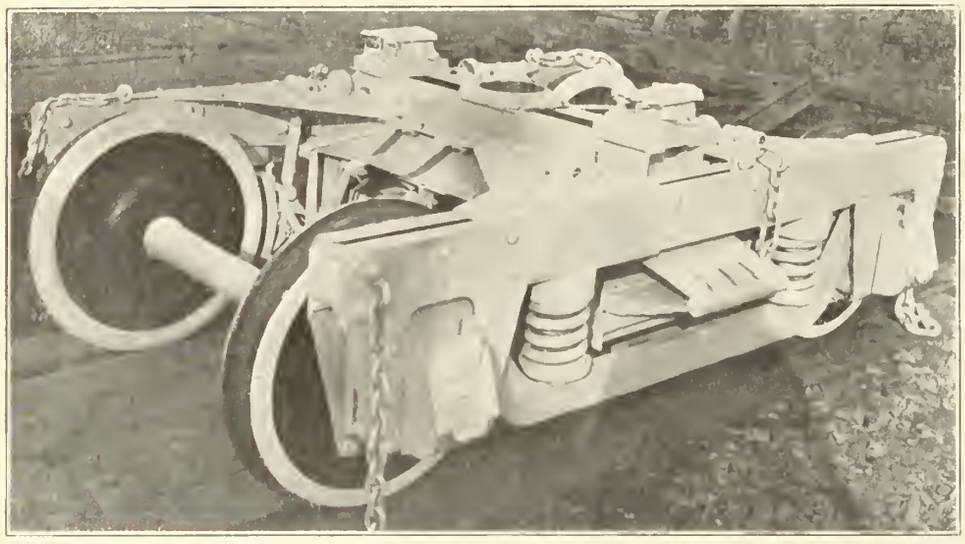
Within the past few years, a number of railways have adopted all steel trucks for service under heavy passenger train equipment. The C.P.R. has in use a type of four and six wheel steel truck that was designed by the General Master Car Builder, R. W. Burnett. The general appearance of the two trucks is clearly shown by the accompanying illustrations from photographs, and the details of the construction of the six wheel truck are illustrated by the line engraving.

One of the points about the truck that at once attracts attention is the smooth straight line external appearance, with omission of the usual end pieces. The absence of these pieces gives a better clearance for the car steps, and allows a better opportunity not only to strengthen the draft rigging, but to inspect and maintain it. On the end towards the centre of the car, there is a better opportunity to install the axle light apparatus.

The side beams consist of two 8 in. channels, with their channels towards each other. They are rivetted together with spacing blocks between, so that they present a smooth surface on the outside. The two beams thus formed are tied together by Z bar transome, and straight gusset plates extending all the way across the truck of both the top and bottom of the channels. At the pedestals, the lower flanges of the channels are cut away to admit the equalizers, and are, at the same time, stiffened by the pedestal plates. These are made of flat plates, which are first punched approximately to shape, and then milled to the exact size. In designing the truck, it was expected that these pedestals would bend in case of a derailment, but that they could easily be bent back into shape. Experience, however, has shown that whenever a derailment has occurred, the pedestals have not been distorted, and it has been possible to carry the car body to

the shops on its own trucks.

For wearing strips, chilled cast iron liners are rivetted to the jaws, and these have shown wearing qualities superior to anything else that has been tried. Neither liner nor box has shown any appreciable wear, and the indications are that both will run indefinitely. At the bottom, the jaws are tied together by a short pedestal tie bar, held in place by a pin, fitted with cotters and without bolts or nuts. To remove a pair of wheels, all that is required is to take out two cotters for each pair of wheels, pull



C.P.R. All Steel Four Wheel Truck for Passenger Cars.

out the pins and lift the frame.

The absence of the end pieces necessitated the use of inside hung brake beams, and these are installed without any retracting springs, but with a special brake beam adjuster. This is very clearly shown in the half tone illustrations. It consists of a hanger carried by arms rivetted to the transom. Into the bottom of this hanger is screwed the carrier that supports the truss of the brake beam. No check nut or cotter is required to hold it in place, as it cannot turn, and the adjustment is effected by removing the pin from the brake beam, screwing the carrier to the proper position, and replacing it in the beam.

Bolts and nuts are avoided, and one of the arrangements for doing this is to be found in the bracket for the spring plank hangers. It will be seen that these are on top of the gusset plates. They are simple castings, with a seat for the lower pin. The pin is held in place by a wall over the hole at one end and a cotter pin put across the hole at the other end. To remove the pin, a hole is left in the wall, through which a drift can be pushed or driven.

In spite of the substantial appearance and actual strength of these trucks they are lighter than the composite trucks which they replace.—Railway Age Gazette.

Tree Snow Fences on Intercolonial Ry.—Canadian Railway and Marine World for Sept., 1913, contained an article on tree snow fences on the Western Lines C.P.R., in connection with which a Moncton, N.B., correspondent writes us that evergreen hedges have been in use on the Intercolonial Ry. for many years, especially between Newcastle and Campbellton, N.B., where some of them were set out over 20 years ago, since which others have been added on other portions of the line. Some of these hedges have grown to a height of over 20 ft., and have proved very useful, as a protection from snow and they are also ornamental.

The Proposed Change of the Toronto, Hamilton and Buffalo Railway's Route in Hamilton.

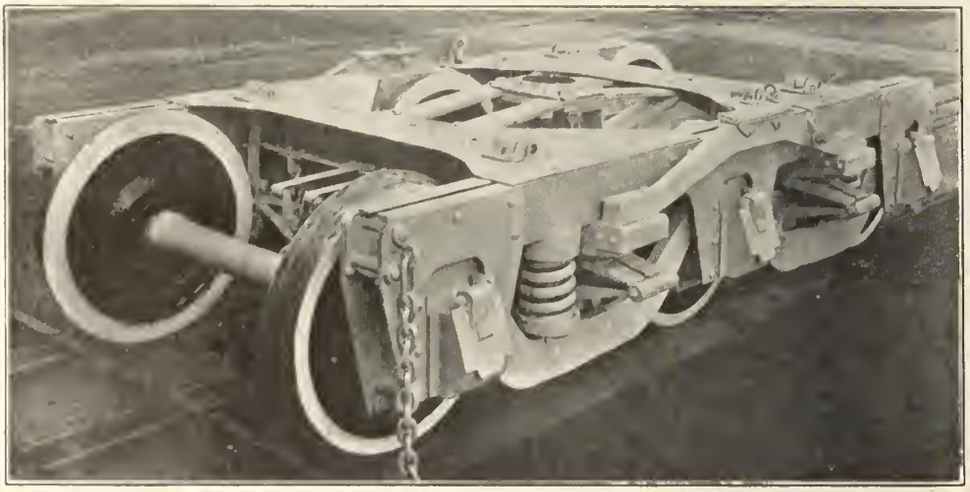
Brief mention was made in Canadian Railway and Marine World for January of the Board of Railway Commissioners' decision that it has power to consider an application for the issuing of an order to compel the T.H. & B. Ry. to abandon its present entrance into Hamilton, Ont., and adopt another route. As the question is one of great importance to railway companies generally the decision given by the Chief Commissioner, H. L. Drayton, K.C., is now given in full as follows:

This is an application made by the City of Hamilton, Ont., for an order to compel the Toronto, Hamilton & Buffalo Ry. to abandon its entrance into the city via. Hunter St., and adopt, in conjunction with the G. T. R. and the Canadian Northern Ontario Ry., a common location in the north end of the city; and that the portion of the T. H. & B. R. in the city, colored yellow on a plan submitted, be permanently diverted to the said common entrance and location, and to directing the company to construct its tracks on the new route shown on the plan as such common entrance for all railways entering the city. The original application asked that the order be issued under sec. 237 of the Railway Act, but the application was subsequently amended and the order was pressed for under secs. 26, 167, 237 and 238 of the Act. Mr. Cowan, who appeared for the municipality, also amended the application at the hearing by substituting the word "divert" for "abandon." Mr. Hellmuth, who appeared for the T. H. & B. R., made a preliminary objection by challenging the Board's jurisdiction to issue an order as applied for.

It appears that the railway as constructed in Hamilton, along Hunter St., was built under the terms of a by-law, passed by the City Council on Oct. 25, 1894, and numbered 755. It is a bonus by-law, which was passed after after an affirmative vote of the ratepayers had been taken. Under its provisions, the railway company received a bonus of $225,000, on terms which appear to have been carried out. These terms call for the construction of the line, and require that the company build and always maintain a first-class passenger station in a central part of the city, at which all passenger trains must be stopped; and, after making certain other stipulations, provide for the route on which the line was to be constructed and the manner of construction, some of the railway through the city being constructed on the level and one part through a tunnel. The whole question of the construction of the railway seems to have been carefully considered and the civic requirements of that day provided for. This bylaw was confirmed and "declared to be legal, valid, and binding, to all intents and purposes" by Ontario Statute 58 Vic. (1895) ch. 68. In the same year, the Dominion Parliament, by chap. 66, ratified the bylaw, and declared it to be valid and binding upon the parties thereto, so far as such confirmation was within the powers of Parliament.

Mr. Hellmuth takes three objections to the Board's jurisdiction to make any alteration: 1st, that the bylaw, ratified and confirmed as it is by Parliament, constitutes a special act, and therefore overrides the provisions of the general statute; 2nd, that the Board cannot authorize a relocation of an existing line, except upon the application of the railway company; and, 3rd, that the railway company could not, in law, have built its line on any other route, and that the Board cannot order the company to do that which, in law, it has no authority to do.

In so far as the first objection is concerned, in my view the question is covered by the decision of the Privy Council in C. P. R.



C.P.R. All Steel Six Wheel Truck for Passenger Cars.

vs. Toronto and G. T. R. (1911), A. C. 461. In that case, the method of protection at certain streets was by agreement fully provided for. That agreement, as the bylaw in the present case, was ratified both by Parliament and Legislature. It is true that, since the agreement was made, the scope of railway operation dealt with was enlarged, the C. P. R. having acquired an additional 26 ft. of land to the south of and enlarging its former right of way; so the special act—as the agreement had become—really did not deal with the whole of the questions considered by the Board, and consequently did not in any way interfere with the Board's jurisdiction under the provisions of the general act. The decision, however, does not proceed on any such ground, but upon the broad, general principle that the subject matters are not the same. The judgment of Lord Atkinson, who stated the reasons for their Lordships' decision in the Toronto case reads as follows: "If the subject matter of the special act and that of sec. 238 of the act of 1906, as amended, were the same, then there would undoubtedly be a conflict between the two enactments. But they are not the same. The specified works, the power to construct and use them, form the subject matter of this special act. The subject matter of sec. 238 is the control of the Board over the railway companies, and the power conferred upon it to require the companies to construct such works as it may deem necessary for the protection and convenience of the public. These are wholly different matters. The two statutes can stand together. Effect can be given to each. There is no conflict between their provisions as contemplated by sec. 3."

As in the Toronto case, the company proceeded under the special act,—built its line and supplied its station and facilities. In my view, however, the enabling special act does not in effect provide that the company's work or appliances shall never be altered or changed, no matter how surrounding circumstances and conditions may change, or however inadequate and faulty the facilities so supplied may become.

A distinction, of course, exists between this and the Toronto case, in that it cannot fairly be said that the change here is necessary in order to protect the public in the use of highway crossings over the existing railway. The railway company has already filed plans for an overhead structure along Hunter St., the effect of which would be to eliminate highway crossings now more or less dangerous; but the subject matter of the bylaw and the validating legislation not being the question of the Board's jurisdiction or the limitation of that jurisdiction, should the act, under any other section, give jurisdiction to the Board to make an order as applied for, it seems to me that the cases are parallel.

In the Toronto case, the particular subject of consideration, in so far as this question is concerned, was the fact that the special act provided specifically for a certain measure of highway protection leaving the railway on the level—the jurisdiction of the Board to nevertheless elevate the railway for the protection of those using the highway was sustained. In this case, the special act undoubtedly fixes the railway location, an object, however, as much removed from the general question of the Board's control over the railway as that of the protection of the Toronto crossings could be said to be.

I should also point out that sec. 8 of the Dominion statute validating the agreement (58-59 Vic., ch. 66), specially provides that nothing in the act contained should affect any rights or powers conferred by the Railway Act on the Railway Committee of the Privy Council. This provision would seem to indicate the intention to continue public control of the railway through the agency then used for such progress—the Railway Committee of the Privy Council—to which the Board may be said to be the statutory successor (sec. 11 of the Railway Act).

Dealing with the second objection, sec. 167 provides—"If any deviation, change, or alteration is required by the company to be made in the railway, or any portion thereof as already constructed, a plan of the portion of such railway proposed to be changed, showing the deviation, change, or alteration proposed to be made shall be submitted for the approval of the Board, and may be sanctioned by the Board."

Under sub-sec. 2, the plan of the portion of the railway proposed to be changed, if sanctioned, will be dealt with in the manner that the act provides for the original plan; and, under sub-sec. 3, the company may then make the deviation, change, or alteration, and all provisions of the act will apply to such portion of the line in the same manner as they applied to the original line.

In dealing with the approval of location plans, the Board, while bound by the general location as approved by the Minister, may, unless the Minister otherwise specifically directs, sanction a deviation of not more than one mile from any one point on the location approved by the Minister (sec. 159, sub-sec. 3 Railway Act). The approval of the Board must be obtained before construction takes place.

Under sec. 26, sub-sec. 2, "The Board may order and require any company to do forthwith any act, matter, or thing which such company is or may be required or authorized to do under this act."

Sec. 28 also provides that "the Board may, of its own motion, inquire into, hear, and determine any matter or thing which, under this act, it may inquire into, hear, and determine upon application or complaint, and with respect thereto shall have the same powers as, upon any application or complaint, are vested in it by this act."

Sub-sec. 2 further provides that the Board's powers may be exercised from time to time, or at any time as the occasion may require. Sec. 29 provides that the Board may review, rescind, change, alter, or vary any order or decision made by it, while sec. 32 (2) gives the Board like powers in regard to regulations and orders made by the Railway Committee of the Privy Council.

I have had much difficulty in arriving at a conclusion as to the proper effect to be given to sections 26 and 28. It seems to be clear that, as a result of the provisions of sec. 28, the Board, of its own motion, may determine any question it would have a jurisdiction to determine on application or complaint. This section, however, of itself does not enlarge that jurisdiction which the Board would otherwise have after an application or a complaint was made to it.

Looking at the sections dealing with the locations of lines themselves, it might be said that the duty was thrown upon the company of submitting its location plans; that location questions were matters relating to the policy and business venture of the company and were directly dependent upon financial considerations. Hitherto, the Board's jurisdiction does not seem to have been exercised in compelling the company to file location plans, or in compelling the company to construct its railway by a specified time. It seems to have been taken for granted that the company was bound by the provisions of the act as to when the work of construction should be commenced and as to when it should be finished, and that the Board's duty was to see that location plans, if filed, were proper, and work, if constructed, was sufficient and safe.

The Board's jurisdiction in dealing with a deviation is similar to that the Board exercises in dealing with the general location plan; and the fact that the Board's province as indicated by the appropriate section in each case is that of sanctioning instead of ordering is probably the reason why no application in the past seems to have been pressed for an order requiring either original railway construction or deviation in the supposed interests of any particular parties.

It must further be borne in mind that, so far as branch line construction required for industrial purposes is concerned, the Board's power is not confined to a mere sanctioning of the proposition by the railway; but the Board may order the construction of branch lines for industrial purposes under the provisions of sec. 226 of the act.

The language of the act differs in dealing with duties of the company to the public, on the one hand, and rights of the company which it may or may not exercise, on the other. For example: Signboards at highway crossings shall be erected and maintained (sec. 243); farm crossings shall be provided (sec. 252); modern and sufficient apparatus shall be provided and be used on all trains (sec. 264); on approaching highway crossings, the whistle shall be sounded and the bell shall be rung (sec. 274); and, under sec. 284, the company shall furnish adequate and suitable accommodation.

On the other hand, questions not related to the protection of the public either using the highways or the trains, and not concerned with the proper demands of traffic, but rather related to the management of the company itself, or the manner in which the statutory powers of the company may be exercised, seem to be dealt with in a different manner. For example: The company may make bylaws for "the appointment of all officers, servants, and artificers, and the prescribing of their respective duties and compensation to be made therefor" (sec. 121, ss. b). The company, again may exercise the general powers for the purposes of the undertaking contained in sec. 151 of the act, and which includes, under ss. (f), the construction and operation of the railway, and under ss. (p), the right, from time to time, to alter, repair, or discontinue it, and substitute another in its stead, as well as a general power which it may exercise to do all acts not enumerated necessary for the construction, maintenance, and operation of the railway, ss. (q). In like manner, under sec. 176, the company may take possession of the lands of other companies, subject, of course, to the Board's approval being first obtained. It is not necessary to multiply further instances for the purposes of showing an apparent distinction in the position of companies under certain sections of the Act.

In order to find a jurisdiction in this case, it seems to me that it is necessary to rely upon sections 26 (ss. 2), and sec. 28, and to treat said sections as applicable, notwithstanding any implication which might otherwise arise by reason of the different manner in which obligations, on the one side, and rights of the company, on the other, are treated. Apart from such sections, the Board's jurisdiction, in a case of a deviation, is to sanction and not to order. Under an analogous section, 261, the late Chief Commissioner held that the Board cannot open a road for traffic against the desires of the company or without its making an application for an order for such

opening (Central Saskatchewan Board of Trade v. G. T. P. R. Co., 10 C. R. C. 135; British Columbia and Alberta Municipalities v. G. T. P. R. Co., 13 C. R. C. 463).

The question seems to me, however, to have been dealt with so as to affirm the Board's jurisdiction, by the decision of the Supreme Court in the case of G. T. R. vs. Department of Agriculture of Ontario, 425 S. C. R. 557. This was a case where the Board's jurisdiction to order a railway company, whose line had been completed and in operation, to provide a station at a point where, in the Board's opinion, it was required to afford proper accommodation for traffic, was challenged. The objections to the Board's jurisdiction were similar to those now in question, and the effect, among other sections, of sections 26, 28, and 167, was considered. The Chief Justice specifically found that sec. 28, par. 1 and ss. 2, gives the Board full jurisdiction, of its own motion, to order and require any company to do anything which such company is or may be required or authorized to do under the Act, in so far as it is not inconsistent with the Act. Mr. Justice Girouard found that the Board had a jurisdiction, under sec. 28, as well as other sections which are not relied on by the parties to this issue; while Mr. Justice Anglin found that the Board, being empowered to authorize the company to erect stations at new or additional points, and being clothed by sec. 26 (2), with authority to order and require the company to do that which it may be authorized to do, has jurisdiction to order and require the erection of a station at a new and additional stopping place upon a railway already constructed. The Board here is empowered to authorize a deviation, and, following the decision of the Supreme Court, having the right to authorize it also has the jurisdiction to order the company to deviate its line.

The application in question is in effect a deviation. The city asks that the Board direct the company to eliminate the portion of its line lying between Locke St. and Baillie St., some 5,400 ft., and substitute therefor certain tracks to be laid on the G. T. R. property to the north, providing the necessary deviations to the G. T. R. property, so as to permit the use of the tracks to be laid on the G. T. R. property as part of the T. H. & B. R. line.

The main object of the application is to divert the line from Hunter St. to the G. T. R. right of way. This is within the limit of one mile from the original location. Mr. MacMurchy has filed a supplementary argument for the railway showing that certain portions of the deviation would lie outside the mile limit. This may be so, but the approaches can probably be rearranged so as to leave the whole of the deviation within the limit. A mere change of detail would apparently meet this objection without much injury to the general scheme of improvement prepared by the city.

There remains to be considered Mr. Hellmuth's third objection, namely, that the railway company could not, in law, have built its line on any other route, and that the Board cannot order the company to do that which, in law, it has no authority to do. Regarding any arrangements between the city and the company, I am of the opinion that, in the public interest and safety, the Board may, on fair and proper terms, disregard any contract, agreement, or arrangement that the city and the company may have made. If the only parties to the issue in the question were the city on the one side, and the company on the other, the position undoubtedly would be very different. The city would be bound by its bylaw; but it is quite clear that, apart from the bylaw, the company, in the first instance, could have built just where the Minister of Railways located the line, subject to the approval of the necessary details by the Railway Committee of the Privy Council at the time the railway was constructed.

If, then, the powers of the Board are not overridden by the bylaw and special act, and a jurisdiction is obtained under sections 26 and 28, I am of the view that, while the company, of its own motion and apart from that municipal consent which the present application entails, cannot abandon its present route, being bound as it is by the terms of the municipal bylaw; the Board may, nevertheless, make such an order for its deviation as it may decide that the public interest and safety demands.

No question on the merits is herein considered, one way or the other. On the one hand, it may be that the city's proposals for the diversion will prove to be reasonable and in the best interests of the public, and, perhaps, of the railway itself. On the other hand, it may be that the said proposals are entirely unreasonable, and that the application should be refused. The questions of railway operation and public convenience involved are intricate, and will take some time to determine; and a proper, final solution of the problem will require the expenditure of much time and study.

On the question of jurisdiction, the company has, of course, the right of appeal to the Supreme Court; and it has expressed its desire to exercise such right, if the Board's decision on the question should be adverse to it. If the company still desires to take the appeal, without first going into the merits, it will please so advise the Board within the next ten days, and without delay proceed to perfect its appeal.

[We are officially advised that the T. H. & B. R. Co. has entered an appeal quashing the Board's jurisdiction.]

Painting Boards at Canadian Pacific Ry. Montreal Shops.

Except for repair work, the hand brush is no longer seen in the best railway practice, the older method having been superseded by dipping, or air brush painting. Both these processes are in use in the C.P.R. Montreal car shops, where as mentioned in a description in these columns of the process of manufacture of a wooden box car, the whole of the outside of the car is painted by the use of the air brush, a special shop being reserved for the purpose. Three applications are given, with a short drying interval between.

In the new steel frame box cars which the company is now building almost exclusively, where the sheathing is secured in the car sides horizontally, it has been found advisable to first have the sheathing painted, in order that the mating strip may be protected from decay should water leak into the joint, where the horizontal crevices tend to retain whatever soaks in.

Instead of painting by hand, or using the air brush, dipping in a large tank, of ample size to hold a number of pieces, is used. The trouble with the dipping process has been that unless some special provision has been made for allowing the boards to drain back into the tank, there is a great waste of paint. The method adopted in these shops is to pass the dipped board as it comes from the tank, through between coarse brushes, projecting inwards from four sides to form a rectangle the shape of the board, these brushes squeezing the surplus paint from the planks without any additional draining.

Progress of Steam Railway Electrification.

This year will see marked steps in the development of railway electrification in Canada. As previously stated in these columns the C.P.R. has let a contract for the electrification of its Rossland Branch in British Columbia; the City of London will electrify its line between London and Port Stanley, Ont., and the Canadian Northern Ry.'s Montreal tunnel and yards, now under construction, will be electrically equipped.

In the United States the Chicago, Milwaukee and Puget Sound Ry. is electrifying 450 miles of its main line between Harlowtown, Montana, and Avery, Idaho. The Norfolk and Western Rd. is electrifying the Bluefield Vivian section, 85 miles, over which 65 thousand tons of coal are handled daily. The Pennsylvania Rd. will extend its electrified zone from New York to Elizabeth, and this is probably but a step toward electrification all the way from New York to Philadelphia.

Recently a commission appointed in Victoria, Australia, to determine the best system for suburban railways, covering about 300 miles of steam and railroad tracks, reported that the direct current system shows a material advantage over single phase alternating in first cost and also in the annual cost of operation.

Switzerland Refuses to Adopt the 24-Hr. System.

A Berne cablegram says:—The Swiss Government has refused to sanction a request from the Federal railways for the introduction of the 24 hour system of time reckoning. It did so on the ground that, although France and Italy now have this system, Germany and Austria have not, so that, instead of Switzerland having, as at present, difficulties on her French and Italian frontiers, she would have them on her German and Austrian frontiers instead. The Swiss Post and Telegraph Department was not averse to the reform, neither was the Customs Department; the cantons in general did not disapprove of it, while the clock and watchmakers supported it heartily.

J. E. Morazain, Assistant Superintendent Montreal Terminals, C.P.R., writes: "I wish you and your valuable and welcome journal, Canadian Railway and Marine World, a happy and prosperous new year."

Two motor cars (a saloon car and a composite car for the suite and attendants), each equipped with a benzol electric set, have recently been supplied to serve as a state train for the Khedive of Egypt. The system of driving adopted differs from previous forms in the fact that each of the cars is equipped with a combustion engine, dynamo and electric motors, and the train can be controlled from either of the drivers' compartments at each end.

The increasing of car loads as a means of relieving periodical car congestions has been tried by a large U.S. corporation, with the result that the average car loading was increased from 34.6 to 36.2 tons, or an increase of 1.6 ton. With this increased loading, this one corporation required 76,105 fewer cars last year than the previous year as a direct result.

A suggestion has been made in London, Eng., to the effect that the time has arrived when the services rendered by the wireless telegraph, in connection with recent marine disasters, should be fittingly recognized by granting G. Marconi some token of gratitude for his great achievements on behalf of humanity.

Canadian Railway Rolling Stock Orders in 1913.

Following are lists of passenger cars, freight cars, and locomotives, ordered during 1913, by the various railway companies, contractors and industrial companies in Canada, including such companies operating in the U. S. as are controlled by Canadian companies:

Passenger Cars

Purchaser	No.		Kind	Builder
Algoma Central and Hudson Bay	fy	1	Baggage and express	Canadian Car & Fdy Co.
Canadian Northern Ont.	fy	25	First class	Hotchkiss Blue and Co.
	fy	3	Combination	" "
	fw	1	Store	" "
	fw	3	Express	" "
Canadian Northern	fy	25	First class	Canadian Car & Fdy Co.
	fy	25	Second class	Crossen Car Co.
	fw	11	Passenger and baggage	Preston Car & Coach Co.
	fw	10	Baggage	Canadian Car & Fdy Co.
	fx	6	Sleeping	Barney & Smith Co.
Canadian Pacific	fy	3	First class	American Car & Fdy. Co.
	fy	1	Second class	" "
	fy	1	Baggage	" "
	fx	2	Buffet-parlor	Angus Shops
	a	25	Passenger and smoking	"
	ay	30	Colonist	"
	ay	12	Baggage and express	"
	fy	10	Horse express	"
Central Ontario	fw	2	Combination	Hotchkiss, Blue & Co.
Central Vermont	ax	2	Mail	American Car & Fdy Co.
Grand Trunk	bc	10	Baggage	National Steel Car Co.
	a	5	Mail	American Car & Fdy Co.
Intercolonial	bxy	3	Sleeping	Pullman Co.
	bxy	2	Dining	"
	fy	2	Mail	Canadian Car & Fdy Co.
	fy	5	Colonist	" "
	fy	4	First class and baggage	" "
	dy	8	First class	Preston Car & Coach Co.
	dw	3	Baggage	" "
Pacific Great Eastern		2	Gas-electric	Hall-Scott Co.
Quebec and Lake St. John	fw	4	First class	Hotchkiss, Blue & Co.
	fw	4	Second class	" "
	fw	4	Combination	" "
	fy	2	Sleeping	" "
Quebec Central	fw	2	Passenger and baggage	Own shops
	fx	2	Coaches	"
Superior Rolling Stock Co.	f	1	Baggage and express	Canadian Car & Fdy Co.
Timiskaming & Northern Ontario	ax	3	First class	Pullman Co.
	ax	2	Second Class	"
	ax	3	Passenger and smoking	"
	ax	3	Baggage and mail	"
	ax	2	Baggage and express	"

Freight Cars

Purchaser	No.		Kind	Capacity	Builder
Algoma Steel Corp.	a	19	Dump	100,000	Hart-Otis Car Co.
	b	19	Flat	100,000	Canadian Car & Fdy Co.
Canadian Copper Co.	a	25	Otis dump	100,000	Hart-Otis Car Co.
Canadian Northern	fm	75	Caboose	.....	Winnipeg Shops
	fm	50	Caboose	.....	Mount Vernon Car Co.
	am	75	Ore	80,000	Canadian Car & Fdy Co.
	fm	593	Box	60,000	National Steel Car Co.
	fm	1300	Box	60,000	Canadian Car & Fdy Co.
	fm	500	Box	60,000	Nova Scotia Car Works
	fm	300	Ballast	60,000	Hart-Otis Car Co.
	fm	150	Stock	60,000	Crossen Car Co.
	fm	500	Flat	60,000	" "
	bm	200	Flat	80,000	National Steel Car Co.
	fm	2	Snow ploughs	.....	Canadian Car & Fdy Co.
Canadian Northern Ont.	fm	15	Refrigerator	60,000	Mount Vernon Car Co.
Canadian Pacific	am	6	Pit	150,000	Canadian Car & Fdy Co.
	bcm	1000	Box	80,000	" "
	fm	7	Flat	60,000	Angus Shops
	bcm	500	Box	80,000	"
	dgm	155	Stock	60,000	"
	dm	1	Refrigerator	80,000	"
	bm	228	Caboose	.....	"
	a	15	Tank	80,000	American Car & Fdy Co.
	f	12	Rodger ballast	60,000	Hart-Otis Car Co.
	bm	100	Flat	100,000	Bettendorf Co.
Canadian Steel Fdries.	d	4	Ballast	80,000	Canadian Car & Fdy Co.
	d	4	Hart convertible	80,000	Hart-Otis Car. Co.
Cape Breton Coal, Iron and Ry.	f	30	Hopper	60,000	Canadian Car & Fdy Co.
	f	5	Hopper	30,000	" "
	a	20	Hopper	80,000	" "
Dominion Coal Co.	f	25	Hopper	30,000	" "
Grand Trunk	bcm	2000	Box	80,000	" "
	bcm	2000	Box	80,000	Eastern Car Co.
	bcm	3000	Box	80,000	Western Steel & Fdy Co.
	an	1000	Gondola	100,000	Pressed Steel Car Co.
	bc	500	Stock	.....	National Steel Car Co.
		500	Flat	.....	Pressed Steel Car Co.
F. H. Hopkins & Co.	f	1	Flat	.....	Canadian Car & Fdy Co
Intercolonial	bcm	500	Box	60,000	Nova Scotia Car Works
	bcm	250	Box	60,000	Canadian Car & Fdy Co.
	fm	10	Caboose	.....	Moncton Shops
	fm	20	Box baggage	80,000	"
	fm	50	Box	60,000	"
		20	Caboose	.....	Nova Scotia Car Works
	bc	200	Box	80,000	" "
Kettle Valley	f	20	Flat	60,000	Central Locomotive & Car
	f	1	Rodger ballast	60,000	Hart-Otis Car Co.
J. D. McArthur Co.	d	100	Hart convertible	80,000	Hart-Otis Car Co.
	f	1	Rodger ballast	60,000	" "
Mineral Range	an	100	Rock	100,000	American Car & Fdy Co.
Minneapolis, St. Paul and S. S. Marie	bcn	550	Box	80,000	" "
	an	500	Ore	100,000	" "
Mond Nickel Co.	a	12	Otis dump	100,000	Hart-Otis Car Co.
Pacific Great Eastern	a	4	Tank	100,000	American Car & Fdy Co.
	bc	44	Box	.....	National Steel Car Co.
	b	67	Flat	.....	" "
Quebec Central	fm	150	Wood rack	60,000	Chicago Ref. Dis. Co.
St. Lawrence Bridge Co.	b	8	Flat	80,000	Canadian Car & Fdy Co.
Sydney and Louisburg	fm	25	Hopper	30,000	" "
Toronto, Hamilton and and Buffalo	f	1	Rodger ballast	60,000	Hart-Otis Car Co.
Windsor, Essex and Lake Shore Rapid	be	2	Box	80,000	Canadian Car & Fdy Co.
	b	4	Flat	80,000	" "

a Indicates all steel
b Indicates all steel underframe
c Indicates steel frame
d Indicates composite underframe
f Indicates all wood
g Indicates steel end frame
m Indicates spring draft gear
n Indicates friction draft year
w Indicates oil lighting
x Indicates electric lighting
y Indicates gas lighting
z Indicates acetylene lighting

Locomotives

Purchaser	No.	Cylinders	Total Weight	Type	Builder
Algoma Steel Corp.	1	21 x26	142,000	0-6-0	Baldwin Loco. Works.
B. C. Equip. Co.	1	10 x14	.....	.....	Canadian Loco. Co.
Canadian Copper Co.	1	20 x26	155,000	2-6-0	Montreal Loco. Works
Canadian Northern	6	.....	166,000	Elec.	Can. Gen. Elec. Co.
	15	19 x26	123,000	0-6-0	Canadian Loco Co.
	a4	23 x28	213,000	4-6-2	Montreal Loco Works
	a25	23 x26	188,000	2-8-0	Canadian Loco Co.
	a25	24 x32	220,000	2-8-0	Can. Allis-Chalmers
Canadian Northern Ont.	a15	22 x26	173,000	4-6-0	Montreal Loco. Works
	a2	19 x26	123,000	0-6-0	Canadian Loco. Co.
Canadian Pacific	a4	21 x28	198,000	4-6-0	Montreal Loco. Works
	a14	19 x24	138,700	4-6-0	Angus Shops
	a10	22½x28	217,000	4-6-2	"
	a35	18 x26	138,000	0-6-0	"
	a10	21 x28	194,200	0-8-0	"
	a2	22½x28	222,000	4-6-2	"
	a75	23½x32	258,000	4-6-0	Montreal Loco. Works
	a10	23½x32	225,000	2-8-0	" "
	a3	23½x32	225,000	2-8-0	Can. Allis-Chalmers
	a10	19 x24	147,500	4-6-0	Angus Shops
	4	.....	184,000	Elec.	Can. General Elec. Co.
Confederation Con. Co.	2	13 x18	.....	.....	Canadian Loco. Co.
Detroit River Tunnel	4	.....	240,000	Elec	General Electric Co.
Dominion Coal Co.	1	21 x26	179,000	2-8-0	Montreal Loco. Works
Duluth, S.S. & Atlantic	a3	21 x26	196,000	4-6-2	American Loco. Co.
	a12	21 x30	186,000	2-8-0	" "
Foley Bros., Welch & Stewart	4	17 x24	94,000	0-6-0	Davenport Loco. Co.
Grand Trunk	a50	27 x30	205,000	2-8-2	Montreal Loco Works
	a25	27 x30	272,100	2-8-2	Baldwin Loco. Works
Grant, Smith & Co.	1	17 x24	94,000	0-6-0	Davenport Loco. Co.
Intercolonial	a10	24 x32	236,000	2-8-0	Can. Allis-Chalmers
	a5	24 x32	236,000	2-8-0	Montreal Loco. Works
	a10	24 x32	236,000	2-8-0	Canadian Loco. Co.
	a4	23½x28	230,000	4-6-2	Montreal Loco. Works
	5	21 x26	150,000	Switch	Canadian Loco. Co.
	1	.....	.....	Elec.	Westinghouse-Baldwin
	5	21 x26	.....	Switch	Canadian Loco. Co.
	6	24 x32	.....	2-8-0	" "
J. D. McArthur Co.	2	19 x26	130,000	2-6-0	Montreal Loco. Works
Minneapolis, St. Paul and S.S. Marie	a4	25 x26	263,000	4-6-2	American Loco. Co.
	a6	25 x30	225,000	2-8-0	" "
Mond Nickel Co.	1	20 x26	156,000	2-6-0	Montreal Loco. Works
Morrissey, Fernie & Michel	2	20 x24	148,000	2-8-0	Baldwin Loco. Works
Quebec & Lake St. John	a22	20 x24	154,000	4-6-0	Montreal Loco. Works
Quebec Central	a4	21 x26	155,000	4-6-0	Canadian Loco. Co.
St. Lawrence Bridge Co.	1	.....	.....	.....	Montreal Loco. Works
Sydney & Louisburg	1	21 x26	178,500	2-8-0	" "
Union Carbide Co.	1	15 x24	.....	.....	Canadian Loco. Co.
P. Welch	1	19 x28	170,000	2-8-0	Montreal Loco. Works
	4	7 x12	18,500	0-4-0	Davenport Loco Co.

a Indicates superheater

Railway Age Gazette

Telephone Train Dispatching on the Intercolonial Railway.

As announced in a recent issue of Canadian Railway and Marine World a contract was let recently for the installation of telephone train dispatching equipment on the I.R.C., between Moncton and St. John, N. B., 89.4 miles, respecting which we have received the following official information:

The contract includes the construction of a metallic telephone circuit of no. 9 B. & S. gauge hard drawn copper wire, weighing 210 lbs. a mile. The dispatchers will be located at the divisional point, Moncton. Gill selectors and the latest type of telephone transmitter arms will be installed in each of the offices between Moncton and St. John so that the dispatchers may communicate with any station by telephone. In addition to this, portable telephones with line poles will be furnished for each train so that in case of emergency train crews may communicate with the dispatcher from any point of the right of way. Each office will be equipped with a test panel to enable trouble to be quickly located and cleared. The equipment furnished will be of the highest grade and largely similar to what has been in use on the C.P.R. for several years. The Hall Switch and Signal Co., which has the contract, expects to have it completed at an early date.

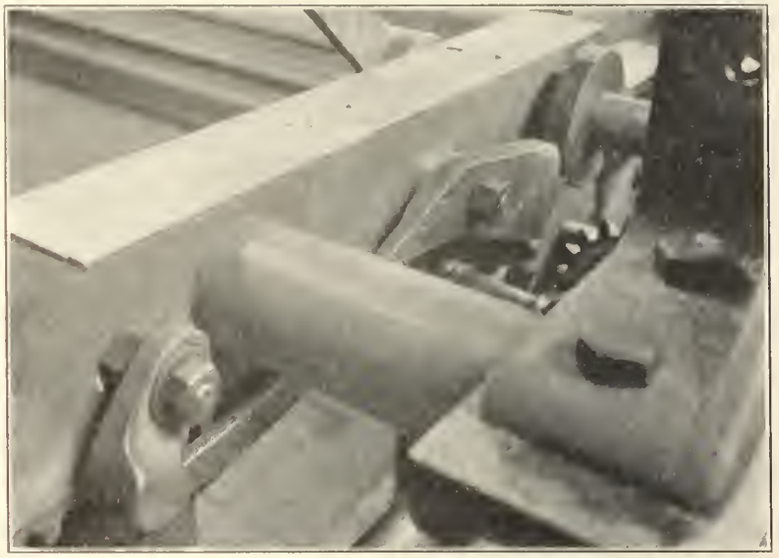
Canadian Society of Civil Engineers, Victoria, B.C., Branch.—Following are the officers for the current year, elected at the recent annual meeting,—Chairman, F. C. Gamble; Vice Chairman, D. O. Lewis; Treasurer, A. E. Foreman; Secretary, R. W. MacIntyre; Auditors, H. A. Icke and F. A. Richardson; other members of executive, E. H. Harrison and L. W. Thoms.

Railway Mechanical Methods and Devices.

Cattle Guard Machine in Grand Trunk Railway Car Shops.

In Canadian Railway and Marine World for Oct., 1912, a full description of the then existing practice of making cattle guards at the G.T.R. car shops, at London, Ont., was given. This practice, while better than that to be found in the majority of shops, is being superseded by a more nearly automatic system of handling the parts, made possible by the construction of a special machine by A. Leclair, millwright in the G.T.R. Montreal shops. Several years ago, he devised a machine for sundry kinds of duplicate work in the Montreal shops, and it was found that it was useful in making the parts of a cattle guard, by adopting special fixtures to it. Since then, the machine has been used entirely for these guards, and so useful has it proved, that it has been decided to equip other shops of the system with the same kind of machine, only the latest development is a considerable improvement on the last production, specialized exclusively for the cattle guard slats.

Machine for Trimming, End Bevelling and Drilling Cattle Guard Slats.



Clamping Mechanism of Cattle Guard Machine.

The machine which has been made in the Montreal shops for London, Ont., is shown in one of the accompanying illustrations, ready for shipment, but is unfortunately marred by the presence of an obstruction in the foreground which does not belong to the machine. The machine consists of a light cast iron frame construction, similar frames at each end and the centre forming the whole under structure. Carried in three bushings, one in each of the frames, there is a shaft extending the length of the machine, on which in any desired position may be secured saws or knife heads. These heads are protected by sheet iron hoods, attached to a shaft in the rear, and which may be shifted when it is necessary to get at the knife or saw.

Across the top of each of the three under frame sections, there is a carriage way, on each of which is mounted a carriage, an arrangement similar to the cross slide of a lathe carriage. These three carriages are operated in unison by the large handwheel shown in front, which connects, through a shaft and bevel gears, with a shaft under the cross carriages, spurs on this shaft meshing with racks on the under surface of the carriages.

The original machine of this type was made up for general work. This machine, being specially designed for cattle guard slats, is arranged with a special clamping jig. On the top of each of the tree cross carriages, there is a stop block, the three lined up correctly. These stop blocks hold a wooden jig member, of a section to receive one side of a cattle guard slat. There is a corresponding jig section to the rear, which is adjustable on the carriage, by cams actuated by the vertical lever on the far end of the machine, clamping the member to be machined, in place in these vise jaws.

The details of the clamping mechanism are shown in the other illustration. The lever in the background is on the end of the cam shaft. Pulling the lever over towards the operator, locks the cams in position. On the cam shaft, there is a notched wheel, engaging with which is a knife edged lever, fulcrumed on the end frame. On the near end of the frame, there is a small dog, pivotted on the frame, and which holds the end of the lever down, retaining the jaws in their clamped position. By raising this dog, and giving the clamping lever a releasing pull, the jaws are loosened, so that the slat can be taken out quickly. Then, after inserting a new piece, the lever is pulled forward, and by the dropping down of the dog on the knife lever, the slat is clamped for operating.

The cutter head carries two saws, for trimming the slat to length, and also carries a double cutter head adjoining each of the saws. The initial construction had a single cutter head, but it was found that by making the cutter head in two parts, with knife blades of each set in an opposite direction, the cut was divided, and a better balance obtained. These double headed cutters shave off the end bevel of the cattle guard in the one pass across the machine.

Back of the cutter and saw shaft, there is a secondary revolving shaft, with heads that are adjustable along its length, in which there are drill heads, operating from this shaft through bevel gears. As the cutters and saws are performing their operations, the drills, properly spaced, drill the tie rod holes, so that the slat on coming from the machine is completed.

A somewhat similar machine has been made up for machining the separating blocks, which are bevelled at both ends like the slats, and have one tie rod hole in the centre. All this is performed in the one operation. This machine is almost identically the same as the slat machine, only shorter.

The initial operation on the slats, that of bevelling the tops, is performed on the buzz planer. The slat stock is twice the depth of the completed slats. This stock is passed through the planer on the flat, with revolving knives above and below, spaced one before the other, so that as the stock passes through, channels are planed top and bottom, turning out two completed slats at the other end.

The final assembling of the slats to form the cattle guards is done in a vertical jig, fitting them on one at a time.

Crank Pin Turning Device at Quebec Central Railway Shops.

Considering the amount of machine work to be performed on the part, the work involved in putting a crank pin in shape, is considerable. As usually practised, the locomotive driving wheels are placed in a large hydraulic press, and the pin first of all pressed out. This generally requires the removal of the wheels to another point in the shop, which, in the case of a small shop, without adequate crane facilities, is a considerable task. In consequence, any device that is capable of being used directly on the crank pin when in place in the driving wheel, makes for a considerable saving in time, even if the actual time of machining by an applied device is not as short as when removed to a lathe.

In the Quebec Central Ry. shops, at Sherbrooke, Que. (G. M. Robins is Master Mechanic, and E. M. Green, General Foreman Machine Shop), such an applied device for turning crank pins is in use, and is illustrated herewith. The device depends initially on the fact that the threading for the crank pin nut is concentric and uniform with regard to the body of the crank pin. The body of the tool consists of two parts. An inner stem is threaded as a nut at one end, this end screwing on over the crank pin threading aligning the tool with the crank pin. This extending pin carries a long sleeve as shown. This sleeve carries on its inner end an offset arm, which extends over the crank pin surface, and in its extremity it has a small adjustable cutting tool. The inside guiding pin is stationary,

while the sleeve is revolved by an air motor, attached to an improvised train of gears. The gear train frame is held down by a link and turnbuckle to the floor. On the outer end of the device, there is a ratchet mechanism, for feeding the outer sleeve with its tool, over the face of the crank pin. This ratchet mechanism consists of a dog attached to the sleeve end, adjoining a cam disc, which is stationary. As the dog revolves with the sleeve, it follows the surface of the cam, dropping into an adjustable surface cut out at a certain point in its revolution, falling into a depression of a notched wheel, the latter being on a spindle connecting through a long screw with the inner stem. The outer end of this part is rigidly secured to a brace from the floor (not shown), so that as the screw is revolved slightly on each turn, the sleeve is fed forward a corresponding amount.

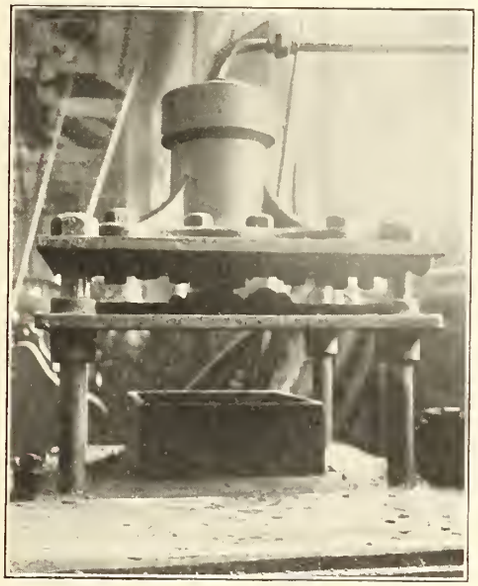
The operation of this mechanism is quite rapid, as from its simplicity, it requires but little time to assemble, and as the cut to be removed from the pin is usually very light, only enough to true it up from the oval shape into which pins tend to shape in service, the rapidity with which the cut can be taken is, considerable, resulting in a neat job, without the attendant task of removing the drivers. In fact, all that is necessary to do to handle a job is to remove the connecting and side rods, with their brasses, and the pin is prepared for machining.

Grease Cellar Press at Grand Trunk Ry. Montreal Shops.

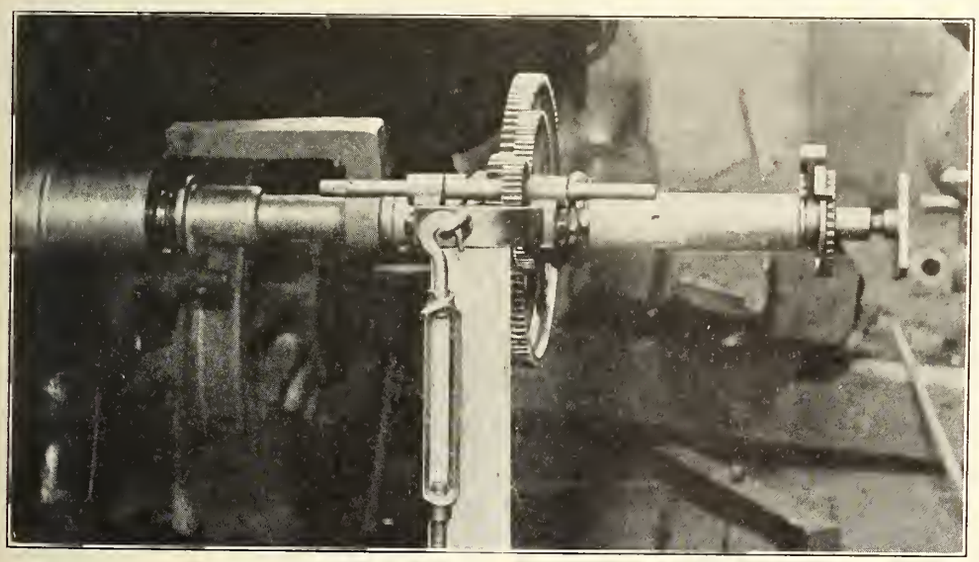
The accompanying ilustration shows the grease press in use at the G.T.R. Montreal locomotive shops, and which is located in a small depression in the floor adjoining a window. Alongside the press is the grease barrel, and in front of the press a working table. A special cast iron mould is used, the inside dimensions of which are the exact size of the block of grease to be moulded. The lower surface of the mould is the concave one to fit over the axle.

The practice is to first place a curved sheet of thin sheet iron in the mould, next filling the mould by hand as full as it is considered desirable, then placing the mould under the press, the flat surface of which, descending under hydraulic power, forces the hard grease into all the crevices of the mould, forming a solid block. The surplus overflowing the top is trimmed off with a hand scraper, and the mould again subjected to a pressure from the ram, when the block is ready to be taken from the mould.

Through the under side of the mould there is a tapped hole. A hand bolt is screwed through this on the completion of the compressing, the bolt, coming in contact with the sheet metal mould liner, forces the block of grease out, when the operation is again repeated. This process is carried on in the wheel shop under J. Hunter, Foreman Wheel and Tender Shops.



Grease Cellar Press, Hydraulically Operated.

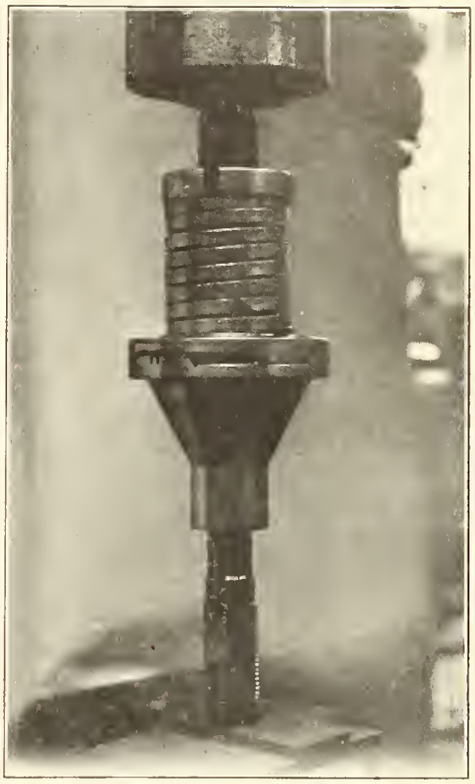


Crank Pin Turning Mechanism, Applied to a Locomotive.

Tapping Attachment at Grand Trunk Ry. Montreal Shops.

The accompanying illustration shows a very useful tapping attachment used in the G.T.R. Montreal locomotive shops, (J. Lees, General Foreman, Machine Shop,) for tapping through blind holes in castings. It is used in a reversing drill press, and of course would be of no value in a drill that had not a reversing attachment.

The device consists of a tap at the bottom, the upper end of which is enlarged to form a clutch face, having two shallow radial clutch jaws. Engaging this face, there is a corresponding radial clutch surface. The power transmitting faces are at an angle of about 45 degrees. The upper disc is keyed to a threaded spindle, carried in the spindle of the lathe. A projecting pin from the upper spindle of the tool, projects into the lower members, making the two parts as one. Around the upper spindle, there is a square coiled spring, the tension in which is varied by a screw collar fitting over the thread of the spindle. This spring bearing down on the upper clutch disc, keeps the two closely engaged, but in the event of a hard spot in the casting being encountered, or the tap being stalled from any cause, the upper clutch disc will rise on the 45 degree engaging faces, allowing the tap to slip. The spring may be adjusted to whatever tension is desired, bearing in mind the strength of the tap. A safety device such as this has a marked saving in the number of taps required.



Safety Tapping Attachment.

A Long Girder Span Replacing a Howe Truss was put in place on the Duluth, South Shore & Atlantic Ry., a C.P.R. subsidiary, at its crossing over Bad River, near Shilo, Wis., recently. The Howe truss span was 150 ft. long and formed part of a timber trestle 955 ft. long. The entire structure was replaced by a plate girder viaduct of 30 ft. tower spans and 64 ft. intermediate spans, with a 121 ft. deck plate girder river span. This span complete weighed 108 tons. It was riveted up on two flat cars which were run on to the deck of the old span. The span was lifted off by a derrick car at one end and a gallows frame hoist at the other end, the cars were run out, the deck of the old bridge torn away, and the new span lowered between the old trusses on to the previously erected steel bents.

Signalling on Western Lines, Canadian Pacific Ry.—We are officially advised that there are now in operation automatic station protection signals of the upper quadrant semaphore type between Fort William and Winnipeg, upper quadrant automatic signals between Stephen and Field, and between McGillivray and Crowsnest, B.C., and automatic station protection signals through the Calgary terminals.

White Pass and Yukon Railway Co.'s Annual Meeting.

The annual meeting was held in London, Eng., Dec. 16. The chairman of the company, C. C. Macrae, said:—

I shall invite your attention to the principal figures in the accounts. Interest on local securities remains as usual. Dividends on shares of local companies yield £47,756, as against £34,142 in the previous year. On the debtor side of that account the figures are substantially similar to those in the preceding year, but the larger amount received from dividends paid by the local companies and various reductions in the items of expenditure increase the balance of profit carried to the balance-sheet by £15,178—or £41,018, against £25,840 in 1912. Going to the balance sheet, the item of our holding in securities of the local companies, taken at cost price, remains at £2,374,011. The balance due from local companies stands this year at £47,294, as compared with £56,509 in the previous year. The sinking fund investment is increased from £210,819 to £239,984, and we have a further credit this year of £4,849 expended in advance for the sinking fund contribution required for the year ended June 30, 1913. On the debit side of this account the items remain constant until you get to that of sundry creditors, which stands at £5,419, against £19,109 in the preceding year, or a reduction of £13,690. The item representing the sinking fund is increased in the natural course of the accumulations to that fund by an amount of £29,165, and the profit and loss account is brought up from £35,090 in 1912 to £44,392 in 1913, in the way shown in the balance sheet. Deducting from this £18,591 reqired for the sinking fund instalments due this year, there remains a balance of £25,801, which would have been sufficient to enable a dividend at least equal to that paid last year to have been distributed, but which, for considerations which I shall explain to you when I have finished with the figures, the directors recommend to be carried forward to next year.

Turning to the report of the President of the local companies, a comparison of the figures shows that in the rail division there were carried 10,898 passengers and 51,517 tons of revenue freight, against 10,441 passengers and 20,028 tons of revenue freight in the preceding year. This large increase of about 150% in the tonnage of paying freight carried is very gratifying, and is principally due to the active development in the copper mining work done in the White Horse territory. The average load per car is also materially increased, an important matter as regards the cost of carrying. The operating expenses, which have shown substantial decreases in each of recent years, show a decrease of $42,318, as compared with the previous year, and of $109,446 as compared with the year before that. In the river division the number of passengers carried is, curiously enough, almost identical with that of the previous year, while the tonnage of revenue freight carried is increased by about 6%, or from 15,825 tons to 16,723 tons. This traffic was worked with one steamer less than in the preceding year. It is also satisfactory to note that the season during which the fleet operated was prolonged by about a week at the opening, and that the last boat (from Atlin to Caribou) ran as late as Nov. 2, which beats the record for date of running in the history of the White Pass companies. On this point I may ask you to note a statement in Mr. Dickeson's report to the effect that "two small steamers endeavored to operate later than ourselves, with the result that they were both frozen in at Indian River." Owing to the longer season there was an increase in the expenses of operating this division of $5,931, but this was offset by the increased revenue obtained from the larger business done. On the winter mail service figures I need say nothing, except that they correspond fairly closely with those of the previous year, while the operating expenses are substantially reduced. The anomaly of the situation in which your chairman regularly finds himself at these general meetings is that he has to address you at the end of each year upon a report and accounts relating to the previous year only, while at the time he knows generally what has been the result of the companies' operations in the succeeding year—namely, the year in which he is speaking. I have myself always endeavored in my speeches at these meetings to confine my own remarks to the period strictly before the meeting—although later information has ordinarily been given by the President of the local companies—but, inasmuch as in the report before you we recommend the carrying forward of the whole balance of profit and loss instead of paying a dividend thereout, as the figures justify, and, inasmuch as our reasons for coming to this decision are due to circumstances which have arisen in the present year—that is, the year after that dealt with in the report before you—I am compelled to travel outside the period of that report in order to explain to you why we have come to this conclusion.

Briefly, then, let me say that in the present year we have been faced with an organised attempt to compete for our traffic, which has left us no alternative but to fight to hold our own and prevent ourselves from being driven out of the business which we have built up at such great cost and by so many years of hard work. It was a veritable fight for existence, and not of our seeking. But it was forced on us, and, that being the case, Mr. Dickeson has faced the situation with energy and resource. The war, although costly to both sides, and telling on the revenue of the company by reason of the cut rates, which are an invariable feature of these fights has resulted in this company maintaining and, I trust I may go so far as to say, even strengthening its position. But a situation has been created which will prove of the greatest permanent advantage to the enterprise, but in which it is of the utmost importance to the future interests of this company that its cash resources should be maintained at the highest possible level. This situation is of a character that, having regard to negotiations which are now pending in the way of its development it is most inexpedient that I should, at present, further explain it, and I must ask your forbearance to excuse me from now giving details and your trust in your board that they are doing what, with the knowledge they possess, they believe to be in your best interest. All I would say is that we have reason to hope these negotiations may prove to be successful, and if they turn out as we trust they may do, I believe, and I am fortified by the opinion of Mr. Dickeson, the position of the White Pass Co. will be stronger than it has been at any time in its history, and we may look forward with reasonable grounds of assurance to a future of prosperity for the company, and to very much more satisfactory results than those we have experienced in recent years of struggle with aggressive competition and declining traffics.

The report and accounts having been adopted, E. Hanson, of Montreal, and E. F. North, of London, Eng., were re-elected directors.

O. L. Dickeson, of Vancouver, President of the local companies then said.

Last year I dealt at some length with the general conditions of the country, giving my impressions of the situation, and I will refrain, therefore, from again referring to the general conditions, except to say that the ideas expressed at that time remain unchanged, and quite briefly to touch upon interesting new developments. In the Atlin district the gold output increased as compared with the previous year, and additional investments in the improvement of properties in that district have been made throughout the summer, which should ensure further increase in the output next year. An important gold quartz property in the vicinity of Atlin has been opened up, and it holds promise of developing into a permanent paying property. The successful operation of this property would mean renewed interest in the prospecting for the development of other quartz prospects in that district. While the final figures are not available I am informed that the gold output in the Klondyke region increased this year, and a large additional undertaking for the operation of an area of placer ground has been financed and activities on a new and large scale should begin in the Klondyke region following the opening of navigation next year. In the Fairbanks district the production of placer gold decreased, roughly, from $5,000,000 in 1912 to about $4,000,000 in 1913, due to a lack of water. Considerable development and prospecting for gold quartz was carried on. The gold quartz industry in the Fairbanks district is very promising, but has not as yet reached the stage where it has created much traffic. Considerable prospecting was done on the streams tributary to the Yukon River. An entirely new and what promises to be an important discovery of gold was made at Shushanna in May, 1913. The new diggings are located in the White River mining district in Alaska, just across the boundary line from the Yukon territory, or approximately ten minutes north of latitude 62, longitude 142. From the time of discovery in May until September, when prospecting was practically abandoned owing to the lack of food supplies and to winter setting in, roughly $30,000 was taken out of the discovery claim by a few men with the hand sluicing method. It was only late in July when this discovery was made public in Dawson, and intense interest was immediately manifested, and a stampede was made from all directions, with the result that several hundred people reached the diggings, but only in time to stake claims and return for additional supplies before the severe winter weather. In view of these conditions, very little prospecting was possible in the Shushanna district this year. Those who staked claims, however, are returning with supplies and are building cabins, etc., preparatory to prospecting their claims for gold as soon as spring opens.

While this discovery is approximately 320 miles from our line in the interior it is contiguous to our property by reason of our route being the easiest and safest for travel. And in order to assist in the development of this region and to lessen the burdens of the prospector, we have inaugurated a new service, placing in operation a winter trail direct from White Horse to Shushanna for the transportation of passengers and supplies. During the summer the Shushanna district is much easier of access than in winter, as our light draft steamers operating up the White River (tributary to the Yukon) land passengers and deliver supplies at a new town called Donjek, within about 90 miles of the discovery. From this

point to Shushanna the trip is overland by trail. Our mining engineer was sent to the district to make a general report of the prospects, and, while we do not wish to predict the extent of value of the discovery, from his report and from such general information as is obtainable from all sources, it is safe to say that the region holds promise of being a rich camp, which means added traffic for the railway and boats next year. The Tantalus coal mine, 200 miles below White Horse, on the Yukon River, installed new and more modern machinery, extended development work throughout the year, and explored new veins of coal. A series of tests of the coal has been made on our locomotives, and it has been demonstrated that it is suitable for our use. This means permanent local industry on the line, and is better for us than buying coal on Vancouver Island and paying duty for delivery in Alaska. In the White Horse district development work and shipment of ore continued throughout the season, the railway having carried 36,000 tons of ore during 1913, the largest ore tonnage in any year in the history of the company. The company has reason to feel much encouraged by the results of development work so far accomplished in this district, and the development under way undoubtedly promises permanency of traffic. The successful operations in that district will also lead to renewed activity along the same lines in other districts where similar copper prospects are known to exist. The railway transported ore throughout the winter of 1912 and 1913, and demonstrated the physical possibility of so doing at all seasons, but the winter carriage of ore did not prove sufficiently profitable under the state of development then existing. It was determined, therefore, last spring to mine and ship ore throughout the summer and to discontinue the production of tonnage in winter, devoting attention to development work only preparatory to handling the ore on a larger scale. It may be considered advisable to continue development work and not resume shipping for a considerable period, with a view to determining the extent and value of the deposit so as to enable the working out of an economic solution of operating the mine. Our tourist traffic has been increased this year, and we may confidently look forward to a much greater number of tourists when the country becomes better known to the pleasure seeking public. A satisfactory feature is that the tourists are well pleased, and many of them state that they will induce others to make this wonderful trip.

I cannot speak too highly of the attitude of the present Canadian Government in lending their assistance to new projects for the development of the Yukon. This year the Government appropriated an additional sum of $50,000 for the improvement of the overland trail between White Horse and Dawson, and it is expected that additional appropriation will be made so as to place the trail in such shape as to admit of the use of automobiles for the transportation of freight and passengers, thus eliminating the present expensive methods of handling traffic on the trail and lessening the cost of transport to the public. The Government is also considering a proposition for the construction of a dam at Miles Canyon, near White Horse, the head of navigation, for the purpose of storing and controlling the flood waters, which will improve the transportation conditions at all stages of water in the river, and will ensure a longer season of open navigation. We confidently hope an appropriation for this purpose may be made in Ottawa during this winter, particularly as the amount of money required is so very small as compared with the benefit to be derived. The work could be started as soon as the money could be available.

As a result of conditions growing out of a policy spread over a period of years of handling business destined to Dawson, a very serious situation arose which threatened to divert to the St. Michael's route a large portion of the traffic which we felt should properly be routed over our line. Negotiations for the adjustment of these conditions were carried on for a considerable period without, however, any acceptable conclusion being reached, and at last it became necessary to establish an entirely new connection for the interchange of traffic at Dawson in order to preserve our interests. Two new modern boats of American register were constructed for this purpose, and were placed in operation between Dawson and Fairbanks, on the lower river. As a result of the establishment of this new connection giving a through service to Fairbanks, we received approximately $25,000 of gross revenue which we should not otherwise have received. The establishment of this service brought about a most vigorous rate war on the Yukon River. Rate wars are usually disastrous to all parties engaged, but our railway occupied the peculiar position of obtaining additional traffic at acceptable rates sufficient to offset the reductions which were made on the river to meet the cut in rates while at the same time our competitors handled at a loss all the traffic delivered by them to us as a direct result of the war. While it is our policy to work in harmonious relations with other transportation companies, we were not in this instance able to secure what we considered a fair and reasonable working arrangement. The rate war was not of our seeking, but in spite of it we find ourselves in a much stronger position than we were in before the inauguration of this new service. Further, one of the ocean lines, having a regular established service from Seattle to Skaguay as well as to St. Michaels, undertook to divert a large part of the traffic to the St. Michaels route, discriminating against their Skaguay route and our line. This made it necessary for us at once to arrange terms with a new and independent line of steamers to handle the traffic we control on the ocean; and the White Pass Co. could better afford to keep some such arrangement in effect permanently, even at a heavy annual loss in handling the traffic on the ocean, than forego its fair share of the Yukon traffic over the railway. It is not unlikely that this state of chaos in the handling of the ocean traffic may continue, and, if so, it is inevitable that we should at once take into consideration the question of the establishment of a permanent first class line to handle both freight and passenger business between Seattle, Vancouver and Skaguay. The boats operating on this run at present are sufficient to handle the traffic under ordinary conditions, and it would be unwise to establish such a service if the traffic between these points alone was the only consideration. But the White Pass, having already such a large investment to protect, the additional undertaking would be quite small having regard to the interests involved. We have been collecting data upon the question for some time for the purpose of determining the revenues to be derived and the future possibilities. The year 1915 would be an especially appropriate time for the inauguration of such a service to coincide with the Panama Pacific Exposition in San Francisco, from which we shall undoubtedly derive a large tourist traffic. If this link in the service were arranged the public would have the advantage of a first class through line from Seattle and Vancouver, via the White Pass, to Fairbanks—a distance of 2,600 miles. We should be free from all risk of discrimination against us on the ocean, and be able to pursue an unhampered policy in the steady development of business for our route.

In spite of the rate war, and indeed partly because of it, our gross business increased. The number of passengers carried in 1912 was 13,356, and in 1913, 18,038—an increase of 35%. The general freight tonnage amounted to 23,716 tons in 1912, and to 24,196 tons in 1913—an increase of 2%. Ore handled in 1912 amounted to 31,230 tons; in 1913, 36,693 tons—an increase of 17.5%. Naturally, under the conditions that have prevailed, the revenue per ton and per passenger will not show the same relative increase. But the figures that I have given show conclusively that we have more than held our own. The gross revenue of the company by the end of Dec., 1913, will be approximately $1,215,000, a considerable increase over 1911 and a slight increase over 1912, which is a most satisfactory condition, having regard to all the attendant circumstances.

The Canadian Pacific Railway's New Terminals at Vancouver.

The construction of a modern terminal for the C. P. R. at Vancouver, the general features of which were described in Canadian Railway and Marine World, embracing both railway and steamship facilities, has been under way for more than a year, and the $1,000,000 station has been advanced to such a point that the east section is to be ready for occupancy by Feb. 1. Work is being rushed to completion on the east end so that offices can be moved there from the old station, which adjoins the new building on the south, and which must be torn down before the present improvement scheme can be completed.

The new building is a steel frame structure six stories high, and has a frontage of more than a block on Cordova St., where the architectural design provides a series of massive Corinthian columns standing out from a brick background, with stone cornices and trimming. A four track passenger platform, 1,000 ft. long, is being provided.

Besides the station proper, the terminal work under way now includes inclined viaducts from Granville and Burrard Streets to the waterfront, the extension of several docks for distances ranging up to 450 ft., and the erection of structures for offices and waiting rooms on the piers. The Granville St. viaduct, whose lower end will form part of a combined passenger station and freight shed on one of the piers, will bring down all the wharf traffic from the chief thoroughfare of the city. This viaduct will pass the western end of the new railway terminal well above track level, and will cross the site now occupied by the old station, which as above stated, is to be demolished.

The Burrard St. viaduct will also bring traffic down to the docks from the city level by an incline over the yard trackage. Steel girders for the substructure of this viaduct had been placed before Dec. 1, but completion will not be possible until the old detention sheds on the wharf have been torn down. Dominion authorities have recently received tenders on a new structure for the Immigration Department, and as soon as this can be completed the old sheds will be removed to make room for a spacious viaduct terminus.

The dock scheme now in course of development by the railway company embraces a water frontage about ¾ mile long. The capacity of the freight sheds has already been increased by erecting new buildings extending to the present line of the property leased to other shipping interests, and new machine shops, where repair work is car-

ried on for the coasting steamers and ocean liners, have been provided. In the upper floor of one of the new buildings the company has equipped a hall which is to serve as a waiting room far the longshoremen. The quarters are spacious and comfortable, shower baths being among the conveniences installed.

Book Review.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

A CENTURY OF SAIL AND STEAM ON the Niagara River—By Barlow Cumberland. 198 pages, 9 by 6 in., with portralt and 12 illustrations; cloth boards. Musson Book Co., Toronto. $1.50 net.

Under this title Barlow Cumberland wrote an interesting and valuable volume, the final proof sheets of which he corrected a few weeks before his death, Sept. 1, 1913. Considerable attention has been given by U.S. writers to the publication of historical accounts of the development of navigation on the Great Lakes, but this ls the first serious attempt to give a history of Canadian navigation. The late Charles Gildersleeve, General Manager of the Richelieu and Ontario Navigation Co., intended to contribute a general history of navigation on Lake Ontario, but he died suddenly without having accomplished it. The late Mr. Cumberland then undertook to deal with the development of navigation on the Niagara River route, with which his career as a transportation official had been closely accomplished. The result is a volume of 198 pages, in the course of which is given the entire history of navigation on the river and the routes, particularly those on Lake Ontario, convergIng thereon. The history is more directly that of the Niagara Navigation Co., which entered into competition for traffic on the route in 1878, with the Chicora, and succeeded not only in subduing opposition, but in building up the great traffic now carried between Toronto and points on the Niagara River. The volume deals in an interesting, gossiping manner with the route, the vessels, sail and steam, which have navigated it, and with the men responsible for them. Other routes are referred to, but it is only as the steamboats, or men from them come on to the Nlagara route. Probably for the first time the history is given of the Chicora, built in 1863 as a blockade runner, and still running, though largely replated in 1904, at a cost of $37,000. The volume is illustrated with a portrait of the author, and reproductions of prints, etc., of various vessels that have been on the route.

As a result of the recent report of the conciliation board appointed to enquire into the wages, etc., of the G. T. R. telegraphers, it is announced that wage increases aggregating $200,000 a year have been agreed upon, one half of the new rates to be granted as from Jan. 1, 1914, and the remainder as from Jan. 1, 1915.

The Canadian Northern Telegraph Co. has completed its telegraph line between Ottawa and Sydenham, Ont., thus making direct connection between Ottawa and Toronto. The telegraph line between Sudbury and Port Arthur is now being erected, and it is hoped to have it complete early in the year.

The City of Toronto assesses the Canadian Pacific and Ontario and Quebec Railways $6,551,401, and the Grand Trunk Ry $5,302,040.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

General order 113, Nov. 5.—Rescinding order 8392, Oct. 7, 1909, approving standard conditions and specifications for wire crossings; and adopting rules for wires crossing railways.

General order 114, Nov. 12.—Approving general form of contract between Bell Telephone Co. and any company, municipality or corporation having authority to operate telephone systems, for interchange of business, etc.

General order 115. Dec. 19.—Suspending, pending investigation by the Board, the following tariffs: G.T.R.'s C.R.C. E.2858; C.P.R.'s C.R.C. E.2716; C.N.R.'s C.R.C. E.358; M.C.R.'s C.R.C. 2162; T. H. & B. R.'s C.R.C. 945; and O. & N. Y. R.'s C.R.C. 989.

General order 116. Dec. 24.—Suspending, pending investigation by the Board, increased minimum carload weights on buckwheat, oats, bran (in bulk), dried beet pulp, oat hulls (in bulk), pea hulls (in bulk), shorts, beets (except sugar), onions, turnips, and potatoes, as filed by railways subject to Board's jurisdiction.

20920. Nov. 28.—Authorizing Canadian Northern Ry. to build spur for Laurentia Milk Co., Battleford, Sask.

20921. Nov. 29.—Extending, to Apr. 1, 1914, time within which subway be completed at Thompson Road, Bertie Tp., Ont.; and, pending completion, G.T.R. to employ day and night watchmen there.

20922. Nov. 29.—Authorizing G.T.R. to operate over interlocking plant, St. Lambert, Que., without first stopping trains.

20923. Nov. 27.—Authorizing G. T. Pacific Ry. to build highway across main linc at mileage 523.6, between Secs. 27 and 28-35-14, w. 3 m., Sask.

20924. Nov. 28.—Authorizing Vancouver, Victoria and Eastern Ry.and Navigation Co. (G.N.R.) to open for traffic its double track between milepost 145.84 and 153.619, B.C.

20925. Nov. 25.—Re rating of peanut butter. This order is given in full on another page.

20926. Nov. 29.—Authorizing C. N. Ontario Ry. to build transfer tracks between its Oshawa spur and Oshawa Ry., on east side of Lot 9, Con. 11, Oshawa.

20927. Nov. 29.—Amending order 20647, Oct. 23, re deviation of Lake Erie and Northern Ry., in South Dumfries Tp., Ont.

20928. Dec. 2.—Approving clearances as shown on plan of Montreal Ice Co.'s buildings at C.P.R siding at Como, Que.; men to be kept off sides of cars.

20929. Dec. 1.—Authorizing C.P.R. to open for traffic portion of its deviated line at bridge 39.49, North Bay Subdivision, Ont.

20930. Dec. 1.—Authorizing C.P.R. to open for traffic its Boissevain-Lauder Branch, Man., from mileage 0 to 36.4.

20931. Dec. 2.—Approving plans of automatic signals on C.P.R. Eastern Lines, from Montreal Jct. to Iberville Jct, Que.; West Toronto to Ilsington, Ont.; Markstay to Stinson, Ont.; Mattawa, Ont.; and Renfrew to Eganville, Ont.

20932. Dec. 1.—Authorizing C.P.R. to build spur for City of Regina, Sask., and to alter spur for Gus Pech Foundry and Mfg. Co., Regina, Sask.

20933. Dec. 1.—Approving location of C.P.R. stations on Virden-McAuley Branch, Man., at Two Creeks, mileage 13.5, and Harmsworth, mileage 8.7.

20934. Dec. 1.—Authorizing Magog Tp., Que., to build highway crossing over C.P.R. in Lot 4 b, R. 21.

20935. Nov. 29.—Authorizing C.P.R. to build spur for Halliday Bros., Winnipeg.

20936. Dec. 1.—Extending, for 30 days from date, time within which G.T.R. shall install bell at crossing of Mill St., Milverton, Ont.

20937. Dec. 1.—Authorizing G. T. Pacific Ry. to build spur for J. Latimer, Edmonton, Alta.

20938. Dec. 1.—Authorizing C. N. Ontario Ry. to build its ballast pit spur across 2 highways in Gloucester Tp.

20939. Dec 2.—Amending order 10568, Feb. 26, 1910, re Michigan Central Rd. crossing of Plymouth Rd., Welland, Ont.

20940. Dec. 3.—Approving location of C.P.R. Swift Current Northwesterly Branch from Sec. 15-23-29, w. 3 m., mileage 111.17, to Sec. 12-5-3, w. 4 m., mileage 134.48, and authorizing building of same across 23 highways.

20941. Dec. 3.—Approving location of C.P.R. Bassano Easterly Branch from n. e. ¼ Sec. 13-24-1, w. 4 m., mileage 118.39, to Sec. 6-26-21, w. 3 m., mileage 180.20, and authorizing building of same across 63 highways.

20942. Dec. 1.—Extending, to July 1, 1914, time for approval of C.P.R. tolls hetween points in Canada west of and including Sudbury, Ont., to and from points west of Sudbury, from and to points east thereof, and east of and including Windsor, Ont., also included in said tariff; during such period C.P.R. is allowed to charge tolls it was authorized to charge under acts 7-8 Edw. VII., chapter 61.

20943. Dec. 2.—Authorizing, until June 1, 1914, Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate trains over crossing of Oshawa Ry. at mileage 158.85, Prospect St., Oshawa, Ont.; crossing to be protected by flagman at expense of C.L.O. & W.R.

20944. Dec. 3.—Approving location of C.P.R. station at Willom, mileage 26.5, Virden-McAuley Branch, Man.

20945. Dec. 2.—Authorizing C.P.R. to build spur on land leased from Dominion Government, northeasterly of its right of way and Dog Lake, in Tp. 46, Algoma District, Ont., at mileage 58.8, Lake Superior Division.

20946, 20947. Dec. 1.—Extending, to July 1, 1914, time for approval of Great North Western Telegraph Co.'s and Canadian Northern Telegraph Co.'s tolls.

20948. Dec. 3.—Authorizing C. N. Western Ry. to build across and connect with city industrial spurs, Medicine Hat, Alta.

20949. Dec. 2.—Authorizing Canadian Northern Ry. to build spur for Scott Fruit Co., Regina, Sask.

20950, 20951. Dec. 1.—Extending, to July 1, 1914, time for approval of White Pass and Yukon Route, and G. T. Pacific Telegraph Co.'s telegraph tolls.

20952. Dec. 4.—Authorizing G. T. Pacific Ry. to build Government Road Diversion across its main line at mileage 818.6 west of Winnipeg, in North Alberta District.

20953. Dec. 5.—Authorizing C.P.R. to build siding at Melba, across highway between n.w. ¼ Sec. 18-17-3, and n.e. ¼ Sec. 13-17-4, w. 3 m., mileage 41.9 from Moose Jaw, Sask.

20954. Dec. 5.—Relieving C.P.R. from providing further protection at crossing of First Ave., Souris, Man.

20955. Nov. 24.—Ordering that crossing at Broadway St., Yorkton, Sask., be protected by watchman, appointed by C.P.R., from 8.30 a.m. to 8 p.m., except during grain shipping season, when crossing be protected night and day; wages to be paid 60% by C.P.R., and 40% by town.

20956. Dec. 5.—Extending, to May 15, 1914, time within which C.P.R. shall complete spur for Canadian Metal Shelter Co., Winnipeg, authorized by order 19325.

20957. Dec. 5.—Authorizing C.P.R. to build at grade, additional track (second track) across highways at mileage 40.8, 43.7, 50.3, 51.3, and 66.69, Swift Current Subdivision, Sask.

20958. Dec. 5.—Amending order 20502, Oct. 6, re revised location of C.P.R. double track, mileage 59.6 to 60.45, Moose Jaw Subdivision, Sask.

20959. Dec. 5.—Authorizing C.P.R. to use bridge 6.3, Teeswater Subdivision, Ont.

20960. Dec. 3.—Authorizing G.T. Pacific Branch Lines Co. to build spur for Hamilton Bros., Fort Qu'Appelle, Sask.

20961. Dec. 4.—Approving G.T.R. plan B, Nov. 25, showing location of transfer track, Port Hope, Ont.

20962. Dec. 3.—Ordering G.T.R., within 60 days, to install automatic electric bell at crossing of highway, ½ mile west of Keane station, Ont., 20% of cost to be paid out of railway grade crossing fund.

20963. Dec. 5.—Authorizing G.T. Pacific Branch Lines Co. to operate trains over crossing of Canadian Northern Ry. Maryfield Branch in n.w. ¼ Sec. 9-5-6, w. 2 m., Assiniboia District, Sask., without stopping.

20964. Dec. 4.—Ordering G.T.R., within 60 days, to install improved type of automatic bell at crossing of public road west of Ste. Justine station, Que.; 20% of cost to be paid out of railway grade crossing fund.

20965. Dec. 4.—Extending for one year from Dec. 1, order 12723, Dec. 6, 1910, which authorized C.N. Ontario Ry. to cross Hurdmans Road, Nepean Tp., and providing for protection of crossing by gates.

20966. Dec. 9.—Substituting plan 53515 of C.P. R. bridge 92.7 (Don viaduct), near Donlands, Ont., as revised to Dec. 5, for plans approved by order 20827, Nov. 14, openings to be left in bridge between piers 11 and 12 and 15 and 16, as shown on plan A.

20967. Dec. 10.—Approving proposed Supplement 2 to Canadian Freight Classification 16, submitted by G. C. Ransom, Chairman, Canadian Freight Association, to become effective by Jan. 20, 1914.

20968. Dec. 5.—Authorizing G. T. Pacific Ry. to build highway across its main line in Alberta at mileage 763.7 west of Winnipeg.

20969. Dec. 5.—Approving revised location of G. T. Pacific Ry. main line from Lot 5337 to Lot 5336, Cariboo District, B.C., and location of station in Lot 5336, at mileage 95, Yellowhead Pass west, B.C.

20970. Dec. 6.—Authorizing C.P.R. to rebuild bridge 2.0, Montreal Terminals, Eastern Division.

20971. Dec. 10.—Amending order 20775, Nov. 6, re C.P.R. spur for Frontenac Floor and Wall Tile Co., Kingston, Ont.

20972. Oct. 31.—Establishing express collection and delivery limits in Edmonton, Alta., and rescinding orders 14987, Sept. 11, 1911, and 15759, Jan. 8, 1912, in same connection.

20973. Dec. 4.—Establishing express collection and delivery limits in Levis, Que.

20974. Dec. 9.—Authorizing City of Edmonton, Alta., to operate its street railway over G. T. Pacific Ry. at 27th Street, pending installation of half interlocking plant required by order 20793; crossing to be protected by flagmen maintained by city; and cars to be stopped 100 ft. from diamond; trains to

approach crossing under control, prepared to stop if street railway cars are crossing.

20975. Dec. 9.—Extending, to Apr. 1, 1914, time within which G. T. R. shall install gates at crossing of Wallace Ave., Toronto.

20976. Dec. 9.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build bridge across Athabasca River, mileage 131, west of Edmonton, Alta.

20977. Dec. 9.—Authorizing Esquimalt and Nanaimo Ry. to build spur across Campbell St., Nanaimo, B.C., for Nanaimo Pressed Brick and Terra Cotta Co.

20978. Nov. 27.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate trains, until JJune 1, 1914, over crossing of Toronto Eastern Ry. at junction of Scugog and Wellington Sts., Bowmanville, Ont., mileage 149.2 from Glen Tay.

20979. Dec. 9.—Authorizing C.P.R. to build spur for Imperial Oil Co., Montreal, Que.

20980. Dec. 3.—Approving clearances shown on plan of C.P.R. siding for Imperial Oil Co., Calgary, Alta.; men to keep off sides of cars.

20981. Dec. 9.—Extending, to Apr. 1, 1914, time within which G.T.R. shall commence building subway at crossing of Thompson Rd., Bertie Tp., Ont., and ordering work to be completed within 4 months from that date; pending completion, G.T.R. to employ day and night watchmen; wages to be paid: 15% byP.M.R., 30% by M.C.R., 47½% by G.T.R., and 7½% by Bertie Tp.; and rescinding order 20921, Nov. 29.

20982. Dec. 6.—Authorizing G.T.R. to build siding for Frontenac Wall and Tile Co., Kingston Tp., Ont.

20983. Dec. 9.—Ordering Canadian Northern Ry. to dig ditch 3 ft. wide by 3 ft. deep, from west end of British America elevator, Engelfeld, Sask., to grade approaches to elevator, loading platform and team track, by Aug. 1, 1914.

20984. Dec. 10.—Amending order 20905, Nov. 25, 1913, by substituting G. T. Pacific Branch Lines Co. for G. T. Pacific Ry. where latter occurs.

20985. Dec. 9.—Authorizing C.P.R. to open for traffic its Virden-McAuley Branch from mileage 13.5 to 36.0, Man.; speed of trains limited to 20 miles an hour.

20986. Dec. 10.—Approving location of C. N. Ontario Ry. station grounds at Coniston, Neelon Tp., mileage 257 from Toronto.

20987. Dec. 10.—Approving location of C.P.R. station at Broadacres, Sask., and rescinding order 18915, Apr. 14, in same connection.

20988. Dec. 10.—Establishing express collection and delivery limits in Liskeard, Ont.

20989. Dec. 9.—Authorizing C.P.R. to build Y at Tregarva, Sask., across Railway Ave. Lane.

20990. Dec. 9.—Authorizing C.P.R. to rebuild bridge 49.8 over Salmon River, near Kingsbury, Que.

20991. Dec. 9.—Authorizing C.P.R. to build its Kootenay Central Ry. across 4 highways at grade in Lots 5033 and 4596, East Kootenay District, B.C.

20992. Dec. 10.—Authorizing City of Fort William, Ont., to build its double track street railway on Frederica St. across G. T. Pacific Ry., apportionment of cost of half interlocking plant reserved.

20993. Dec. 9.—Ordering Canadian Northern Ry. to divert road allowance in Sec. 12-19-24, Man., municipality to provide necessary right of way on payment by C.N.R. of $200.

20994. Dec. 9.—Authorizing G.T.R. to build spur across Montreal St. and Fort William Electric Ry., at West Fort William, Ont., for Canadian Car and Foundry Co.

20995. Dec. 9.—Approving plan showing details of superstructure of Campbellford, Lake Ontario and Western Ry. (C.P.R.) bridge at Simcoe St., Oshawa, Ont.

20996. Dec. 12.—Authorizing Confederation Construction Co. to build its tracks across G.T.R. for construction purposes only, temporary crossing to be protected by an interlocking plant and derails to the satisfaction of G.T.R. Engineer by applicant.

20997, 20998. Dec. 11.—Authorizing C.P.R. to open for traffic its double track from mileage 76.8 to 84.2, Moose Jaw Subdivision; and from Notman, mileage 95.1 to 99.4, Swift Current Subdivision, Sask.

20999. Dec. 11.—Authorizing C.P.R. to build spur for Merchants' Trust and Trading Co., Nanaimo, B.C.

21000. Dec. 11.—Extending, to Mar. 1, 1914, time within which C.P.R. shall rebuild culvert at bridge 53.2, near Arnprior, Ont.

21001. Dec. 9.—Ordering that, within 15 days after G. A. Farrill, Kenilworth, Ont., notifies C.P.R. that he has dug ditch to right of way fence, C.P.R. shall extend ditch on north side of crossing to right of way fence, and place at least 6 ins. of gravel on farm crossing approaches.

21002. Dec. 12.—Authorizing C.P.R. to build road diversion in Sec. 9-34-18, w. 3 m., Sask.; and build its Wilkie-Anglia Branch at grade across same at mileage 40.2.

21003. Dec. 13.—Authorizing C.P.R. to build its Snowflake Westerly Branch at grade across road allowance between Secs. 14 and 15-1-11, w.p.m., Man., at mileage 9.11.

21004. Dec. 11.—Amending order 20878, Nov. 1, re Canadian Northern Ry. passenger service west of Alsask, Sask.

21005. Dec. 9.—Amending order 17522, Sept. 18, 1912, re building of two roads across Esquimalt and Nanaimo Ry. at North Courtpan, B.C.

21006. Dec. 15.—Authorizing C.P.R. to build siding for Canadian Bag Co., Montreal, and approving clearances as shown on plan; men to be kept off tops and sides of cars.

21007. Dec. 10.—Authorizing London and Lake Erie Ry. and Transportation Co. to connect with M.C.R. for interchange of traffic just northeast of St. Thomas station, Ont.; M.C.R. to put in switch and do work on its right of way, furnishing land free of cost; cost of remainder of work to be paid by L. and L. E. Ry. and T. Co.

21008. Dec. 11.—Authorizing C.P.R. to build sidings for City of Montreal at Mile End.

21009. Dec. 11.—Authorizing, until interlocking plant is installed, Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate across C. N. Ontario Ry. in Lot 27, Con. 2, Pickering Tp.; interlocking plant to be installed by June 15, 1914; and pending installation, crossing to be protected by flagmen appointed by C.N.O.R. and paid for by C.L.O. & W.R.

21010. Dec. 9.—Rescinding order 17667, Oct. 4, 1912, in so far as it relieves C.P.R. from fencing portion of its right of way on Kingston and Pembroke Ry., from mileage 29.5 to 32, east side, and mileage 29.5 to 31.5 on west side; and ordering C.P.R. to fence said portion of right of way from mileage 29.5 to 32, on east side, and mileage 29.5 to 31.5 on west side, by May 31, 1914.

21011. Dec. 15.—Declaring that charge of $34 for demurrage on shipments of coal to Canadian Coal and Commission Co., Bienfait, Sask., shipped Dec. 9 and 11, 1912, was illegal.

21012. Dec. 11.—Authorizing Canadian Northern Ry. and C.P.R., pending installation of interlocking plant, to operate over crossing in n. w. ¼ Sec. 16-52-24, w. 4 m., Alta., until June 15, 1914; crossing to be protected by flagmen appointed by C.P.R. and paid for by C.N.R.

21013. Dec. 10.—Authorizing G. T. Pacific Branch Lines Co. and C.P.R. to operate over crossing at Regina, Sask., without their first stopping trains.

21014. Dec. 11.—Approving plans showing G. T. Pacific Ry. 88½ and 75 ft. turntables.

21015. Dec. 11.—Authorizing G.T.R. to rebuild abutments of bridge 63, mileage 152.51, at Holmesville, Ont.

21016. Dec. 13.—Authorizing, pending installation of interlocking plant, C.P.R. and G.T.R. to operate over crossing in west half Lot 14, Con. 2, Trafalgar Tp., Ont., at mileage 32.56 from Toronto; trains to be stopped before crossing diamond.

21017. Dec. 12.—Authorizing G. T. Pacific Ry. to divert Government road at mileage 212, west of Yellowhead Pass, Cariboo Dist., B.C.

21018. Dec. 13.—Approving revised location of G. T. Pacific Ry. through Chig-ni-kath Indian Reserve, from mileage 125.55 to 127.08, R. 5, Coast District, B.C.

21019. Dec. 13.—Authorizing G. T. Pacific Ry. to build highway in n. e. ¼, Sec. 8-45-1, w. 6 m., North Alberta District, Alta., at mileage 1,028, west of Winnipeg, under its main line.

21020. Dec. 13.—Authorizing G.T.R. to build siding for Lyster Wood Box Turning and Enamelling Co., Nelson Tp., Que.

21021. Dec. 15.—Authorizing C.P.R. to use bridge 0.85, Timiskaming Branch, Ont.

21022. Dec. 16.—Approving location of C.P.R. shelter station on east ½ of Lot 18, Con. 4, Asphodel Tp., Ont.

21023. Dec. 10.—Approving location of C.P.R. station at Reeder, Man.

21024. Dec. 9.—Approving alterations required in Campbellford, Lake Ontario and Western Ry. (C.P.R.) to accommodate extra tracks in station grounds in Bowmanville, Ont.

21025. Dec. 12.—Approving Supplement 1 to Express Classification for Canada 3, amending sec. 2 of article T of Tariff of Rates on money, securities, etc.

21026. Dec. 15.—Approving revised location of Canadian Northern Ry. spur for Thomson, MacDougall and Co., Woodlands, Man.; authorizing building over 2 road allowances, and rescinding order 19970, Aug. 6, in same connection.

21027. Dec. 5.—Authorizing Canadian Northern Ry. to open for traffic its Radville-Moose Jaw line from mileage 83 to Moose Jaw, Sask., 3 miles.

21028. Dec. 20.—Ordering C.P.R. to extend to Ontario and Manitoba Flour Mills, Ltd., privilege of milling all rail grain at Sudbury, Ont., in transit om mileage 83 to Moose Jaw, Sask., 3 miles.

21029. Dec. 16.—Ordering C.P.R. to stop its trains 1 and 2 at Biscotasing, Ont., to accommodate local passenger and express traffic, such stops to be scheduled in time table.

21030. Dec. 15.—Authorizing Canadian Northern Ry. to open for traffic its Prince Albert-Battleford Line from Blaine Lake to Denholm, Sask., 42 miles; speed of trains limited to 15 miles an hour.

21031. Dec. 15.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate over crossing of Kingston and Pembroke Ry. (C.P.R.) at mileage 24.8, Glen Tay to Cobourg Line, pending installation of interlocking plant required by order 16490; trains to be stopped and flagged across.

21032. Dec. 16.—Approving revised location of C.P.R. Snowflake Westerly Branch from east to west of Sec. 14-1-11, w.p.m., mileage 8.08 to 9.10, and approving location of said branch from Sec. 14 to Sec. 15-1-11, w.p.m., mileage 9.10 to 10.12.

21033. Dec. 16.—Authorizing C.P.R. to build extension to spur for Port Haney Brick Co., Haney, B.C.

21034. Dec. 17.—Authorizing Canadian Northern Ry. to build spur for Pray and McLennan, Edmonton, Alta.

21035. Dec. 16.—Relieving Canadian Northern Ry. from speed limitation of 20 miles an hour required by order 15380, on its Moose Jaw extension from Radville to end of track, 83 miles.

21036. Dec. 15.—Authorizing City of Edmonton, Alta., to extend Spadina Ave. across G.T. Pacific Ry., G.T.P.R. to build and maintain crossing.

21037. Dec. 18.—Extending, to June 1, 1914, time within which G.T.R. shall install electric bell at crossing of public road west of Ste. Justine Station Que., required by order 20964, Dec. 4.

21038. Dec. 18.—Approving Kettle Valley Ry. location from mileage 27.23 to 50, from Hydraulic Summit westerly to Penticton, B.C.

21039. Dec. 20.—Authorizing Confederation Construction Co. to use crossing over G.T.R. with a flagman until March 1, 1914, or pending installation of interlocking plant required under order 20996.

21040. Dec. 16.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate trains over crossing of G.T.R., at Whitby, Ont., until June 1, 1914; crossing to be protected by watchmen.

21041. Dec. 18.—Amending order 20811, Nov. 13, re extension of C.P.R. siding for Dominion Radiator Co., Toronto.

21042. Dec. 19.—Approving clearances as shown on C.P.R. plan of siding for Canada Linseed Oil Mills, Montreal.

21043. Dec. 20.—Extending, to Aug. 1, 1914, time within which G.T.R. shall complete subway at Brock Ave., Toronto.

21044. Dec. 19.—Relieving G.T.R. from providing further protection at crossing of Brant St., Burlington Jct., Ont.

21045. Dec. 20.—Authorizing G.T.R. to operate over subway at highway leading to Cardinal, Ont.

21046. Dec. 20.—Amending order 19296, May 8, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) crossing of road allowance between Lot 14, Con. 7, and Lot 15, Con. 8, Richmond Tp., Ont.

21047. Dec. 18.—Ordering G.T.R. to build, at Prairie siding, a small freight shed and platform, put present passenger shelter in proper repair, and make arrangements to keep same in proper condition.

21048. Dec. 17.—Ordering Dominion Atlantic Ry. to provide farm crossing for R. V. Ditmars, Deep Brook, N.S.

21049. Dec. 20.—Authorizing C.P.R. to build an extension to present siding for Stag Creek Lumber Co., Eastman, Que.

21050. Dec. 10.—Authorizing G.T.R. to build sidings for Imperial Wire and Cable Co., Montreal.

21051. Dec. 22.—Authorizing C. N. Ontario Ry. to build bridge across south branch of Petawawa River, mileage 121.9 west of Ottawa.

21052. Dec. 19.—Rescinding order 20908, Nov. 27, re removal of Canadian Northern spur to Exhibition Grounds, and authorizing it to remove spur along Ninth St., between Victoria Ave. and Brandon Ave., Brandon, Man.

21053. Dec. 22.—Extending, to Dec. 31, 1914, time within which C. N. Ontario Ry. shall complete transfer track with G.T.R., Port Hope, Ont.

21054. Dec. 22.—Approving plan A showing spans at C. N. Ontario Ry. bridge over Mink Creek, Pentland Tp.

21055. Dec. 22.—Extending, to Feb. 22, 1914, time within which C.P.R. shall complete spur, or switching lead, in Toronto, as authorized by order 20385, Sept. 22.

21056, 21057. Dec. 18.—Approving location of C.P.R. stations at mileage 71.36 from Glen Tay, and at St. Joachim, Ont.; and rescinding order 19291, May 14, in the latter case.

21058. Dec. 19.—Authorizing C.P.R. to build extension to spur for H. K. Wampole and Co., Perth, Ont.

21059. Dec. 20.—Authorizing C.P.R. to rebuild bridge 55 over Naiscootyong River, near Naiscoot, Ont.

21060, 21061. Dec. 22.—Authorizing C.P.R. to build at grade its passing track on main line, Broadview Subdivision, across road allowances between Secs. 25 and 26-9-23, at mileage 25.45, and between Secs. 22 and 23-9-23, at mileage 32.43.

21062. Dec. 22.—Authorizing C.P.R. to rebuild bridge 1.9, Prescott Subdivision, Ont.

21063. Dec. 22.—Authorizing G. T. Pacific Ry. to build across and divert highway at mileage 24, Rural Municipality 247, Saskatoon District, Sask.

21064. Dec. 22.—Extending, to May 31, 1914, time within which G.T.R. shall complete siding for Farquharson-Gifford Co., Stratford, Ont., authorized by order 19874.

21065. Dec. 18.—Relieving G.T.R. from providing further protection at crossing of public road 1 mile south of Brunner, Ont.

21066. Dec. 22.—Authorizing Kettle Valley Ry. to build four bridges over Trout Creek, at mileage 7, 36.8, 24.4 and 23.15, west of Penticton, B.C.

21067. Dec. 22.—Authorizing Saskatchewan Government to build highway crossing over Canadian Northern Ry. at Pinkham, Sask.

21068, 21069. Dec. 22.—Approving location of C.P.R. station in Milton, Ont., and authorizing it to take certain lands for enlarging its yard there.

21070. Dec. 22.—Authorizing C.P.R. to build extension to siding for O. Lemire, Cabane Ronde, Mascouche, Que., mileage 15.88 from St. Martin Jct.

21071. Dec. 20.—Authorizing C.P.R. to build spur with siding for Balsam Lake Quarries, Toronto, at mileage 35.07 from Port McNicoll, Ont.

21072. Dec. 22.—Relieving G.T.R. from providing further protection at crossing of public road 1 mile south of Elmvale, Ont.

21073. Dec. 22.—Authorizing C.P.R. to build spur for Kelley and Anderson, Bonfield, Ont.

21074. Dec. 22.—Relieving G.T.R. from providing further protection at crossing of first public highway east of Glencoe, Ont.

21075. Dec. 22.—Authorizing C.P.R. to build spur

for Imperial Supply Co. Calgary, Alta.

21076. Dec. 22.—Authorizing C.P.R. to build bridge 94.4 (Don Viaduct) for double tracking, Toronto Subdivision, cost of alteration required by opening between pedestals to be paid by City of Toronto.

21077. Dec. 23.—Authorizing C.P.R. to build sidings for Ontario National Brick Co., at mileage 16.02, near Cooksville, Ont.

21078. Dec. 22.—Authorizing C.P.R. to build spur for A. Morely, Lot 12, Con. 9, Tp. Huntingdon, Que.

21079. Dec. 22.—Authorizing C.P.R. to open for traffic its Suffield-Blackie Branch from mileage 26.3 to 57.32, Alta.; speed of trains limited to 15 miles an hour.

21080. Dec. 22.—Ordering Canadian Northern Ry. to fence its right of way in S.E. ¼, Sec. 21-7-25, w. 4 m., Alta.; work to be completed by May 1, 1914.

21081. Dec. 19.—Extending, to June 30, 1914, time within which Dominion Atlantic Ry. shall equip its locomotives with ash pans that can be emptied without any employe going underneath, except in case of emergency.

21082. Dec. 15.—Extending, to July 1, 1914, time within which C.P.R. shall equip its locomotives with ash pans that can be emptied without any employe going underneath, except in case of emergency.

21083. Dec. 22.—Authorizing Algoma Eastern Ry. to use bridge at Little Current, between Goat and Manitoulin Islands, Ont.; all trains to stop at signboards and not to proceed over drawspan until signal is given by bridge operator.

21084. Dec. 22.—Authorizing Edmonton Interurban Ry. to operate cars and trains over crossing of Edmonton, Dunvegan and British Columbia Ry., in N.W. ¼ Sec. 25-53-25, w. 4 m., Alta., without stopping; speed of E. D. & B. C. Ry. trains limited to 15 miles an hour over the crossing.

21085. Dec. 23.—Authorizing Ontario Pipe Line Co. to lay gas pipe along and across bridge over G.T.R. on Bay St., Hamilton, Ont.

21086. Dec. 24.—Authorizing Canada Southern Ry. to build siding across G.T.R. siding to Canadian Steel Foundries, Crowland Tp., Ont.

21087. Dec. 24.—Adjudging that the Board has jurisdiction to entertain City of Hamilton's application for order compelling Toronto, Hamilton and Buffalo Ry. to divert its entrance into Hamilton, via Hunter St., and adopt with G.T.R. and C. N. Ontario Ry. a common location in the north end, etc.; and to order the deviation of T. H. & B. R. within one mile from its present location. This judgment is given in full on another page.

21088, 21089. Dec. 23.—Extending express collection and delivery limits in Lethbridge, Alta.; rescinding order 16043, Feb. 26, 1912; and establishing express collection and delivery limits in Vernon, B.C.

21090. Dec. 26.—Extending, to Feb. 28, 1914, time within which C.P.R. shall install bell at crossing of Main St., Shelburne, Ont.

21091. Dec. 23.—Authorizing C.P.R. to build siding for H. De Chiree, St. Felix de Valois, Que.

21092, 21093. Dec. 24.—Authorizing C.P.R. to use bridges on Runnymede Road, West Toronto, and Jane St., York Tp., Ont.

21094. Dec. 24.—Extending, to Jan. 15, 1914, time within which G.T.R. shall install interlocking plant at Paris Jct., Ont.

21095. Dec. 23.—Approving location of G. T. Pacific Ry. station at Tatlow, mileage 232.4, Prince Rupert east, B.C.

21096. Dec. 26.—Extending, to May 1, 1914, time within which C.P.R. shall complete subway at Dundas St., Woodstock, Ont.

21097. Dec. 26.—Extending, to Feb. 28, 1914, time within which C.P.R. shall install bell at crossing of Main St., Milverton, Ont.

21098. Dec. 26.—Extending, to June 30, 1914, time within which C.P.R. shall complete extension of siding for Quinlan & Robertson, Huntingdon Tp., Ont.

21099. Dec. 27.—Extending, to Apr. 15, 1914, time within which C.P.R. shall complete spurs for Moose Jaw Flour Mills, Ltd., Moose Jaw, Sask., authorized by order 20210.

21100. Dec. 26.—Approving location of C.P.R. station at Valor, Sask.

21101. Dec. 26.—Extending, to Feb. 28, 1914, time within which G.T.R. shall build sidings for Otis-Fensom Elevator Co., Hamilton, Ont., authorized by order 20433.

21102. Dec. 26.—Relieving G.T.R. from providing further protection at crossing of highway east of Walkerville, Ont.

21103. Dec. 23.—Approving location of G. T. Pacific Branch Lines Co.'s station at Coalspur, mileage 36.4, Alberta Coal Branch.

21104. Dec. 22.—Authorizing Algoma Eastern Ry. to open for traffic its main line from mileage 79.80 to 80.80, and spur to station at Little Current from mileage 80.29 to 80.65, Ont.

21105. Dec. 23.—Suspending, pending investigation by Board, tariff C.R.C. no. E.217, effective Jan. 1, 1914, increasing rates on pulpwood, in car loads, from points on Temiscouata Ry. to Riviere du Loup, Que., for local delivery.

21106. Dec. 26.—Authorizing Brandon Municipal Ry. to operate its cars over Canadian Northern Ry. on First St.; cars to be flagged by their conductors.

21107. Dec. 29.—Authorizing Canadian Northern Ry. to carry traffic between Avonlea and Gravelburg, Sask., 79 miles, until June 1, 1914; speed of trains limited to 20 miles an hour for first 26 miles and 15 miles for remainder.

21108. Dec. 27.—Approving location of Burrard Inlet Tunnel and Bridge Co.'s line in Vancouver, B.C., from station 0 to 130+03.6, on south shore of Burrard Inlet.

21109. Dec. 27.—Authorizing Canadian Northern Ry. to build across public road between Sec. 6-28-28 and Sec. 1-28-29, on its Alsask Southeasterly Line, Sask.

21110. Dec. 27.—Approving temporary diversion of G.T.R. about 1 mile east of Merritton Station, Ont., and approving plan showing superstructure of temporary bridge to carry tracks over Welland Canal.

21111. Dec. 29.—Approving location of C.P.R. station at Colborne, mileage 105.1 from Glen Tay, Ont.

21112. Dec. 27.—Authorizing Dominion Atlantic Ry. to open for traffic portion of grade revision from St. George St., Annapolis Royal, N.S., westerly to Allen's Creek, 2790.5 feet, and to use bridge across Allen's Creek.

21113. Dec. 30.—Authorizing C.P.R. to open for traffic its double track from mileage 0 to 6, Medicine Hat Subdivision, Alta.

21114. Dec. 30.—Authorizing C.P.R. to build its Bassano Easterly Branch across 7 highways in Alberta.

21115. Dec. 29.—Authorizing C.P.R. to build spur for C. H. Richards, Saskatoon, Sask.

21116. Dec. 30.—Authorizing Vancouver and Lulu Island Ry. to build branch from 3rd Ave., Vancouver, along and across 3rd Ave. and Granville St., for about 578 ft., to British Columbia Electric Ry. property, adjoining 3rd Ave. and Granville St. bridge, and through same to passenger and freight station to be built there; to be completed within 6 months from date; and approving location of station.

21117. Dec. 29.—Amending order 19256, May 13, re C.P.R. bridge 68.3 over Harrison River, Cascade Subdivision, B.C.

21118. Dec. 27.—Rescinding order 20941, Dec. 3, in so far as it approved plan showing location of C.P.R. Bassano Easterly Branch, from Sec. 22-26-23, to Sec. 19-26-22, w. 3 m., mileage 170 to 173.

21119. Dec. 29.—Approving clearances as shown on C.P.R. plan of minimum clearances of suspended signals in train sheds at Windsor St. Station, Montreal.

21120. Dec. 29.—Authorizing C.P.R. to rebuild bridge 0.7 across Wellington St., Sherbrooke, Que.

21121. Dec. 29.—Relieving Canadian Northern Ry. of restriction of 18 miles an hour on trains over its Goose Lake line, between Kindersley and Alsask, Sask.

21122. Dec. 30.—Authorizing C. N. Ontario Ry. to open for traffic portions of its Toronto-Ottawa Line; to use bridges on such portions; and limiting speed of trains.

21123. Dec. 27.—Authorizing Canadian Northern Ry. to build across 3 highways in Saskatchewan.

21124. Dec. 29.—Authorizing Canadian Northern Ry. to build spur for Huff Gravel Co., Edmonton, Alta.

21125. Dec. 30.—Authorizing Canadian Northern Ry. until July 1, 1914, to carry traffic over its Oakland Branch, Man., from mileage 32 to end of track, 12 miles; speed of trains limited to 12 miles an hour.

21126. Dec. 29.—Authorizing G. T. Pacific Ry. to build its main line across Government Road at mileage 397.4, Prince Rupert easterly, B.C.

21127. Dec. 29.—Suspending, pending investigation by Board, folowing tariffs: C.P.R.'s C.R.C. W.1893, and Esquimalt and Nanaimo Ry.'s C.R.C. 256.

21128. Dec. 29.—Suspending, pending investigation by Board, Dominion Atlantic Ry.'s tariff C.R.C. 395.

21129. Dec. 29.—Authorizing C. N. Quebec Ry. to use bridge over Station Ave., Shawinigan Falls.

21130. Dec. 30.—Approving revised location of G. T. Pacific Ry. main line, Prince Rupert easterly from mileage 273.51 to 281.5; and approving location of station at Perow, mileage 278.0, B.C.

21131. Dec. 31.—Approving G. T. Pacific Ry. Standard Freight Mileage Tariff, C.R.C. 20, between stations on main line and branches in Alberta and British Columbia, between and including Thornton, Alta., and Prince George, B.C.; including and cancelling Standard Freight Mileage Tariff C.R.C. 18, pending judgment in inquiry by Board into rates charged by railways west of Crowsnest, Canmore and Thornton.

21132. Dec. 31.—Ordering C.P.R. to build grain loading sidings 400 ft. long, between Sec. 25-14-29 and Sec. 30-14-28, near McAuley, Man., or at highway crossing between R. 28 and 29, mileage 31.7, and to build a two-car loading platform; to be completed by Sept. 1, 1914.

21133. Dec. 31.—Approving proposed changes to Main St. subway, Winnipeg.

21134. Dec. 30.—Authorizing C.P.R. to build spur for C. V. Drazan, Medicine Hat, Alta.; to be completed within 6 months.

21135. Dec. 24.—Allowing corrections on Lachine, Jacques Cartier and Maisonneuve Ry. plan, re diversion of Harbor St., Montreal.

21136. Dec. 27.—Extending, to Mar. 31, 1914, time within which C.P.R. shall complete branch for British Columbia Brass, Ltd., New Westminster, B.C.

21137. Dec. 31.—Authorizing City of Toronto to build its electric railway across G.T.R. siding to Toronto Type Foundry Co., on Danforth Ave.; interlocking plant to be installed; cost to be paid equally by the city and G.T.R.

21138. Jan. 2.—Authorizing C.P.R. and Canadian Northern Ry. to operate over crossing near North Transcona, Man., without first stopping trains.

21139. Dec. 31.—Ordering Canadian Northern Ry. to build culverts of concrete or corrugated iron pipe, with area equal to a cross section of creek at high water, on Phibbs' farm, Obelisk, Sask.

21140. Dec. 31.—Approving location of Campbellford, Lake Ontario and Western Ry. (C.P.R.) station at mileage 18.00 from Glen Tay, Ont.

21141. Jan. 3.—Authorizing Niagara, St. Catharines and Toronto Ry. to open for traffic its line from town line between Grantham and Niagara Tps. to Niagara-on-the-Lake, mileage 7.1 to 12.1, Ont.; speed of trains limited to 15 miles an hour.

21142. Jan. 2.—Authorizing G. T. Pacific Ry. and Canadian Northern Ry. to operate over crossing in St. Boniface, Man., without stopping trains.

21143, 21144. Dec. 23, 24.—Ordering C.P.R. to install electric bells at crossing of 2 highways near Embro, Ont., mileage 7.5, and 8.4, Ingersoll and St. Marys Branch; 20% of cost to be paid out of railway grade crossing fund.

21145. Dec. 29.—Authorizing Oshawa Ry., for six months from date to operate over crossings on Ritson Road, Oshawa, Ont.

21146. Jan. 2.—Authorizing C. N. Ontario Ry. to take, for purpose of crossing certain streets in Toronto, as authorized by order 18012, portions of Lots 17 and 16, east side of Albany Ave., Toronto, property of G. Webb and Toronto and Niagara Power Co.

21147. Jan. 2.—Amending order 20875, Nov. 21, 1913, re Canadian Northern Ry. crossing of Winnipeg Electric Ry. near Helen and Pembina Sts., Winnipeg.

21148. Jan. 2.—Ordering G.T.R. to establish a rate of 8c. per 100 lbs. on imported wood pulp, in carloads, from Montreal Harbor to Windsor Mills, Que., to include terminal charges at Montreal which are included in rates of G.T.R. general tariff on imported merchandise.

21149. Jan. 2.—Authorizing Hamilton St. Ry. and Toronto, Hamilton and Buffalo Ry. to operate over crossing at intersection of Main and Trolley Sts., Hamilton, Ont., without stopping.

21150. Jan. 3.—Authorizing Algoma Central Terminals, Ltd., to build coal dock at Sault Ste. Marie, Ont., on conditions contained in order in council of Dec. 22, 1913.

21151. Jan. 2.—Authorizing C.P.R. to take certain lands in St. Athanase Parish, Iberville Co., Que., for grading highway where it crosses its line at mileage 17.7.

21152. Dec. 31.—Authorizing C.P.R. to build spurs for Union Grain Co., St. Boniface, Man.

21153. Jan. 5.—Approving plan B-14-36, Oct. 7, 1913, showing C.P.R. standard overhead farm crossing.

21154. Jan. 5.—Authorizing Canadian Northern Ry. to build across Bears Pass, mileage 210.6 from Port Arthur, Ont.

21155. Dec. 31.—Ordering C.P.R. to stop train 33 at Claremont on flag, daily, for 3 months from date.

21156. Jan. 5.—Ordering C.P.R. to erect passenger shelter at Domville, Ont., to be completed by Mar. 1.

21157. Jan. 5.—Amending order 19547, June 10, 1913, re C. N. Ontario Ry. crossing on Eganville Rd., between Pembroke and Stafford Tps., to provide that subway be 25 ft. wide, to allow for sidewalk on northeast side, grade to be 1 in 20.

21158. Jan. 5.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to close portion of road allowance within its right of way, and divert same to cross railway overhead at mileage 54.99, when crossing there, as authorized by order 19360, is completed; and rescinding orders 19296 and 21046, Dec. 20, 1913, in same connection.

21159. Jan. 5.—Authorizing Algoma Central and Hudson Bay Ry. to build spurs in Sault Ste. Marie, Ont., without prejudice to rights, if any, of the city in respect of water lot at foot of Spring St., being considered as a continuation of said highway.

21160. Jan. 3.—Approving location of C.P.R. station at Carseland, mileage 19.04 on its Gleichen-Shepard Branch, Alta.

21161. Jan. 7.—Approving location of Toronto and Niagara Power Co.'s power line from conventional line between Halton and Wentworth Cos., northerly to tower 12, in Burlington, Ont.

21162. Jan. 5.—Approving location of Alberta Central Ry. station at Loch Earn, mileage 61.14 from Red Deer, Alta.

21163. Jan. 5.—Authorizing C.P.R. to rebuild bridge 0.5 across Oxford St., London, Ont.

21164. Jan. 5.—Approving location of G. T. Pacific Ry. station at Endako, mileage 351.4, Prince Rupert East, B.C.

21165. Jan. 5.—Authorizing C.P.R. to build its Kootenay Central Ry., at grade, across highways at Shuswap Indian Reserve, mileage 94.5, and on Lot 3947 (P.G.S.), milcage 101.16, East Kootenay District, B.C.

21166. Jan. 5.—Approving location of C.P.R. station in Lot 25, Con. 1, Hinchinbrooke Tp., mileage 25 from Glen Tay, Ont.

21167. Jan. 5.—Authorizing Bell Telephone Co. to charge tolls as filed with the Board, except Standard Tariffs, C.R.C. 1 and 3.

21168. Jan. 5.—Authorizing North American Telegraph Co. to charge telephone tolls as filed with the Board, except Standard Tariffs C.R.C. 1 and 2.

21169. Jan. 7.—Dismissing application of Town of Chateauguay, Que., for order directing New York Central and Hudson River Rd. to make commutation (10 trip) tickets between Chateauguay and Montreal, good for one year.

21170. Jan. 5.—Authorizing C.P.R. to remove watchman from crossing of its Selkirk Branch by Winnipeg, Selkirk and Lake Winnipeg Ry., until traffic is resumed over same.

21171. Jan. 5.—Authorizing C.P.R. to build spur for Imperial Tobacco Co. of Canada, Calgary, Alta.

21172. Jan. 7.—Authorizing C.P.R. to build, at grade, additional main line track across 6 highways, mileage 47.9 to 51.54 from Broadview, Sask.

21173. Jan. 3.—Authorizing C.P.R. to build siding for J. Maloney, Toronto.

21174. Jan. 8.—Approving C.P.R. plan 54216 showing double tracking of bridge 33.2, Nipigon Subdivision, over Gravel River, near Hartry, Ont.

21175. Jan. 7.—Ordering G.T.R., within 60 days, to move its station at Bulstrode, Que., to location shown on blue print of Jan. 6, 1913.

21176. Jan. 8.—Authorizing C.P.R. to build across highways at mileage 7.94, 15.95 and 16.11, Broadview Subdivision.

21177. Jan. 8.—Authorizing C.P.R. to build a Y connection with its main line at mileage 5.94 from Lanoraie, across lands and streets in Joliette, Que.

21178. Jan. 8.—Amending order 21074, Dec. 22, 1913, re protection of G.T.R. crossing east of Glencoe, Ont., substituting Glencolin for Glencoe.

21179. Jan. 8.—Authorizing C.P.R. to build spur for E. Partington Pulp and Paper Co., St. John, N.B.

21180. Jan. 9.—Authorizing C.P.R. to build its Weyburn-Stirling Branch at grade across 62 highways, mileage 174.08 to 231.47, Sask.

21181. Jan. 6.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across G.T.R. spur at mileage 119.91 and 120.02, Cobourg, Ont., and authorizing the operations of trains over same for 6 months, all trains to stop before crossing and be flagged over by one of the trainmen.

21182. Jan. 5.—Ordering Michigan Central Rd., within 60 days, to install improved type of automatic bell at crossing of first highway east of Waterford Yard, Waterford, Ont., trees on northwest corner of crossing, on each side of private road, to be cut down.

21183. Jan. 9.—Authorizing G.T.R. to build siding for Grant and Jones, Lot 25, Con. 5, Rama Tp., Ont.

21184. Jan. 9.—Authorizing G.T. Pacific Ry. to build spur for Alberta Lumber Co., Edmonton, Alta.

21185. Jan. 9.—Authorizing G.T.R. to build siding for City of Toronto, south of Stephenson Ave.

21186. Jan. 9.—Authorizing G.T.R. to rebuild bridge 56 over Black Rock, Hibbert Tp., Ont.

21187. Jan. 9.—Amending order 21007, Dec. 10, 1913, re connection of London and Lake Erie Ry. and Transportation Co.'s line with Michigan Central Rd., at St. Thomas, Ont.

21188. Jan. 10.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to build spur for Campbell River Lumber Co., near Crescent, B.C., to be completed within six months.

21189. Jan. 10.—Authorizing Canadian Northern Ry. and C.P.R. to operate trains over crossing in St. Boniface, Man., without first stopping.

21190. Jan. 12.—Authorizing Canadian Northern Ry. to open for traffic its revised line across Rainy Lake, Ont., from mileage 224.3 to 226.4.

21191. Jan. 9.—Approving location of C.P.R. Swift Current Northwesterly Line from mileage 169 to 175, and authorizing building of same across 7 highways in Alberta.

21192. Jan. 12.—Authorizing C.P.R. to open for traffic its third track from Queen St. subway to Royce Ave., Toronto.

21193. Jan. 10.—Extending to Mar. 15 time within which C.P.R. shall complete additional track to Dodge Manufacturing Co.'s siding, Toronto.

21194. Jan. 12.—Authorizing G.T.R. to build additional track across Inverness St., Caledonia, Ont.

21195. Jan. 9.—Authorizing G.T. Pacific Ry. to build bridge across Endako River, mileage 358 Prince Rupert East, B.C.

21196. Jan. 10.—Authorizing G.T.R. to rebuild bridge 48 over Black Creek, at milepost 120.21 from Black Rock, Downie Tp., Ont.

21197. Jan. 12.—Authorizing Sandwich, Windsor and Amherstburg Ry. and Canada Southern Ry. to operate over crossing of C.S.R. spur to Postum Cereal Co. of Canada, Windsor, Ont.

21198. Jan. 12.—Authorizing G.T. Pacific Ry. to build across and divert highways at mileage 461 and 357.3, Prince Rupert Easterly, B.C.

21199. Jan. 12.—Authorizing C.P.R. to build spur for J. I. Case Threshing Machine Co., Regina, Sask.

21200. Jan. 13.—Authorizing C.P.R. to open for traffic portion of double track from mileage 67.7 to 76.8, Moosejaw Subdivision, Sask.

21201. Jan. 13.—Authorizing C.P.R. to use bridges at Guy, Aqueduct and Mountain Sts., Montreal.

21202. Jan. 13.—Authorizing Canadian Northern Ry. to build across and divert public road on its Delisle Branch in n.e. ¼ Sec. 14-28-9, w. 3 m., Sask.

21203. Jan. 13.—Authorizing C. P. R. to use bridge on Decarie Ave., Montreal.

21204. Jan. 13.—Authorizing C.P.R. to build its Weyburn-Stirling Branch across 20 highways in Saskatchewan, mileage 299.145 to 316.765.

21205. Jan. 14.—Amending order 21114, Dec. 30, 1913, re crossing of highways by C.P.R. Bassano Easterly Branch in Alberta.

21206. Jan. 9.—Approving revised location of C.P.R. main line from mileage 125.14 to 126.76 (mileage 127 old line), and from mileage 129.83 to 131.65 (mileage 132.27 old line), through no. 28, Gallagher and Chapleau Tps., Ont.

21207. Jan. 9.—Authorizing G.T. Pacific Ry. to build bridge across Stoney Creek, mileage 397.1, Prince Rupert East, B.C.

21208. Jan. 14.—Authorizing G.T.R. to build siding for Plessisville Foundry Co., Plessisville, Que.

21209. Jan. 14.—Approving proposed Supplement 1 to Canadian Northern Ry. Standard Freight Mileage Tariff for its Eastern Lines, C.R.C., no. E 212.

21210. Jan. 15.—Amending order 18570, Jan. 24, 1913, re C.P.R. crossings of highways on its Swift Current Northwesterly Branch in Saskatchewan, and rescinding order 19037, Apr. 11, 1913, in same connection.

21211. Jan. 15.—Ordering C.P.R. to remove station at Kruezburg, Man., to road allowance at east end of yard.

21212. Jan. 15.—Approving Canadian Northern Ry. revised location, mileage 210.11 to 211.05, Rainy River District, Ont.

21213. Jan. 16.—Authorizing Canada Southern Ry. and G.T.R. to use crossing, Canadian Steel Foundries' siding, Crowland Tp., Ont.; trains to stop before crossing.

21214. Jan. 12.—Relieving C.P.R. from providing further protection at crossing of highway known as Cote du Sud, mileage 11 from Place Viger Station, Montreal.

21215. Jan. 16.—Authorizing C.P.R. to open for traffic portion of its double track from Waldeck to Eaman, mileage 99.4 to 109.4, Swift Current Subdivision, Sask.

21216. Jan. 8.—Amending order 21026, Dec. 15, 1913, re Canadian Northern Ry. spur for Thomson, McDougall & Co., Woodlands, Man.

21217. Jan. 16.—Rescinding order 19400, May 29, 1913, re exemption of C.N. Quebec Ry., from fencing portion of its right of way between mileage 23.5 and 34.

21218. Jan. 16.—Authorizing C.N. Alberta Ry. to build bridge across Stony River at mileage 209.3.

21219. Jan. 15.—Authorizing G.T.R. to operate trains over Confederation Construction Co.'s siding, near Merritton, Ont.

21220. Dec. 27.—Ordering G.T.R. to build for W. J. Watson, Glencoe, Ont., a farm crossing on Lot 9, Con. 2, Mosa Tp., Ont.

21221. Jan. 16.—Authorizing G.T.R. to build extension of siding for Empire Cotton Mills, Ltd., at Welland, Ont.

21222. Jan. 16.—Authorizing C.P.R. to build at grade, roadways across its main line at Cummings, Sask.

21223. Jan. 14.—Ordering C.P.R. by June 1 to install gates at crossing of First St., Souris, Man., to be operated by day and night watchman; 20% of cost to be paid out of the railway grade crossing fund, maintenance and operation to be paid by company.

21224. Jan. 12.—Amending order 19763, July 4, 1913, re G.T.R. and T.H. & B.R. siding to Steel Co. of Canada, Hamilton, Ont.

21225. Jan. 16.—Limiting speed of G.T. Pacific Ry. trains over crossing of Amelia St., Winnipeg, to 10 miles an hour.

21226. Jan. 19.—Authorizing C.P.R. to build road diversion and build its Swift Current Northwesterly Branch at grade across highway at mileage 43.42, between Secs. 17 and 18-20-19, w.3 m., Sask.

21227. Jan. 19.—Authorizing C.P.R. to open for traffic portion of its Weyburn Westerly Branch Line from Woodrow, mileage 145.7, to Shaunavon, mileage 230.8; speed of trains over first 62 miles limited to 18 miles an hour, and over remainder to 10 miles.

21228. Jan. 19.—Authorizing C.P.R. to build spur for Brandon Holding Co., Brandon, Man.

21229. Jan. 19.—Authorizing C.P.R. to use bridge 5.7, Kipawa Subdivision, Lake Superior Division, Ont.

21230. Jan. 10.—Ordering C.P.R. to install improved type of automatic bell at second crossing east of Green Valley, Ont., by June 1, and relieving it of speed limitation against westbound traffic over said crossing.

21231. Jan. 20.—Approving location of G.T. Pacific Ry. stations at Reba, Sowden and Unaka, Ont.

21232. Jan. 19.—Authorizing C.P.R. to build spur for H. Hope & Sons, Monoghan Tp., Ont.

21233. Jan. 20.—Rescinding order 20808, Nov. 13, 1913, authorizing Canadian Northern Ry. to divert Rue La Verandrye, St. Boniface, Man.

21234. Jan. 9.—Ordering Georgian Bay and Seaboard Ry. (C.P.R.) to deepen ditch and provide uniform grade from right of way to Scugog River, Ops Tp., Ont.

21235. Jan. 14.—Ordering C.N. Quebec Ry. to install gates at crossing of Cuvillier St., Hochelaga, Que., by July 1.

21236. Jan. 20.—Approving C.P.R. plan showing clearances at siding to Canadian Rolling Mills Co., Montreal.

21237. Jan. 19.—Authorizing C.P.R. to build spur for Gray-Campbell, Ltd., Winnipeg.

21238. Jan. 21.—Extending for six months from date time within which Esquimalt and Nanaimo Ry. shall file Standard Tariff of maximum freight tolls for approval.

21239. Jan. 21.—Authorizing G.T.R. to build extension to siding for Independent Rubber Co., Grantham Tp., Ont.

21240. Jan. 5.—Amending order 20816, Nov. 12, 1913, re removal of C.P.R. and Great Northwestern Telegraph Co. wires from certain streets in Berlin, Ont.

21241. Jan. 21.—Ordering C.P.R. to install automatic bell at crossing in Port Haney, B.C.; 20% of cost to be paid out of the railway grade crossing fund.

21242. Jan. 22.—Approving Kettle Valley Ry. location between mileage 38.96 and 49, west of Penticton, B.C.

General order 117. Jan. 8.—Regulations respecting table of graduated charges by express companies. Order given in full under "Among the Express Companies" on another page.

General order 118. Jan. 15.—Ordering railway companies to accept freight consigned "to order" for delivery at flag stations and determining regulations for delivery at such flag stations. This order is given in full on another page.

Canadian Pacific Railway Appropriations for Western Lines.

George Bury, Vice President, C.P.R., Winnipeg, visited Montreal early in January to confer with Sir Thomas Shaughnessy as to the appropriations for construction on the Western Lines during this year. On Jan. 8, the following official statement was given out for publication:—

"Discussions involving expenditures in the west by the C.P.R. have been carried on in Montreal during the past few days between Sir Thomas Shaughnessy and George Bury, with the result that appropriations have been passed. The position this year is somewhat different from that of former years. 1913 was a year when large and comprehensive schemes for extensions, betterments, and double tracking the system were pushed. These schemes cannot be completed in a day or two, and must be carried to a certain point before further extensions are undertaken, so that the expenditures estimated for in the western appropriations of 1914 are almost entirely confined for the present to the completion of track laying, etc., on grading already built, on branch lines, extensions, and double tracking, the latter of which will eventually connect Winnipeg with Vancouver, and to the building of Rogers Pass tunnel, which will be pushed with vigor. So far as grading is concerned, no less than 600 miles are now ready for the rails, and there is extensive terminal work at Winnipeg, Calgary and Vancouver, the completion of which has been provided for. The consideration of the expenditures on any new railway construction or other works will come up again later in the year, when further data have been secured, and there will then be another conference with the President.

"Mr. Bury, when interviewed, said that under the direction of Sir Thomas Shaughnessy, C.P.R. expenditures had always been directed in accordance with the actual exigencies of traffic and with the building up of the western country, and it was owing to this comprehensive policy that the C.P.R. in 1913 was able to move such a large grain traffic so expeditiously at a time when the great strain of moving the harvest came. The facilities provided in rolling stock were such that car requirements in other directions were able to be met promptly, and other traffic moved currently as well as the grain."

Upon his arrival at Winnipeg, Jan. 12, Mr. Bury added the following to the foregoing statement: "There are 600 miles of branch line extensions, practically ready for steel, as follows: Empress to Bassano, 140 miles; Kootenay Central, from Golden to Fort Steele, 70 miles; Monitor to Kerrobert, 75 miles; Alberta Central, west of Red Deer, 35 miles; Weyburn-Lethbridge line, west of Shaunavon, 90 miles; Gimli north, 26 miles; Suffield west, 30 miles; Coronation northwest, 45 miles. The mileage mentioned in connection with the above branch lines will all be completed this year and ready for operation. There is plenty of work to be done in double tracking, as there are 145 miles graded and ready for steel. There are 70 miles between Winnipeg and Calgary, and 75 miles on the British Columbia division.

Railway Rolling Stock Notes.

The Fessette Lumber Co. has ordered 10 logging cars from Canadian Car and Foundry Co.

The Dominion Coal Co. has ordered 25 wood hopper cars, 30,000 lbs. capacity, from Canadian Car and Foundry Co.

The Intercolonial Ry. has ordered 200 box cars, 80,000 lbs. capacity, from the Canadian Car and Foundry Co.

The Intercolonial Ry. has ordered 200 steel frame box cars, 80,000 lbs. capacity, from Canadian Car and Foundry Co.

The Grand Trunk Pacific Ry. has received 3 colonist cars, nos. 3040 to 3042, from the Canadian Car and Foundry Co.

The Eastern Car Co., up to Jan. 16, has delivered 1,281 steel underframe box cars, out of an order for 2,000, to the Grand Trunk Ry.

The Cape Breton Coal, Iron and Ry. Co. has ordered 20 steel hopper cars, 80,000 lbs. capacity, and 5 wood hopper cars, 30,000 lbs. capacity, from Canadian Car and Foundry Co.

The C.P.R., between Dec. 1 and 31, ordered 151 steel frame box cars, 35 stock cars and 4 vans, from its Angus Shops, and 15 tank cars from American Car and Foundry Co.

The Alberta Metropolitan Ry., which is building a short line to connect Calgary Jct. with the Calgary Municipal Ry., at Calgary, Alta., has not yet, we are officially advised, placed any orders for rolling stock.

The Confederation Construction Co., which has a contract on the Welland Ship Canal construction, has ordered another 4 wheel saddle tank locomotive from Canadian Locomotive Co., in addition to the one mentioned in our last issue.

The Canadian Northern Ry. has ordered 7 steel underframe first class cars, 5 steel underframe second class cars, and 40 all wood colonist cars, from Canadian Car and Foundry Co., and 15 colonist cars and 5 baggage cars, from Crossen Car Co.

The Board of Railway Commissioners has extended to June 30, the time within which the C.P.R. and the Dominion Atlantic Ry. shall equip their locomotives with ash pans that can be emptied without employes having to go underneath, except in cases of emergency.

The Canadian Northern Ry., between Dec. 13 and Jan. 13, received the following additions to rolling stock:—7 cabooses from its Winnipeg shops; 100 box cars from Canadian Car and Foundry Co.; 125 box cars from National Steel Car Co., and 100 flat cars, from Mount Vernon Car Manufacturing Co.

The Canadian Northern has ordered the following rolling stock,—7 steel underframe first class cars, 5 steel underframe second class cars and 40 all wood colonist cars, from Canadian Car and Foundry Co.; 15 all wood colonist cars and 5 baggage cars, from Crossen Car Co., and 8 baggage cars from Preston Car and Coach Co.

The Intercolonial Ry. has received the following additions to rolling stock:—11 box baggage cars, from its Moncton shops; 2 postal cars and 45 box bars, 60,000 lbs. capacity, from the Canadian Car and Foundry Co.; 4 Pacific locomotives, from the Montreal Locomotive Works; and 5 consolidation locomotives, from the Canadian Locomotive Co.

Sir William Mackenzie, President, Canadian Northern Ry., is reported to have stated recently that the company will make an immediate expenditure of about $10,000,000 for additional rolling stock for the line between Toronto and Port Arthur. The orders to be placed will cover locomotives, passenger cars, dining cars, sleeping cars and box cars.

The Canadian Northern will probably place considerable orders for locomotives and cars for both passenger and freight service, in the near future. The orders for the passenger equipment especially are likely to be large, in view of the intended opening for traffic of the line between Ottawa and Toronto, and also of the main line north of Lake Superior.

The G.T.R. has recently received, to Jan. 12, the following additions to rolling stock: —772 box cars from Canadian Car and Foundry Co.; 517 box cars, from Eastern Car Co.; 12 mikado locomotives, 63 in. wheel, from Montreal Locomotive Works; 1,596 box cars, from Western Steel Car and Foundry Co., and 523 gondola cars from Pressed Steel Car Co.

The G.T. Pacific Ry. rolling stock for which contracts were made for delivery during 1913, details of which have been given monthly in Canadian Railway and Marine World, included, 10 second class cars and 5 colonist cars, from Canadian Car and Foundry Co.; 15 sleeping cars, 6 parlor-cafe cars, 6 dining cars, 5 tourist cars, 10 colonist cars and 10 first class cars, from Pullman Co.; 15 express cars and 14 mail and express cars, from Osgood Bradley Car Co.

The C.P.R., between Dec. 1 and 31, received the following additions to rolling stock:—109 steel frame box cars, 9 single track snow ploughs, 1 single track flanger, 5 double track flangers, 3 wedge ploughs, 2 class U3 locomotives, and 1 class D4 locomotive, from its Angus Shops; 3 single track snow ploughs and 9 double track snow ploughs, from Canadian Car and Foundry Co.; 4 class D10 locomotives, from Canadian Locomotive Co.; 3 class N3 locomotives from Canadian Allis-Chalmers, Ltd.; and 15 tank cars from American Car and Foundry Co.

The two motor cars which the Pacific Great Eastern Ry. has placed in service on its line in the neighborhood of North Vancouver, are similar in type to those in use on the Southern Pacific Rd. in California. They are divided into four compartments, and are of the usual railway style. The engine is six cylinder and of about 150 h.p., developing a speed of 50 miles an hour. They are finished in mahogany, with floors of maple. Separate compartments are provided for smokers, and baggage, the seats are upholstered in rattan, and the cars are heated by steam.

The G.T.R. has ordered the following additions to rolling stock:—40 steel underframe first class cars, and 15 steel underframe suburban cars, from Canadian Car and Foundry Co.; 5 all steel postal cars, from Pressed Steel Car Co.; 4 steel underframe dining cars and 5 steel underframe parlor cars, from Pullman Co.; 10 steel underframe first class cars and 5 steel underframe combination second class and baggage cars, from American Car and Foundry Co.; 17 steel underframe first class cars, 10 steel underframe baggage cars and 5 steel underframe express cars, from Osgood Bradley Car Co.; 200 steel flat cars, 100,000 lbs. capacity, and 300 steel flat cars, 80,000 lbs. capacity, from Western Steel Car and Foundry Co.

In locomotive construction, the noticeable developments in 1913 were the increased use of superheaters and the tendency to regard the simple, superheated locomotive as the best all round machine for future use. Great interest was aroused by the production in Europe of the first Diesel engine locomotive, a powerful engine, built for express service, containing a driving engine coupled to the driving axles, and an auxiliary engine working independently of these. The trials are being carried out, and it is said that the locomotive has fulfilled all expectations as to its hauling ability. It is too early, however, to make any definite statement as to the permanent usefulness of this type. With the increasing size of the locomotive has come a corresponding demand for mechanical stoking, the work of feeding the fuel to the huge modern boilers being more than one man can accomplish. Several types are being tried and in some cases good results have been secured. Undoubtedly, mechanical stoking has come to stay.

J. D. McArthur and Co., contractors, Dominion Government railway to Hudson Bay, have ordered four mogul locomotives from Canadian Locomotive Co., and not six, as reported in our last issue. Following are the chief details:—

Weight in working order	112,800 lbs.
Weight, total	129,500 lbs.
Wheel base, rigid	12 ft. 6 ins.
Wheel base, total	20 ft. 6½ ins.
Wheel base, engine and tender	49 ft. 3¾ ins.
Heating surface, firebox	133 sq. ft.
Heating surface, tubes	1,301 sq. ft.
Heating surface, total	1,434 sq. ft.
Driving wheels, diar.	50 ins.
Driving wheels, centres	Cast iron
Driving journals, diar. and length	8½ by 12 ins.
Cylinders, diar. and stroke	19 by 26 ins.
Boiler, type	Extended wagon top
Boiler, pressure	180 lbs.
Tubes, no. and diar.	240—2 ins.
Tubes, length	10 ft. 5¼ ins.
Brakes	Westinghouse
Weight of tender, loaded	115,400 lbs.
Capacity, water	5,000 imp. galls.
Capacity, coal	9 tons
Tank	U shape
Truck, type	4 wheeled, arch bar
Wheels, diar.	33 ins.
Wheel, type	Cast iron
Journals	5 by 9 ins.
Brake beams	Steel

The G.T.R., during a portion of 1912, and in 1913, contracted for the following rolling stock, for delivery during 1913. All of the equipment mentioned has been dealt with in Canadian Railway and Marine World, from month to month, and practically the whole of it was delivered during the past year. From Montreal Locomotive Works, 41 superheater Pacific locomotives and 50 mikado locomotives; from Canadian Locomotive Co., 15 switching locomotives; from American Locomotive Co., 25 mikado locomotives; from Baldwin Locomotive Works, 50 mikado locomotives; from Canadian Car and Foundry Co., 2,000 forty ton box cars; from Eastern Car Co., 2,000 forty ton box cars; from Pressed Steel Car Co., 2,000 thirty ton box cars and 1,000 fifty ton gondola cars; from Western Steel Car and Foundry Co., 3,000 forty ton box cars. During 1913, the following rolling stock was ordered, for delivery during 1914, all of which has also been previously mentioned. From Canadian Car and Foundry Co., 40 first class cars and 15 suburban cars; from National Steel Car Co., 10 baggage cars, and 500 stock cars; from American Car and Foundry Co., 5 postal cars, 10 first class cars and 5 second class and baggage cars; from Pressed Steel Car Co., 5 postal cars; from Pullman Co., 4 dining cars and 5 parlor cars; from Osgood Bradley Car Co., 17 first class cars, 10 baggage cars and 5 express cars; from Western Steel Car and Foundry Co., 200 fifty ton flat cars and 300 forty ton flat cars.

False Bills of Lading.—The Quebec Legislature has under consideration a bill to amend the Railway Act, by providing for the imposition of a penalty not exceeding $1,000 on shippers making false bills of lading in order to secure lower rates for merchandise.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.— A start was made with the construction of the A. and G.W. Ry., under the new conditions, Jan. 3, when J. L. Coles, M.L.A., turned the first shovelful of earth for the building of the short piece of line which is to connect the Edmonton, Dunvegan and British Columbia Ry. with the right of way secured and partially graded by the old A. & G.W. Co. This junction point is at Carbondale, about two miles north of Sturgeon River, and 12 miles out of Edmonton, on the E.D. and B.C. Ry. A large gang is being set to work clearing up the right of way, and doing other work preparatory to the starting of grading in the spring. W. R. Smith is Chief Engineer of this line, as well as of the E.D. and B.C. Ry., and construction will be done by J. D. McArthur. (Jan., pg. 21.)

The Alberta Metropolitan Ry. is owned by the interests which own the Dominion Co-operative N.T. and Realty Co., Calgary, the officers and directors of which are:—President and Manager, W. J. C. Madden, Calgary, Alta.; Vice President, W. H. Clipperton, Toronto; Secretary-Treasurer, E. P. Maden, Calgary. The A.M. Ry. has power to build lines in and around Calgary, and is engaged in building a line from Calgary Jct. to a junction with the Calgary Municipal Ry. It is reported that at Dec. 31, 1913, about four miles of grading had been completed, and that it was expected to have the line in operation by July. The controlling company is engaged in the real estate business, and operates general stores on the land it is opening up for settlement. (Jan., pg. 21.)

Algoma Eastern Ry.—A regular train service has been put on the extension to Little Current, Manitoulin Island, Ont., the Board of Railway Commissioners having authorized operation over the bridge between Goat Island and Manitoulin Island, and on the spur to Little Current. (Oct., 1913, pg. 475.)

Bruce Peninsula Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway, to be operated by steam, electricity or other motive power, from Wiarton, northerly to Tobermory, Bruce County, Ont., with branch lines. Power is also asked to operate steamboats and car ferries. E. C Spearman, Owen Sound, Ont., solicitor for the applicants.

Burrard Inlet Tunnel and Bridge Co.—The directors decided, Dec. 30, to invite tenders for the building of a bridge across the Second Narrows of Burrard Inlet, Vancouver, B.C., on plans prepared by Sir John Barry, London, Eng., at an estimated cost of $2,225,000. Tenders will be received up to April 1. The company is formed of representatives of the cities of Vancouver and North Vancouver, and the municipal districts of North and West Vancouver, which have subscribed $750,000 towards the erection of the bridge. The Dominion Government has promised $350,000, and the British Columbia Legislature has voted $400,000. The company is now asking the British Columbia Legislature to guarantee a bond issue of $750,000.

The structure will be of steel with wide spans 45 ft. above high water level, and will be supported on six piers founded on rock. The draw span will measure 581½ ft. in length from centre to centre, and will revolve on a platform supported by four wrought steel cylinders, braced together and filled with concrete. The fixed spans will be 232 ft. long. It will cross the Narrows at an angle of 75 degrees to the average direction of the flood and the currents, which at that point are very powerful. A channel with an average minimum depth of 35 ft. will be provided at the draw span. The floor will be 64 ft. 5½ ins. wide, on which will be laid a single track railway, a double track for street railway traffic, and an 8 ft. sidewalk. The approaches will be on easy gradients.

The Board of Railway Commissioners has approved location plan of the connecting line from Vancouver from station 0 to station 130-03.6, on the south shore of Burrard Inlet. (Jan., pg. 21.)

Calgary and Fernie Ry.—The Dominion Parliament is being asked to extend the time for the construction of this projected railway in Alberta and British Columbia; to change the head office from Fernie to Calgary, Alta.; to increase the bonding powers to $60,000 a mile; and to authorize the company to enter into agreements with the High River and Hudson Bay Ry., the High River, Saskatchewan and Hudson Bay Ry., the Canadian Western Ry., the Canadian Northern Ry., the Grand Trunk Pacific Ry., or the Hudson Bay Ry. Hough, Campbell and Ferguson, Winnipeg, solicitors for company. (July, 1913, pg. 331.)

Calgary and Knee Hill Ry.—Local press reports state that engineers are locating a line from Acme along the Knee Hill Creek, Alta., to reach some coalfields in which it is stated the C.P.R. is interested. It is further stated that an endeavor will be made to secure a subsidy for the line under the terms of the act granting aid towards the construction of light railways, passed last session of the Alberta Legislature. (Aug., 1909, pg. 573.)

Cape Breton Ry.—See Inverness and Richmond Ry.

Delaware and Hudson Co.—We are officially advised that the company does not contemplate building any additions or extensions of its lines in Canada—the Quebec, Montreal and Southern Ry., and the Napierville Jct. Ry.—in the near future. (Oct., 1913, pg. 475.)

Dominion Atlantic Ry.—The Board of Railway Commissioners has authorized the opening for traffic of a portion of the grade revision from St. George St., Annapolis Royal, N.S., westerly to Allan's Creek, 2,792½ ft. (Jan., pg. 21.)

Edmonton, Dunvegan and British Columbia Ry.—Track has been laid to mileage 131 from Edmonton, of which 106 miles were laid during 1913. A construction train service is being operated to Mirror Landing, Athabasca Lake, Alta. W. R. Smith, Edmonton, Alta., is Chief Engineer. (Jan., pg. 21.)

Erie and Ontario Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway, to be operated by steam, electricity, or any other motive power, from Port Maitland, on Lake Erie, to Smithville, in Lincoln county, Ont., and from Port Maitland to Port Colborne, Welland county, Ont., with branch lines. Power is also asked to operate vessels in connection with the railway. W. T. Henderson, Brantford, Ont., solicitor for applicants.

Glengarry and Stormont Ry.—The ratepayers of Cornwall, Ont., have approved of a bylaw granting a bonus of $5,000 to aid in building a railway from the C.P.R. at St. Polycarpe, Que., to Sidney and Sixth Streets, Cornwall, Ont., to be paid on the completion of the line.

C. L. Hervey, who is the principal promoter of the line, is also engaged in promoting a line from Cornwall to Hawkesbury, where a junction would be effected with the projected Calumet and Northern Ry., for the construction of which a separate charter may be procured.

High River, Alta., to Hudson Bay.—Press reports state that engineers are making surveys in the High River Valley district, through the Okotoks and Black Diamond oil fields. The engineers are said to be working at present east and west of the High Wood Falls at the foot of the Rocky Mountains, west of High River. There are two charters covering the construction of a railway in this district—the High River and Hudson Bay Ry., and the High River, Saskatchewan and Hudson Bay Ry. (See under these headings, April, 1913, pg. 169, and Feb., 1912, pg. 67.)

Intercolonial Ry.—A contract is reported to have been let to the Union Construction Co., North Sydney, N.S., for building a diversion of the line from North Sydney to Leitche's Creek, 4.3 miles. The cost is estimated at $67,571.

Considerable extensions are being made to the yards at Amherst, N.S. It is said that the locomotive house is to be moved further to the west, so as to provide additional yard room. (Jan., pg. 18.)

Inverness Ry. & Coal Co.—Press reports fom Sydney, N.S., Jan. 7, state that negotiations are in progress for connecting this line either with the Cape Breton Ry., now in operation from Point Tupper to St. Peters, N.S., or with an extension of the same from St. Peters to Sydney. The report also adds that the Cape Breton Ry. is to be acquired by Mackenzie, Mann & Co. interests, which own the I. R. and Coal Co., prior to the extensions being made.

Lake Erie and Northern Ry.—Application is being made to the Dominion Parliament to increase the company's bonding powers from $30,000 to $45,000 a mile, and authorizing the borrowing of money for "the acquisition, construction, extension or development of any property, assets or works other than the railway."

There is no truth in the report, officials of the company in Brantford state, that the company's franchise has been acquired by the C.P.R. The line was projected, according to the company's prospectus, to give connection to the various municipalities with the C.P.R. at Galt.

Construction on the line is suspended, but it is expected that the contractors will start work again early in March. (Jan., pg. 21.)

Michigan Central Rd.—The opening of the new station at Detroit, Mich., scheduled for Jan. 4, had to be advanced on account of a fire, Dec. 26, 1913, which destroyed the old station. The new terminal was therefore put into service on the evening of Dec. 26. It is located at Fifteenth St., 1½ miles west of the old station at Third Street, and is a combined station and office building 17 stories high, faced with limestone, brick and terra cotta. It is of the through type, with 11 tracks protected by a Bush trainshed. Three subways pass under the tracks and platforms, two of which have connections by stairway or elevator with each platform. The new terminal is part of the Detroit River tunnel improvement, and was built by the Detroit River Tunnel Co., a subsidiary of the M.C.R. The entire project involved extensive rearrangement of track facilities. (July, 1913, pg. 575.)

Newfoundland Ry. and Train Ferry Syndicate, Ltd., has been registered in England, as a private company with £1,000 capital,

and with no power to increase it, to acquire the benefits of a concession or agreement contained in two letters from the Colonial Secretary to the Newfoundland Government, authorizing the construction, equipment and operation of a railway from Southwest Arm, Green Bay, to Humber Mouth, Bay of Islands, and to adopt an agreement with H. C. Thompson. The permanent directors are, Scott Lings, H. C. Thomson and T. L. Gilmour, and the registered office is at 13 Austin Friars, London, E. C.

Norfolk and Elgin Ry.—The Dominion Parliament is being asked to incorporate a company with this title to build a railway to be operated by steam, electricity, or any other motive power, from Simcoe, via Bayham, to Port Burwell, Ont., with branches. Power is also asked to operate car ferries to U.S. ports. Price, Garvey & Co., Toronto solicitors for applicants.

North Ry.—The surveys for this projected line between Montreal and the National Transcontinental Ry., at Belle River, Que., are reported to have been completed between Calumet and Belle River, 170 miles. It is also reported that construction will be started in the spring. The route adopted will, it is said, give as favorable gradients as the National Transcontinental Ry. has. Application is being made to the Dominion Government for a renewal of the subsidies for the construction of the entire line from Montreal to Hudson Bay. (Oct., 1913, pg. 475.)

Northern Territorial Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of the line from Fort Churchill, Hudson Bay, westerly to Port Essington, B. C., authorized to be built by chap. 125 of the statutes of 1912. (Dec., 1912, pg. 605.)

Pacific Great Eastern Ry.—We are officially advised that track has been laid on the section between Vancouver and Newport, B.C., about 42 miles, from North Vancouver to Dundarave, 4.5 miles, and on the section between Newport and Clinton, 168.5 miles from Newport to Cheakamus, 13.5 miles. Construction is being carried on upon the untracked mileage on these two sections by P. Welch, the contractor. Surveys are being proceeded with on the remaining section of the line from Clinton to a junction with the Grand Trunk Pacific Ry. at Fort George, B.C., 261 miles.

A train service was put in operation between North Vancouver and Dundarave, Jan. 1. Considerable progress has been made with grading between Dundarave and Caulfields, to which place the company is under agreement to have a train service in operation by July 1.

The Squamish Indian Reserve of 1,098 acres, at Newport, has been formally transferred to the company. The purchase price was $175,000. It will be used for terminal purposes. (Jan., pg. 22.)

Prince Edward Island Ry.—We are officially advised that surveys are in progress for a branch from mileage 40.8 to Carter's Point, near Cape Traverse, P.E.I., three miles. This will be the permanent line to the car ferry terminal now under construction. (Jan., pg. 22.)

Quebec Central Ry.—We are officially advised that surveys are being made for an extension of the line now terminating at St. Camille, Bellechasse county, Que., to English Lake, Montmagny county, 20 miles. (Dec., 1913, pg. 575.)

Queen Charlotte Islands.—Portland, Ore., press reports state that plans have been prepared in that city by men interested in the development of some oil bearing lands on Queen Charlotte Islands, B.C., for the building of a six mile railway from Rennell Sound, on the northwest of Graham Island, northerly. (See Queen Charlotte Island Ry., pg. 353; Graham Island Ry., pg. 351, and Island Valley Ry., pg. 351, all Feb., 1910.)

Reid Newfoundland Ry.—At the close of 1913, the company had laid 74 miles of track on the new branch lines under construction, as follows—Trepassey Branch, between Biscay Bay and Trepassey, 5.00 miles; Carbonear Branch, between Carbonear and Bay de Verde, 53.00 miles; Fortune Bay Branch, between Goobies and Black River, 15.00 miles; Heart's Content extension into Heart's Content, 1.00 mile. The Trepassey Branch is now completed, with the exception of the finishing up process, as also is the Carbonear Branch; some grading has been done at Black River on the Fortune Bay Branch, and the Heart's Content Branch has been completed. Some miles of grading have been done on the Bonne Bay Branch. (July, 1913, pg. 332.)

St. John and Quebec Ry.—During 1913, track was laid on 92 miles of the line known as the St. John Valley Ry., but covered by the general charter of the St. J. and Q. Ry. Track is laid from Gagetown to 18 miles north of Fredericton, N.B., 47 miles. Between this point and 21 miles south of Woodstock, 23 miles, grading is well advanced, the contract being carried out by the Hubbard Construction Co., Fredericton. From 21 miles south of Woodstock, to 24 miles north of that town, 45 miles, track has been laid, and 1.5 miles of grading is being completed to Centerville, by Kennedy and McDonald, Woodstock, N.B. Surveys for the line from Gagetown to St. John, 50 miles, and from Centerville to Andover, 26 miles, are not finally completed. The total length of the line from St. John to Andover will be 192.5 miles.

The Maine Legislature has incorporated the Quebec Extension Ry. Co., to build a line from Caribou, near Presque Isle, Me., to the International boundary near Megantic Que. A. R. Gould, President, St. John and Quebec Ry., is the principal promoter of the line, and he is reported to have stated that it is projected as part of the St. J. and Q. Ry. It is said that the line will ultimately be operated by electricity, obtained from water powers to be developed at various points on the route. (Dec., 1913, pg. 575.)

Timiskaming and Northern Ontario Ry.—A revision of the line from mileage 250 to Cochrane, Ont., 2.8 miles is, we are advised, being made, the contract having been let to Macdougall and McCluskey, Cochrane, Ont. W. B. Clement, North Bay, Ont., is Chief Engineer.

A two stall locomotive house is under construction at Elk Lake, the terminus of the Elk Lake Branch. (Dec., 1913, pg. 575.)

Toronto, Hamilton and Buffalo Ry.—The railway situation at Hamilton, Ont., is at present in an interesting situation, brought about by the proposed entry of the Canadian Northern Ry., and the suggested abolition of level crossings on the T. H. and B. Ry. The latter company wishes to elevate the existing line, and the C.N.R. has surveyed a route entering the city limits near the G.T.R., south of that line, but crossing it east of the Stuart St. station, and paralleling the old Northern and Northwestern Ry. from Gage Ave. to the city boundary. The city is desirous of having all the railways passing through the city restricted to one right of way, and the Board of Railway Commissioners has recently decided that it has power to change the location of any line, when it is in the public interest to do so. The plan suggested by the city is that the C.N.R. from Toronto should connect with the G.T.R. near Desjardins Canal, at which point the T. H. and B. R. has also a connection, and that the G.T.R. right of way from that point, which is 120 ft. wide, should be followed to the Hamilton Jockey Club's grounds, where the lines would diverge, the C.N.R. keeping to the north, and the T. H. and B. R. bending southerly, each to tie into its route outside the city, the T. H. and B. R. joining its present line east of Bartonville. The city also suggests that the companies provide a union station at the corner of James and Stuart Streets, about two blocks east of the present G.T.R. station. (Jan., pg. 22.)

Western Canada Power Co.—We are officially advised that the company has completed an extension of its line from Stave Falls to Stave Falls dam, near Vancouver, B.C., 0.5 mile. This is a construction line only. The company holds charters to build electric railways, under the title of the Burrard, Westminster Boundary Ry. and Navigation Co.

Western Central Ry.—The Dominion Parliament is being asked to extend the time for the building of this projected railway. Mowat, Langton and Maclennan, Toronto, solicitors for applicants.

Winnipeg, Man.—The Commissioners for the Greater Winnipeg Water District have let a contract to O'Brien, Fowler and McDougall Bros. for the supply of 400,000 ties for the construction railway to be built from Winnipeg to Shoal Lake, Man., in connection with the new water supply proposals.

We are officially advised by the Commissioners that the location of the railway and pipe line have not yet been completed The preliminary surveys show that there will be about 35 miles of prairie work with a minimum of grading; the remaining 50 miles will be through a sparsely wooded country, with some muskeg but very little rock. It is merely a construction line, and as it will probably not be operated after the completion of the pipe line, the grading will be very light, and there will be very little curvature. It is expected to use 65 lb. rails. It is expected to let a contract for the line in March, but it has not yet been decided whether the Commissioners will build and operate the line, or whether the entire work in connection with the water supply will be let as one job. (Dec., 1913, pg. 575.)

Dominion Government Railway to Hudson Bay.

We are officially advised that track was laid to Dec. 31, 1913, from Pas, Man., for 86 miles. The line is under construction from this point to Port Nelson, on Hudson Bay, 337 miles.

J. D. McArthur, Winnipeg, the general contractor, was in Ottawa, Jan. 9, and is reported to have stated that grading and rock work will be carried on all winter, and that ties and steel are being taken in for the tracklaying during the summer. Over 1,000 men are in the camps.

A report was issued by the Naval Service Department at Ottawa, Jan. 12, respecting Hudson Bay. According to this report navigation is possible to and from James Bay, from July 15 to Nov. 15. Winter conditions generally prevail to the end of June, and navigation is sufficiently safe by the middle of July. The report also deals with conditions in James Bay, which is reported to be navigable from August to the end of November. There is a suitable location for a harbor at Comfort Point, at the east end of Ministikiwatin, on Rupert's Bay. It is a point in this bay which has been suggested as a terminal for grain carriers, crossing from Port Nelson, and transferring the grain to a railway running to Montreal or other points. It is in connection with this project that the North Ry. is being surveyed. (Dec., 1913, pg. 582.)

Steam Railway Track Laid in 1913.

Following the annual custom of many years, circulars were sent in December by Canadian Railway and Marine World to all steam railways in Canada, asking information as to new track built in 1913. Particulars of the replies received were published in our January issue, but by a typographical error the total of new single track was given as 3,344.50 miles instead of 3,144.50 miles as the detailed figures showed. A number of revised figures and additions have since been received, which brings the total mileage laid up to 3,213.67 miles, against 2,179.09 laid in 1912.

Following are the revised details:

	Miles.	Miles.
Algoma Central Ry.—		
Oba to Hearst, Ont.		49.00
Algoma Eastern Ry.—		
Mileage 79 to Little Current, Ont.		6.57
Canadian Northern Ontario Ry.—		
Between Montreal and Hawkesbury	10.00	
Between Ottawa and Capreol	120.00	
Between Ruel and Port Arthur	406.00	
Between Sydenham and Ottawa	54.00	
		590.00
Canadian Northern Ry.—		
Manitoba—		
Winnipeg	3.34	
Deerfield spur	12.50	
Greenway extension	15.33	
Grosse Isle extension	22.80	
Oakland extension	11.69	
Saskatchewan—		
Goose Lake branch	25.78	
Jackfish line	17.10	
Macrorie east	8.59	
Macrorie west	31.57	
Moose Jaw line	1.85	
Prince Albert-Battleford	51.95	
Swift Current line	55.85	
Alberta—		
Main line	148.31	
Vegreville-Calgary	13.20	
Strathcona-Camrose	0.17	
Brazeau line	42.60	
Peace River line	30.65	
Strathcona-Calgary	1.28	
		494.56
Canadian Northern Pacific Ry.—		
Yellowhead westerly	6.07	
Cisco to Hope	62.00	
Portions between steel bridges, Cisco to Kamloops	9.00	
Cottonwood to Kamloops	123.00	
New Westminster to Steveston	12.00	
		212.07
Canadian Pacific Ry.—		
Interprovincial and James Bay Ry., Lumsden's Mills to Opemican, Que.		10.00
Campbellford, Lake Ontario and Western Ry., Glen Tay to Agincourt, Ont.		182.60
Manitoba—		
Snowflake west	10.00	
Virden-McAulay line	23.00	
Boissevain-Lauder line	35.00	
Saskatchewan—		
Estevan north west	47.00	
Kerrobert north east	22.00	
Swift Current-Bassano	60.80	
Weyburn-Stirling line	162.00	
Alberta—		
Suffield south west	32.30	
Gleichen-Shepard	25.00	
*Alberta Central	40.00	
Lacombe branch extension	8.00	
British Columbia—		
Kootenay Central extension	19.70	
Whitewater to Kaslo	16.00	
		693.40
Dominion Government Ry.—		
To Hudson Bay Pass and mileage 86, Man.		86.00
Esquimalt and Nanaimo Ry.—		
McBride Jct. to Big Qualicum	15.80	
Osborne Bay Jct. to Crofton	3.20	
		19.00
Edmonton, Dunvegan and B.C. Ry.—		
Mileage 23 to Mirror Landing, Alta.		106.00
Fredericton and Grand Lake Coal and Ry. Co.—		
Mileage 11 to 24, N.B.	13.00	
Marysville Jct. to Marysville	2.84	
		15.84
Grand Trunk Pacific Ry.—		
Regina-Boundary line, m. 92 to 155.	63.00	
Regina-Moose Jaw branch	92.00	
Prince Albert branch, m. 67 to 90	23.00	
Biggar-Calgary branch, m. 36.6 to 104.6	68.00	
Battleford to Rossman, Sask.	35.00	
Irricana to Calgary	33.00	
Balsam to Mount Park	31.00	
Main line, Beamont, B.C., easterly	120.00	
Main line, Tete Jaune Cache west	165.00	
		630.00
Intercolonial Ry.—		
Georges River to Sydney Mines		9.80
***Kettle Valley Lines—**		
On several sections		75.00
National Transcontinental Ry.—		
In Province of Quebec	88.26	
In Province of Manitoba	2.22	
		90.48
***Pacific Great Eastern Ry.—**		
North Vancouver to Dundarave	4.50	
Newport to Cheakamus, B.C.	13.50	
		18.00
Quebec Central Ry.—		
St. Sabine to St. Camille		5.00
St. John and Quebec Ry.—		
Gagetown to Fredericton, N.B.	29.00	
Fredericton northerly	18.00	
Mileage 21 south of Woodstock to Woodstock, N.B.	21.00	
Woodstock northerly	24.00	
		92.00
Sydney and Louisburg Ry.—		
Morien Jct. to Morien, N.S.	2.00	
Waterford Lake to Colliery 17	1.00	
		3.00
Timiskaming and Northern Ontario Ry.—		
Montreal River to Elk Lake, Ont.	6.00	
Iroquois Jct. to Iroquois Falls	6.40	
		12.40
Vancouver, Victoria and Eastern Ry.—		
Kilgard to Sumas Landing		5.05
Western Canada Power Co.—		
Extension to dam at Stave Falls, B.C.		0.50
Total		3,213.67

Of this mileage 2,710.51 miles were laid in connection with three systems, the following being the comparison of the mileages laid by the same systems in 1912:—

	1913. Miles.	1912. Miles.
Canadian Northern Ontario	590.00	195.00
Canadian Northern Pacific	212.07	41.75
Canadian Northern Ry.	494.56	303.63
	1,296.63	540.38
Canadian Pacific Ry.	693.40	353.79
National Transcontinental Ry.	90.48	361.15
G.T. Pacific Ry.	630.00	608.75
	720.48	969.90
Total of the three systems	2,710.51	1,864.07

The reduced mileage of track laid on the National Transcontinental Ry. is owing to the fact that tracklaying on the entire line from Moncton to Winnipeg, 1,804 miles, is now completed.

Divided by provinces the track laid in 1912 and 1913 compares as follows:—

	1913. Miles.	1912. Miles.
Prince Edward Island	—	9.90
Nova Scotia	12.80	9.69
New Brunswick	107.84	26.61
Quebec	103.26	125.25
Ontario	840.57	592.02
Manitoba	221.88	14.62
Saskatchewan	765.49	501.94
Alberta	511.51	554.72
British Columbia	650.32	331.34
Total	3,213.67	2,179.09

The following single track was laid in Newfoundland by the Reid Newfoundland Co.:—

	Miles.
Carbonear to Bay-de-Verde	53
Goobies to Black River	15
Biscay Bay to Trepassey	5
Into Heart's Content	1
	74

In addition to the above new lines the C.P.R. laid second track as follows:

	Miles.	Miles
*Quebec—Farnham section	3.00	
Ontario—Islington to Guelph Jct.	29.00	
Manitoba—Bergen north east	20.00	
Manitoba—Kemnay-Virden	35.00	
Saskatchewan—Whitewood-Grenfell	8.00	
Saskatchewan—Indian Head-Regina	21.60	
Saskatchewan—Regina-Pasqua	12.00	
Saskatchewan—Caron-Java	66.70	
British Columbia—Ruby Creek to Hammond	59.00	
		254.30

toria and Eastern Ry. 7.12 miles from Ardley to Still Creek, B.C., making a total of 267 miles of second track laid during 1913.

On the Minneapolis, St. Paul and Sault Ste. Marie Ry., a C.P.R. subsidiary line in the United States, 97.35 miles of track was laid as follows:—

	Miles.
Ambrose, N.D., to Whitetail, Mont.	85.78
Ironhub, Iron Mountain, Minn.	8.21
Range Jct. to Riverton, Minn.	3.36
Total	97.35

The Detroit and Huron Ry., a subsidiary of the G.T.R. in the United States, laid 14.50 miles of track, from near Cass City, to Bad Axe, Mich., 14.25 miles, and from West Bay City to Bay City Terminal, Mich., 1.25 miles.

Passenger Rate Meetings at Buffalo.

The annual meetings of the International Water Lines Passenger Association, the Niagara Frontier Summer Rate Committee, and the Great Lakes and St. Lawrence River Rate Committee were held at Buffalo, N.Y., in January. The rate representatives met on Jan. 20 and 21, and prepared the rates for submission to the general meetings of the three associations.

At the International Water Lines Passenger Association meeting, Jan. 21, a gavel, made from mahogany from the Northern Navigation Co.'s s.s. Noronic and bound with silver, was presented to the retiring chairman, G. C. Wells, Assistant to Passenger Traffic Manager, C.P.R. The following officers were elected for the current year:—President, O. H. Taylor, P.T.M., Eastern Steamship Corporation, New York; Vice President, W. P. Hinton, G.P.A., Grand Trunk Pacific Ry., Winnipeg; Secretary, M. R. Nelson, C.C.P.D., Northern Steamship Co., New York.

At the Niagara Frontier Summer Rate Committee's meeting, Jan. 22, F. T. Grant, G.P.A., Rutland Rd., Rutland, Vt., was elected Chairman for the current year. The retiring chairman, W. S. Cookson, A.G.P.A., Grand Trunk Ry., Montreal, was presented with a gavel, the wooden portion of which was made from a piece of quartered oak taken from the Chateau Laurier, the G.T.R. hotel at Ottawa. The silver used for its ornamentation was secured from Cobalt, Ont. Imbedded in the head of the gavel is a section of U rail taken from what is probably the last piece of rail in existence which was laid on the G.T.R. in 1854. This rail was of a remarkably good quality of iron and was made by the Ebbw Vale Co. in Wales. The joints were known as chair joints, as there were no fish plates in use at that time. The rail was laid for 1,000 miles between 1854 and 1857, and the quality was so good that the rails wore away very evenly, some lasting for 18 years. The line at that time was known as the Atlantic and St. Lawrence Rd. The case in which the gavel was placed was made from wood taken from the G.T.R. central station at Ottawa.

The Great Lakes and St. Lawrence River Rate Committee met Jan. 22, and elected W. F. Herman, G.P.A., Cleveland and Buffalo Transit Co., Cleveland, Ohio, as Chairman for the current year.

The next meetings of all three associations will be held in Toronto in January, 1915.

Western Canada Railway Club.—At the monthly meeting, Jan. 12, D. R. Dover, Local Freight Agent, G.T. Pacific Ry., read a paper on "new credit system."

The C. P. R. is reported to have ordered 100,000 tons of steel rails from Algoma Steel Corporation, and 25,000 tons from Dominion Iron and Steel Co.

Birthdays of Transportation Men in February.

Many happy returns of the day to:—

S. A. Baker, Canadian Freight and Passenger Agent, Chicago Great Western Rd., Toronto, born at Morrisburg, Ont., Feb. 1, 1877.

B. H. Bennett, General Agent, Chicago and North Western Ry., Toronto, born at Cobourg, Ont., Feb. 6, 1858.

F. L. C. Bond, Division Engineer, Eastern Lines, G.T.R., Montreal, born there Feb. 21, 1877.

C. H. Booth, Local Freight Agent, Midland Ry. of Manitoba, Winnipeg, born at Banff, Scotland, Feb. 16, 1882.

T. Britt, General Fuel Agent, C.P.R., Montreal, born there Feb. 3, 1871.

G. E. Bunting, General Western Freight Agent, Allan Line Steamships, and Manager, Allan and Co., Chicago, Ill., born at Toronto, Feb. 8, 1873.

H. R. Charlton, General Advertising Agent, G.T.R. and G.T.P.R., Montreal, born at St. Johns, Que., Feb. 9, 1866.

R. Colclough, Superintendent, Intercolonial Ry., Levis, Que., born at Bic, Que., Feb. 24, 1871.

F. W. Cooper, A.M. Can. Soc. C.E., Division Engineer, C.P.R., Montreal, born at London, Ont., Feb. 16, 1880.

R. Crawford, Northwest Agent, Northern Navigation Co., Winnipeg, Man., born at Kingston, Ont., Feb. 21, 1870.

R. W. Drew, Division Freight Agent, Kootenay and Boundary Divisions, C.P.R., Nelson, B.C., born at Kingston, Ont., Feb. 17, 1874.

E. A. Evans, M. Can. Soc. C.E., ex-General Manager and Chief Engineer, Quebec Ry., Light and Power Co., Quebec, born at Kensington, London, England, Feb. 26, 1855.

L. O. Genest, General Storekeeper, Western Lines, C.P.R., Winnipeg, born at St. Henri, Levis County, Que., Feb. 16, 1856.

J. H. Guess, General Purchasing Agent, Grand Trunk Ry., Montreal, born at Raleigh, N.C., Feb. 5, 1878.

J. C. Holden, A.M. Can. Soc. C.E., Division Engineer, C.P.R., Winnipeg, born at St. John, N.B., Feb., 1876.

T. C. Hudson, Master Mechanic, C.N.Q.R. and Q. & L. St. J. Ry., Joliette, Que., born at Brockville, Ont., Feb. 20, 1873.

H. Hulatt, Commercial and Traffic Superintendent, G.T. Pacific Ry. Telegraphs, Winnipeg, born in London, Eng., Feb. 15, 1883.

C. Gardiner Johnson, Lloyds' Agent for British Columbia, Vancouver, B.C., born at Dunblane, Scotland, Feb. 8, 1857.

R. S. Logan, Vice President, G.T.R., Montreal, born at St. Louis, Mo., Feb. 13, 1864.

John McCraw, Superintendent, Southern Division, Central Vermont Ry., New London, Conn., born at Craigvale, Ont., Feb. 6, 1868.

G. L. McCrea, Local Freight Agent, C.P.R., Vancouver, B.C., born at Springtown, Ont., Feb. 9, 1876.

D. McDonald, District Passenger Agent, Canadian Government Railways, Montreal, born at Ste. Hyacinthe, Que., Feb. 28, 1862.

T. McNabb, ex-Master Mechanic, Alberta Ry. and Irrigation Co., now of Turin, Alta., born in Scotland, Feb. 16, 1849.

J. K. McNeillie, Superintendent, District 2, Eastern Division, C.P.R., Montreal, born at Toronto, Feb. 23, 1874.

D. C. Macdonald, Division Freight Agent, C.P.R., Regina, Sask., born at Elmsdale, N.S., Feb. 9, 1874.

D. MacPherson, M. Can. Soc. C.E., Assistant to Chairman, National Transcontinental Ry. Commission, Ottawa, born at Bath, Ont., Feb. 2, 1858.

C. S. Maharg, Superintendent, District 3, Manitoba Division, C.P.R., Brandon, born in Dufferin County, Ont., Feb. 4, 1867.

V. J. Melsted, Engineer of Water Service, Western Lines, C.P.R., Winnipeg, born at Gardar, N.D., Feb. 20, 1887.

G. A. Montgomery, General Superintendent, Algoma Central and Hudson Bay Ry., and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Bradford, Ont., Feb. 11, 1871.

A. Z. Mullins, Commercial Agent, G.T.R., Grand Rapids, Mich., born at Appin, Ont., Feb. 14, 1862.

M. G. Murphy, District Passenger Agent, C.P.R., Toronto, born at Halifax, N.S., Feb. 26, 1878.

G. J. O'Dowd, City Freight Agent, C.P.R., Quebec, born at Montreal, Feb. 4, 1874.

J. E. Proctor, District Passenger Agent, C.P.R., Regina, Sask., born at Sarnia, Ont., Feb. 17, 1878.

J. E. Robitaille, Comptroller, Roberval-Saguenay Ry., Chicoutimi, Que., born at Quebec, Feb. 17, 1870.

A. E. Rosevear, General Freight Agent, G.T. Pacific Ry. and G.T. Pacific Coast Steamship Co., Winnipeg, born at Montreal, Feb. 20, 1863.

H. H. Schaefer, Division Freight Agent, Intercolonial Ry., Moncton, N.B., born at Cologne, Germany, Feb. 10, 1848.

J. G. Scott, ex-General Manager, Quebec and Lake St. John Ry., Quebec, born there Feb. 13, 1847.

J. J. Scully, General Superintendent, Lake Superior Division, C.P.R., North Bay, Ont., born at Montreal, Feb. 3, 1872.

G. Spencer, Assistant Chief Operating Officer, Board of Railway Commissioners, Winnipeg, born in London, Eng., Feb. 21, 1865.

H. E. Suckling, Treasurer, C.P.R., Montreal, born at Gibraltar, Feb. 27, 1851.

Hugh Sutherland, Executive Agent, Canadian Northern Ry., Winnipeg, Man., born at New London, P.E.I., Feb. 22, 1845.

Sir Wm. C. VanHorne, K.C.M.G., Director, C.P.R., and President, Cuba Co., Montreal, born in Will County, Ill., Feb. 3, 1843.

F. L. Wanklyn, M. Can. Soc. C.E., General Executive Assistant, C.P.R., Montreal, born at Buenos Ayres, Feb. 25, 1860.

John L. Weller, M. Can. Soc. C.E., Superintending Engineer, Welland Ship Canal, St. Catharines, Ont., born at Cobourg, Ont., Feb. 13, 1862.

Canadian Government Railways Earnings Expenses.

The following figures, showing the receipts and expenditures of Canadian Government Railways for the fiscal year 1912-13, have been published unofficially. The figures for the Intercolonial Ry. are:—

Revenue.	
Passenger traffic	$3,215,821
Freight traffic	7,911,817
Mails and express	470,866
Miscellaneous	385,976
Total	$11,984,482
Working Expenses.	
Maintenance of way and structures	$2,058,458
Maintenance of equipment	3,041,672
Traffic expenses	230,481
Transportation expenses	6,378,894
General expenses	270,476
Total	$11,979,982
Net earnings	$4,500

The figures for the Prince Edward Island Ry. are:—

Revenue.	
Passengers	$180,347
Freight	171,348
Mails and express	26,446
Miscellaneous	11,331
Total	$389,472
Working Expenses.	
Maintenance of way and structure	$135,434
Maintenance of equipment	86,656
Traffic expenses	1,113
Transportation expenses	251,186
General expenses	15,581
Deficit	$100,498
Total	$489,970

National Transcontinental Railway Construction.

Construction operations on the N.T.R. have been suspended until the spring. Track has been laid over the entire line from Moncton to Winnipeg, but there is still a great deal of finishing up to be done before through traffic will be opened up. On some parts of the line the track is being carried across streams by temporary wooden bridges. These, however, are to be replaced by steel structures. It is expected that the ballasting and other work will be completed by the end of this year.

Construction work is being proceeded with on the car ferry slips at Levis. The car ferry, for use between these points, was launched from the Cammell, Laird & Co.'s yards, Birkenhead, Eng., Jan. 10. (Jan., pg., 24.)

Grand Trunk Pacific Railway Construction.

Press reports from Fort George, B.C., Jan. 14, stated that the steel laying gang working from the east had reached that point, 1,279 miles from Winnipeg. The present end of steel coming easterly from Prince Rupert, is at mileage 324, which leaves about 175 miles of steel to be laid before track-laying will be completed through between Winnipeg and Prince Rupert. It is expected that the two ends of track will be joined early in May. A train service is being operated to mileage 1233 west of Winnipeg, and it is expected to start a service to Fort George in the spring. Easterly from Prince Rupert, trains are running to mileage 325.

Grand Trunk Pacific Branch Lines.—The question of the entry of the company's branch line from Lake Superior Jct. to Fort William, Ont., into Port Arthur, is under discussion. The latest route suggested was through the grounds of the Port Arthur Agricultural Association, but this was vetoed by the Chief Engineer of the Board of Railway Commissioners.

The Saskatchewan Legislature has passed the following acts affecting the company's lines in the province:—Approving the agreement between the G. T. Pacific Saskatchewan Ry. and the town of Weyburn, respecting the construction of a branch of the Regina-International Boundary line into the town. Authorizing the guarantee by the province of the securities of the company in respect of the construction of various lines in the province, as approved by the Lieut.-Governor-in-Council. Confirming an agreement between the G.T.P.B.L. Co. and the City of Regina, respecting terminals; authorizing the granting of aid towards the construction of terminals in Saskatoon, Regina, and Moose Jaw, for the G.T.P.B.L. Co. and the G.T.P. Sask. Ry., and authorizing the guaranteeing of the securities of the G.T.P. Sask. Ry. in respect of the building of certain lines, as approved by the Lieut.-Governor-in-Council.

We are officially advised the following branch lines are under construction:—Harte to Brandon, Man., 25 miles; Talmage, on the Regina-Boundary branch, to Weyburn, Sask., 15 miles, and from Gerrond to Prince Albert, Sask., 22 miles. There are, we are advised, a large number of branch lines contemplated in Saskatchewan and Alberta, many of which have been fully surveyed. The construction programme for this year has not yet been arranged. (Jan., pg. 24.)

The Intercolonial Ry. Dining Car Department, of which L. B. Archibald is Superintendent, has taken over the charge of the diningroom service at Moncton, N.B.

Canadian Northern Railway Construction, Betterments, Etc.

Mount Royal Tunnel and Terminal Co.—Supplemental letters patent were granted to the Canadian Northern Montreal Tunnel and Terminal Co., Jan. 10, changing the name of the company to the Mount Royal Tunnel and Terminal Co.

The Quebec Court of Appeal, Jan. 11, decided that the owners of property under which the tunnel is being constructed may bring actions for damages to property other than those which are taken cognizance of by the arbitrators dealing with the question of price. The original action was brought by the owner of a property at the corner of Bellingham and Maplewood Avenues, the sum claimed being $9,000. The company claimed that the whole amount of the damage should be estimated by the arbitrators. This exception was dismissed in the lower court, and the judgment is now upheld on appeal.

The Board of Railway Commissioners has reserved judgment on the application of the company to expropriate the whole of the Rainville property, including a small strip not included in the original application. The company subsequently took only an easement for the tunnel, but the owner claimed damages to the property. The company said the property might be useful for station purposes in the future.

Canadian Northern Ontario Ry.—A through fast freight service was inaugurated between Toronto, Ottawa, Montreal and Quebec, Jan. 8, over the Toronto-Ottawa line, the last section of which was recently completed; thence over the old Great Northern Ry. and the old Chateauguay and Northern Ry. into Montreal, and over the old Great Northern Ry. to Quebec. A regular train service is operated from Toronto to Sydenham, Ont., and a limited service from Sydenham into Ottawa.

A bylaw will shortly be submitted to the ratepayers of St. Catharines, Ont., providing for a bonus of $100,000 to aid in building the company's Toronto-Niagara line through that city. The agreement provides for the completion of the line from Hamilton to St. Catharines within three years, and its completion from Toronto to Niagara in five years.

Montreal-Ottawa-Port Arthur Line.—Track laying has been completed easterly from Capreol to North Bay, Ont., and construction trains are being operated over it. Track has also been laid to between 50 and 60 miles east of North Bay. Out of Ottawa, track is laid nearly to Pembroke.

The last spike on the section of this line terminating in Port Arthur, Ont., was driven near Little White Otter River, 254 miles east of Port Arthur, Jan. 1, by Sir William Mackenzie, who, accompanied by an official party, left Toronto by a special train and travelled over the line via Parry Sound to Capreol, which is the point at which the Montreal-Ottawa-Port Arthur line connects with the line from Toronto; thence to Ruel, where present permanent operation ceases, and then over the newly completed line to the point where the track laying was completed on New Year's morning. The journey was then resumed and the special ran on to Port Arthur, which was reached at midnight. The party was entertained at dinner immediately afterwards, and speeches were delivered by the Mayor of Port Arthur, Sir William Mackenzie, President; Sir Donald Mann, Vice President; D. B. Hanna, Third Vice President, and others.

The building of this section of the line was entrusted to Foley, Welch and Stewart and the Northern Construction Co., in 1911, under the terms of a special agreement with the Dominion Government. Actual construction work started early in 1912. The line has a gradient of 0.4%, with an almost perfect alignment, the final location being made over a period of four years by H. K. Wicksteed, Chief Engineer of Surveys.

Work has been suspended on the line for the winter, but it is expected that ballasting gangs will be put on in the spring in order to get the line in running condition by the fall. One lift of ballast has already been put on. Station buildings have been completed to mileage 183 out of Port Arthur.

Canadian Northern Ry.—The Board of Railway Commissioners has authorized the opening for traffic of the revised line across Rainy Lake, Ont., mileage 224.3 to 226.4.

The Lieut.-Governor of Manitoba, in his speech at the opening of the Provincial Legislature, referring to the building of the railway to Hudson Bay by the Dominion Government said:—"It is the fixed policy of my Government to extend the Oak Point line northward to intersect the same in such time as will guarantee our ability to take advantage, when the main line of the railway is ready for operation, of this through route to the markets of the world for the products of the farms of Manitoba. My Government believe that the opening of such a through route will prove of great benefit to the agriculturists of this Province." This line is being built by the C.N.R. and is in operation from Winnipeg to Gypsumville, 162 miles.

The Board of Railway Commissioners has authorized the opening for traffic of the extension of the Oakland Branch from mileaged 24, for a further distance of 12 miles.

The C.N.R. is carrying on its construction work in Manitoba, Saskatchewan and Alberta, not only under its own charter, but also under the charters of the Canadian Northern Saskatchewan Ry., the Canadian Northern Western Ry., and the Canadian Northern Alberta Ry. The construction work done under the charters of these companies for 1913 is as follows:—

Grading was done on 23 lines and track laying on 19 lines. The main line out of Edmonton is being built under the Canadian Northern Alberta Ry. charter, and on this 34.28 miles of grading were done, and 143.36 miles of track laid to the provincial boundary. A 5 mile spur, known as Huffs spur, was also laid.

The work done on the various branch lines, arranged according to provinces, is as follows:—

	Grading. Miles.	Track laid. Miles.
C.N. Ry.	107.37	271.72
C.N. Sask. Ry.	4.00	—
C.N. Western Ry.	87.54	74.53
C.N. Alberta Ry.	34.28	148.31
Total	233.19	494.56
	Miles graded.	Miles track laid.
Manitoba—		
Winnipeg cut off	3.98	3.34
Winnipeg & Northern Ry.	7.45	—
Deerfield (Oak Point line)	12.50	12.50
Greenway extension	2.94	15.33
Oakland extension	—	11.69
Grosse Isle extension	14.28	22.80
	41.15	65.66
Saskatchewan—		
Bienfait to Estevan	8.20	—
Canora northerly	1.90	—
Goose Lake branch	—	25.78
Jackfish line	—	17.10
Macrorie east	2.26	8.59
Macrorie west	34.83	31.57
Moose Jaw line	0.30	1.85
Prince Albert-Battleford line	1.15	51.95
Swift Current line	7.10	55.85
Vonda, northerly	8.20	—
Wroxton, westerly	4.00	—
	67.94	192.69
Alberta—		
Vegreville-Calgary line	0.23	13.20
Calgary, southerly	1.60	—
Strathcona-Camrose	0.45	0.17
Brazeau line	26.77	42.60
Camrose south east	53.45	—
Peace River line	6.50	30.65
Strathcona-Calgary line	0.30	1.28
Red Deer spur	0.52	—
Main line	34.28	148.31
	124.10	236.21
Total for three provinces	213.19	494.56

The three measures with respect to the guaranteeing of the company's bond issues by the Province of Saskatchewan mentioned in our last issue, have received final assent. The question of the construction programme for the year, under these acts, is now under consideration by the government.

Canadian Northern Pacific Ry.—The C.N. Ry. construction department at Winnipeg is supervising the Canadian Northern Pacific Ry. construction from the Alberta-British Columbia boundary to the Albreda Summit.

During 1913 grading was completed for 67.8 miles westerly from the provincial boundary, and 6.07 miles of track laid.

The remainder of the line in British Columbia is being built under the Vancouver construction department, T. H. White being Chief Engineer. Track was laid from Sumas to Hope, 41.75 miles, in 1912, and during 1913 an additional 206 miles of track was laid. Of this 12 miles was on the branch from New Westminster to Steveston, leaving 194 miles of track laid on the main line. Track has been laid from Hope to Cisco, 62 miles, and nine miles between the steel bridges under construction between Cisco and Kamloops; for 123 miles from Kamloops to Cottonwood. The distance from Cisco to Kamloops is 103 miles, and from Cottonwood to Yellowhead Pass is 134 miles. The company has under survey a line from Kamloops to Kelowna and Shuswap Falls, 141 miles, and a line from Westminster bridge to Lulu Island bridge, five miles.

Considerable progress is being made with the construction of the terminals at Port Mann. It is expected that the locomotive house will be completed early in February.

Sir Donald Mann, Vice President, arrived in Vancouver, Jan. 5, when he is reported to have said that the company's line would enter Vancouver by a tunnel three miles long, the exact location of which had not been settled. (Jan., pg. 29.)

Dominion Railway Subsidy Agreements.

The Dominion Government has entered into agreements under the act granting aid in the construction of railways, for the following lines:—

Canadian Pacific Ry., Jan. 8, for railway bridge over the Saskatchewan River, at Outlook, Sask. This bridge has been built and opened for traffic It was fully described and illustrated in Canadian Railway and Marine World, June, 1913.

Kettle Valley Ry., Dec. 16, 1913, for a line from Merritt to Penticton wharf, B.C., 145 miles, and for a line from a point on the line between Merritt and Penticton wharf, about 25 miles south of Merritt, to a point on the Fraser River, near Hope station, B.C., 55 miles.

Kootenay Central Ry., Dec. 15, 1913, for a line from Golden, via Windermere and Fort Steele, B.C., to a point on the British Columbia Southern Ry., at or near Jukeson, 175 miles.

Locomotive Design.—The present tendency is to use larger cylinders, maintaining former steam pressures. The first step in this direction was to use larger cylinders with decreased steam pressure, but it has since been found advisable to maintain the pressure as before.

Canadian Pacific Railway Construction, Betterments, Etc.

Interprovincial and James Bay Ry.—The first 10 miles of this extension of the C. P. R. line, running from Mattawa, Ont., to Timiskaming, and Kipawa, Que., which branches off at Lumsden's Mills, and extends to Opemican, has been completed. The next point to which the line will be built, is said to be Ville Marie, but nothing has been decided as to when it will be put under contract.

Eastern Division.—The second track work has been completed to St. Johns, Que., the second section between Farnham and St. Johns, 12.7 miles, having been finished during 1913.

The company has under construction in Montreal, the Forsyth St. branch, 4.4 miles.

The Glen passenger car yard has been remodelled by building a ladder track across the body tracks, near the centre of the yard. This divides the yard into two independent sections, making possible the handling of trains in and out of the yard more expeditiously, and obviating the use of a Y, the trains being turned by going around the loop, which has been made possible by the use of the ladder. It is rumored that the car shops are to be rebuilt, to relieve the congestion at this point. A wheel lathe is to be installed shortly, so that wheels removed from cars in the shop drop pit may be turned there, instead of having to ship them to the Angus shops as at present.

Ontario Division.—All along the Campbellford, Lake Ontario and Western Ry., which extends from Glen Tay to Agincourt, Ont., 182.6 miles, gangs of men are engaged in putting the finishing touches to the work. The passenger and freight stations, and the other buildings are nearly all completed. It is expected that the line will be put in operation early in the spring. In preparation for the opening of the line, a second track has been laid from Agincourt to Leaside Jct., 12.7 miles. From Leaside Jct. into Toronto, a second track has been in operation for some time.

The Board of Railway Commissioners has authorized the opening for traffic of a third branch from the north side of the Queen St. subway at North Parkdale station, to Royce Ave., Toronto.

Although no official intimation has been received to that effect, it is said that a further distance of about 30 miles of second track will be laid on the Toronto-Windsor line this year. The present second track extends to Guelph Jct., and Galt is said to be the end of the next section to be put under contract.

We are officially advised that nothing has been decided with respect to the proposed cutoff between the London and the Muskoka subdivisions. One proposal is to build a line from Guelph to Bolton Jct., on the Toronto-Sudbury line. Surveys have been completed.

Lake Superior Division.—The second track work on this division west of Romford, the point where the line from Toronto joins the transcontinental line, to Port Arthur, which has been under construction for about three years, will be continued during this year. The work is being carried on in short stretches at different points on the line, and includes reduction of gradients and diversions.

Manitoba Division.—It is not expected that the Kildonan cutoff will be put in operation until the spring. The line is finished with the exception of some little work at the bridge across the Red River.

The work in progress at Winnipeg station is reported to have progressed faster than was anticipated. The outside work on the hotel part of the buildings has been completed, and all the piles have been driven for the alterations at the Main St. subway. The plans for the proposed changes in this subway were finally approved by the Board of Railway Commissioners Dec. 31.

The construction programme for this year provides for the building of an extension of the branch now terminating at Gimli, northerly for 26 miles. Some grading has already been done on it.

Saskatchewan Division.—The construction programme for this year includes the building of a line from Kerrobert, Sask., for 75 miles, to Monitor, or a few miles west of the Saskatchewan-Alberta boundary. This will give a line through to Lacombe, on the Calgary and Edmonton Ry.

The Board of Railway Commissioners has approved of location plans for the line from Swift Current, northwesterly from mileage 169 to 175.

Alberta Division.—The construction programme for this year includes the following, probably completing certain lines which have been under construction for two or three years. From Empress, on the Lacombe-Kerrobert line, to Bassano, 79 miles; from Coronation, on the above line, northwesterly, 45 miles; from Empress to Bassano, 140 miles; from Suffield West for 30 miles, and for 90 miles west from Shaunavon, on the Weyburn-Lethbridge line.

The Board of Railway Commissioners has authorized the opening for traffic of the Suffield-Blackie branch, mileage 26.5 to 57.2.

Alberta Central Ry.—Application is being made to the Dominion Parliament to ratify an agreement with the Canadian Northern Western Ry., respecting the Rocky Mountain House joint section.

The construction programme for this year provides for the building of about 35 miles of track, west from Red Deer, in continuance of the 30 miles laid up to Dec. 31, 1913.

Kootenay Central Ry. is in operation from Golden to Spillimacheen, B.C., 40 miles, and it is expected that a train service will be put on a further 20 miles during the summer. Steel has been laid from Colvalli, northerly for 39 miles, but this section has not yet been put in operation.

The construction programme for this year provides for the building of about 70 miles, which will complete the line, the construction of which has been in progress for three years.

Rogers Pass Tunnel.—The driving of the pioneer tunnel at Rogers Pass, B. C., from which crosscuts will be made to the main double track tunnel, so as to drive it from different headings, is reported to have been made about 600 ft., from the eastern end. A good deal of the approach work at the western end of the tunnel site has been done, and it is expected to start the pioneer tunnel at an early date. The machinery for boring the main tunnel is being delivered and got in place. The contract for the tunnel is in the hands of Foley, Welch and Stewart, and we are advised, in respect of the press dispatches from Denver, Colo., stating that a contract had been let to J. A. McIlwee & Son, of that city, for the tunnel, that there had been some negotiations with that firm for the boring of the pioneer tunnel, but that no contract had been placed.

Vancouver Terminals.—Work on the new terminals at Vancouver is reported to be making satisfactory progress. It is expected that the eastern wing of the new station building will be ready for occupation Mar 1. When the new station is completed the present one will be torn down, and on its site will be built the Granville St. viaduct. This will extend from the present end of Granville St. to the water front, and will connect with the passenger and freight sheds on pier D. The wharf accommodation is being rearranged on the most approved lines. (Jan., pg. 26.)

Railway Route Maps Approved.

The Dominion Minister of Railways has approved the following route maps:—

Canadian Pacific Ry., Jan. 9, from Guelph Jct. to Cedar Mills, Ont., about 35 miles.

From Caron to junction with its Bassano easterly line, Alta., 152.24 miles.

Kettle Valley Ry., Dec. 12, 1913, revised location from Hydraulic Summit to Penticton, B.C., 58.2 miles.

Pacific and Hudson Bay Ry., Jan. 9, from Bella Coola to Hutnarko River, B.C., 60 miles.

Great Northern Railway Lines in Canada.

Projected lines in Alberta.—Engineers connected with the G.N.R., or some of its associated companies, are reported to be engaged in locating a route for a line from Sweet Grass, Mont., through Taber, and the surrounding coal mining district of Alberta.

G.N.R. interests are reported to have purchased 25 acres of land in the vicinity of Calgary, Alta., and press reports state that it is for terminal purposes.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—Plans are being prepared for the reconstruction of the car ferry slip at New Westminster, B.C., from which the car ferries operate to Sidney, Vancouver Island. The new slip, it is stated, will be 400 ft. long, three tracks wide, with an overhead bridge to raise and lower the apron according to the state of the tide. A new car ferry will be put on as soon as the slip is built. (Jan., pg. 28.)

Increased Width of Right of Way Through Bush Lands.—A. E. Doucet, District Engineer, National Transcontinental Ry., Quebec, who is a member of the Canadian Society of Civil Engineers Committee on Conservation, wrote this recently:—"As a railway man, and familiar with the operation of railways through timber country, I am more than ever convinced that our generally accepted width of 100 ft. for right of way is very much too limited. I know that this point has already been brought up before the committee, but it seems to me that in future the right of way through bush lands should certainly not be less than 200 ft., and a law should be passed to this effect for all future construction work."

Railway Lands Patented.—Letters patent were issued in connection with Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, during Nov., 1913, as follows:—

	Acres.
Calgary and Edmonton Ry.	1,275.60
Canadian Northern Ry.	194.844
Canadian Northern Alberta Ry.	11.60
Canadian Pacific Ry.	145.025
Grand Trunk Pacific Branch Lines Co.	13.72
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	5,825.06
Total	7,465.249

The Elimination of Grade Crossings in New England is at a standstill as the result of the financial condition of the railways. The Boston and Maine Rd., which has hitherto co-operated cheerfully with the states and the towns affected in the work of grade crossing abolition, this year announces its opposition to all such improvements on the ground that it has not the money to spend, and in the present state of the financial market it is impossible to obtain the money.

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Canadian Society of Civil Engineers Committee Report on Track.

At the Society's recent annual meeting in Montreal, H. R. Safford, Chief Engineer, G.T.R., chairman of the committee on tracks, presented the following report:—

Dear Sir,—Owing to a tremendous pressure of business, we were not able to hold a meeting until Dec. 1, 1913. This meeting was attended by A. C. MacKenzie and myself. (F. P. Gutelius, the other member, was not present.)

The subject assigned to the committee is a very large and comprehensive one, and the work to be carried on should be in accordance with a well defined programme, and, in order to conform to the wishes of the council as to procedure, it seems to us that the council should give a general outline of the subjects which should be first attacked. This is the procedure generally followed in associations of this nature, and is the one which we think will obtain the best results from the committee.

The committee is so small that we do not think we can carry on effective research work in a satisfactory manner, because in the work associated with track matters it is quite desirable that results obtained by the committee should be after a very general study by the committee, which should be representative not only as to individual railways but locality. We are, therefore, impressed that there should be an increase in the membership of this committee to at least 8 or 10, and a committee of this size can accomplish much more effective work.

We, therefore, recommend for consideration by the council the following action:—That the council shall instruct as to the general subjects it would desire given first attention, and we might suggest that two be selected from the following list: Recommended specifications for tie plates, for angle bars, for various classes of tie treatment, for bolts, spikes, etc. Recommended practice as to size of ties, as to character of timber, as to proper tie spacing. Economics of track labor, embracing the following: Proper methods of conducting track work, of measuring efficiency, of equating track values, of educating section foremen, and numerous other subjects could be suggested. That the committee membership be increased to 10.

We believe in the creation of this committee the membership should not be entirely confined to railway engineers, as there will be some features involved where it would be desirable to have the benefit of the views of men connected with steel manufacture, treatment of ties and other subjects which are associated with materials going into track use.

Interchange of Passenger Traffic at Toronto.—R. L. Fairbairn, General Passenger Agent, Canadian Northern Ry. lines east of Port Arthur, has issued the following notice:—"Arrangements have been completed for the interchanging of passenger traffic at Toronto between Canadian Northern Eastern Lines and the G.T.R. and C.P.R., applicable for all classes of traffic to and from all points. One coupon only will be required from Toronto to any destination on any of our allied lines—coupon to read 'Canadian Northern Ontario Railway.' Division requirements will be given later."

Chuting of Concrete.—Observations show that with wooden chutes of planed boards, 2 ft. wide, and from 8 to 10 ins. deep, the preferable slope is 4 ins. per ft. Slopes of 2 ins. per ft. require a man to keep the chutes clear, and of 6 ins. per ft., cause the ingredients to separate, and require the use of baffles to retard the motion.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414,500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	298,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
	$13,364,900	$9,324,200	$4,040,700	$587,700
Incr.	$ 1,125,000	$ 537,300	$ 587,700	.....

Average mileage under operation during 1913, 4,480, against 4,297 in the previous year. Mileage operated during Dec., 1913, 4,458.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$11,993,062.27	$7,876,269.09	$4,116,793.18	x$331,383.72
Aug.	11,434,459.88	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
	$63,471,836.36	$40,487,221.40	$22,984,614.96	$249,182.32
Incr.	$ 2,164,923.71	$ 1,915,741.30	$ 249,182.32	.....

x Decrease.

Approximate gross earnings for Dec., $11,695,000, against $12,108,000 for Dec., 1912. During Dec., 1913, the mileage under operation was increased to 11,827.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings and expenses of the G.T.R., C.A.R., G.T. Western Ry. and D.G.H. & M.R. for Nov., 1913, as compared with those for Nov., 1912:—

Grand Trunk Railway.

	1913.	1912.
Earnings	$3,523,400	$3,534,500
Expenses	2,813,000	2,820,800
Net earnings	$710,400	$713,700

Canada Atlantic Railway.

	1913.	1912.
Earnings	$200,900	$223,500
Expenses	215,300	211,400
Net earnings	$14,400*	$12,100

Grand Trunk Western Railway.

	1913.	1912.
Earnings	$577,200	$621,000
Expenses	502,500	523,800
Net earnings	$74,700	$97,200

Detroit, Grand Haven and Milwaukee Ry.

	1913.	1912.
Earnings	$241,900	$243,400
Expenses	210,200	197,600
Net earnings	$31,700	$45,800

*Deficit.

TRAFFIC RECEIPTS OF THE SYSTEM.

Aggregate from July 1 to Dec. 31:

	1913	1912	Increase	Decrease
G.T.R.	$23,137,502	$22,408,122	$729,380	.....
C.A.R.	1,276,634	1,971,732	.....	$35,098
G.T.W.R.	2,718,177	2,745,761	.....	27,584
D.G.H. & M.R.	1,347,427	1,329,057	18,370	.....
Totals	$29,439,740	$28,754,672	$685,068	.....

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for Nov., were $1,004,915; for Dec., $555,526. Aggregate from July 1 to Dec. 31, 1913, $4,293,115.

Steel Rail Orders.—A press dispatch from Sydney, Jan. 6, said that the Dominion Iron and Steel Co. was finishing a large order for rails for the Canadian Northern Ry., after which the rail mill would be shut down 10 days for repairs; that an order had been received from the Australian Government for 5,000 tons of rails, which was expected to be followed by further orders from the same source; that after the Australian order is finished a big order for the C.P.R. will be rolled, and later a 12,000 ton order of 60 lb. rails for the west.

Mainly About Transportation People.

R. B. ANGUS, director, C.P.R., left Montreal, early in January, for a trip round the world.

LADY MANN left Toronto, Jan. 13, for England, en route to the south of France, to spend the winter with her son.

J. W. NORCROSS, Managing Director, Canada Steamship Lines, Ltd., Montreal, sailed from New York, Jan. 1, for Great Britain.

L. C. GILMAN, Assistant to the President, Great Northern Ry., has been made President of the Spokane, Portland & Seattle Ry. and affiliated lines, succeeding J. H. Young.

JOHN SEBASTIAN, 3rd Vice President in charge of passenger traffic of the Chicago, Rock Island and Pacific Ry., with office at Chicago, retired Jan. 1 on account of ill health.

W. D. SCOTT, heretofore General Superintendent, Great Northern Ry., at Seattle, Wash., has been appointed General Superintendent Spokane, Portland and Seattle Ry.

C. S. MUSSON, Travelling Freight Agent, New York, Chicago and St. Louis Rd., Chicago, Ill., who died there recently, was born in Toronto, Dec. 23, 1844, and had been in that company's service since 1888.

F. A. DELANO, M. Am. Soc. C.E., former President and one of the receivers of the Wabash Rd., has been elected President, Chicago, Indianapolis & Louisville Ry., succeeding Fairfax Harrison, resigned.

GEORGE BURY, Vice President, C.P.R., Winnipeg, contributed an article on the primary producer and his future to the Toronto Globe's recent annual financial supplement.

DAVID SEATH, formerly Secretary, Montreal Harbor Commissioners, who has been ill with pneumonia for some time, was reported recently to be out of danger, and convalescing slowly.

W. S. PAINTER, formerly Architect C.P.R., who, with Mrs. Painter, has been staying some time in Montreal, has been visiting friends in Philadelphia, Pa., before returning to Vancouver, B.C.

HUNTER BLAIR, of the Canadian Northern Ry. service, who died in Toronto in December, was not, we are informed, a brother in law of R. M. Horne Payne, the C.N.R. director in England, as stated in our January issue.

LEWIS STOCKETT, General Superintendent, Coal Mining Branch, Natural Resources Department, C.P.R., Calgary, Alta., was re-elected President, Western Coal Operators Association, at the annual meeting in Fernie, B.C., Jan. 9.

C. A. MACDONALD, Comptroller, Northern Navigation Co., was presented with an address and a number of silver articles by the citizens of Collingwood, Ont., Jan. 16, on his removal to Sarnia, where the Northern Navigation Co.'s chief office is now located.

A. J. MITCHELL, Comptroller, Mackenzie, Mann and Co., Ltd., and Assistant to Vice President, Canadian Northern Ry., Toronto, and M. H. MacLEOD, General Manager and Chief Engineer, Canadian Northern Ry., Winnipeg, left Toronto Jan. 2 for a three weeks holiday in Florida.

EDMUND M. SHERWOOD, who has been appointed Manager, Salisbury and Albert Ry., Hillsboro, N.B., was born at Salisbury, N.B., Oct. 1, 1887, and entered railway service Nov., 1902, since when he has been, to Nov. 1, 1913, station master at Hillsboro, N.B., and latterly also assisted the Manager.

J. P. QUILTY, who has been appointed Superintendent of Station Service, Boston and Maine Rd., Boston, Mass., was born in New Brunswick, where he commenced his railway service with the Intercolonial Ry. He has been in Boston and Maine Rd. service for 27 years.

M. LILLIS, formerly Roadmaster on various sections of the C.P.R., between Brandon, Man., and Swift Current, Sask., who died at Broadview, Sask., Jan. 5, had been in C.P.R. service since its inception. The funeral was attended by a number of the chief officials of the company in the west.

CAPT. J. J. RILEY, for a number of years Superintendent of Pilots, Montreal, died there Jan. 8. The funeral, which was conducted at the Mount Royal Crematorium, Jan. 10, was attended by the Dominion Wreck Commissioner, under whom Capt. Riley had acted frequently as nautical assessor, and a number of Marine Department, and Harbor Commission officials.

P378 John L. Hodgson,
Master Car Builder, Grand Trunk Pacific Railway.

A. J. NIXON, Chief Operating Officer, Board of Railway Commissioners for Canada, died suddenly at Ottawa, Jan. 12. He was born at Waterloo, Que., in 1875, and entered G.T.R. service in 1889, serving in various capacities, as operator, dispatcher and Chief Dispatcher, until 1907, when he was appointed Assistant Superintendent at London, Ont. He was appointed Chief Operating Officer, Board of Railway Commissioners, in 1909

W. C. CASEY, whose appointment as General Agent, Passenger Department, Atlantic Steamship Lines, Winnipeg, was announced in our last issue, was born at Moncton, N.B., Dec. 12, 1882, and entered transportation service, Aug., 1901, since when he has been, to Apr., 1902, ticket clerk, Intercolonial Ry., Moncton, N.B.; Apr., 1902, to Apr., 1903, ticket clerk, C.P.R., Halifax, N.S.; Apr., 1903, to Apr., 1910, Travelling Passenger Agent, C.P.R., St. John, N. B.; Apr., 1910, to Dec., 1913, chief clerk to General Passenger Agent, Atlantic Steamship Lines, C.P.R., Montreal.

E. F. L. STURDEE, whose appointment as Assistant District Passenger Agent, C. P.R., Toronto, was announced in our last issue, was born at St. John, N.B., Mar. 29, 1876, and entered C.P.R. service Dec. 1893, since when he has been, to July, 1894, office boy, Moncton, N.B.; July, 1894, to Aug., 1897, clerk and stenographer, Assistant General Passenger Agent's office, St. John, N.B.; Aug., 1897, to June, 1902, stenographer, rate and excursion clerk, Ontario Division, Assistant General Passenger Agent's office, Toronto; June, 1902, to Dec., 1910, excursion clerk, General Passenger Department, Eastern Lines, Montreal; Dec., 1910, to Dec. 1, 1913, chief clerk to General Passenger Agent, Eastern Lines, Montreal.

C. H. BOOTH, who has resigned the position of Local Freight Agent, Midland Ry. of Manitoba, Winnipeg, was born at Banff, Scotland, Feb. 16, 1882, and entered railway service July, 1900, since when he has been, to June, 1902, general clerk, C.P.R., Winnipeg; June, 1902, to Aug., 1904, billing clerk, Canadian Northern Ry., Winnipeg; Aug., 1904, to Apr., 1906, chief billing clerk, same road; Apr., 1906, to June, 1907, inward rate clerk, same road; June, 1907, to May, 1908, chief rate clerk, same road; May, 1908, to Oct., 1909, accountant, same road; Oct., 1909, to May 15, 1912, Assistant Local Freight Agent, same road, Winnipeg, on which latter date he was appointed to the position he has just resigned to enter private business.

JULES E. MORAZAIN, whose appointment as Assistant Superintendent, Montreal Terminals, C.P.R., was announced in our last issue, was born at Wheatland, Que., July 31, 1875, and entered C.P.R. service May 3, 1890, since when he has been, to May 24, 1890, clerk, Drummondville, Que.; Aug. 1, 1890, to Jan. 8, 1891, operator, Foster, Que.; Jan. 9 to Aug. 12, 1891, operator, Richfort, Vt.; Aug. 12, 1891, to Aug. 15, 1892, undertook a commercial course; Aug. 15 to Sept. 26, 1892, operator, C.P.R., Sutton, Que.; Sept. 26, 1892, to Feb. 8, 1894, operator, Highlands, Que.; Feb. 9 to July, 1894, operator, Richfort, Vt.; July to Oct., 1894, relieving operator at various points; Oct., 1894, to May 27, 1895, operator, Highlands, Que.; May 27, 1895, to Sept. 24, 1901, agent, Highlands, Que.; Sept. 24, 1901, to Nov. 3, 1908, agent, Mile End, Que.; Nov. 3, 1908, to Jan. 31, 1913, General Agent, Operating Department, Quebec, Que.; Feb. 1 to Dec. 6, 1913, Assistant Superintendent, District 3, Eastern Division, Quebec, Que.

HON. GEORGE A. COX, who died at Toronto, Jan. 16, was born at Colborne, Ont., May 7, 1840, and commenced business life as an operator in Montreal Telegraph Co.'s service, there. He was placed in charge of the company's office at Peterboro, Ont., in May, 1858, and remained in that town for 30 years. During this period he became interested in insurance business under the Canada Life Assurance Co., later becoming President, and founding several other insurance companies. He was one of the original organizers and directors of the Grand Trunk Pacific Ry., and a director of the Toronto Ry., and its subsidiary companies, was President for 17 years of the Canadian Bank of Commerce, a director of the Canadian General Electric Co., and of many other financial and industrial organizations. One of the most interesting episodes in his life was his connection with the management and reorganization of the Midland Ry. The main line was projected to run from Port Hope to Midland, taking in Peterboro. The enterprise was premature, and it was soon in financial difficulties too formidable to be overcome. In the absence of capital to complete the road the latter passed under the control of the British bondholders. The only way of escape

from financial ruin was to write off part of the debt, increase the capital sufficiently to enable the proprietors to complete the system, and transfer the management to Canada. Fortunately the creditors agreed to this solution, and he was chosen President in 1878. The line was continued to Midland, and a link was built to connect Peterboro and Lindsay. After the reorganization was a success the system was taken over by the G.T.R. and consolidated with other local lines into its present Midland Division.

BARON STRATHCONA AND MOUNT ROYAL (Donald A. Smith), High Commissioner for Canada, London, Eng., who died there, Jan. 20, was born at Archieston, Morayshire, Scotland, Aug., 1820, and was educated locally with the intention of following the legal profession. He, however, entered the Hudson's Bay Co.'s service in 1838, and spent 13 years on the Labrador coast, being afterwards transferred to the Northwest Territories, where he occupied various positions, towards the latter part of his service becoming, chief factor, Resident Governor, and Chief Commissioner for the company in Canada. He became involved in the Red River Rebellion in 1869, and received the thanks of the Governor General in Council for the ability he evidenced in that connection. On the organization of the Province of Manitoba, he was elected to the Legislature for Winnipeg and St. John, was later appointed on the Legislative Council for the Northwest Territories, and subsequently was also elected to the Dominion House of Commons for Selkirk. In 1874 he resigned his seat in the Legislature, retaining his seat in the Dominion Parliament until 1880, when he was defeated. He re-entered politics in 1887, representing Montreal West, until Apr., 1896, when he retired from political life in Canada on his appointment as High Commissioner for Canada in London, Eng., which position he held to the time of his death. He was associated with the Canadian Pacific Ry. from its commencement, but for political reasons his name was not included with those to whom the original charter was granted, and was a director and member of the executive committee since the early days of the company's history. In the early days of the railway, he, in conjunction with Lord Mount Stephen, risked practically the whole of his fortune on the construction of the road, and his work in this connection was eulogized, Jan., 1897, by Sir Charles Tupper, a former Prime Minister of Canada, in the words, "the C.P.R. would have no existence to-day, notwithstanding all the Government did to support that undertaking, had it not been for the indomitable pluck, energy and determination, both financially and in every other respect, of Sir Donald Smith." He drove the last spike in the C.P.R., Nov. 7, 1885. He was created a K.C.M.G. in 1886, a G.C.M.G. in 1896, was raised to the peerage as Baron Strathcona and Mount Royal of Glencoe (Scotland) and Montreal (Canada) in 1897, and created a G.C.V.O. in 1908. As an additional honor the peerage was granted with a special remainder to his daughter and her heirs. He has also been honored with university degrees and honorary positions, too numerous to mention, as are also his positions in connection with financial, industrial and educational institutions, and his benefactions of all kinds. Apart from his official connections with Canada, he constantly kept in close touch with the Dominion, and was a frequent visitor, having been in Ottawa and Montreal quite recently.

A Correction.

By an unfortunate mistake the first lines of each of the two paragraphs giving biographical data of J. G. Sutherland, Car Service Agent, Alberta Division, C.P.R., Calgary, and of the late James Charlton, in our last issue, were transposed. The items should have read as under:—

JAMES CHARLTON, Chairman, Transcontinental Passenger Association, who died at Chicago, Ill., recently, after a short illness, was born at Bothal, Northumberland, Eng., May 15, 1832, and commenced railway service there, Apr., 1847, since when he has been, to Mar., 1857, junior clerk, chief clerk, and cashier, Newcastle and Carlisle Ry., Newcastle upon Tyne, Eng.; Apr. 29, 1857, to 1870, assistant to chief clerk, Audit Department, in charge of statistics and freight accounts, and chief clerk, auditor and General Passenger Agent, Great Western Ry. of Canada, now part of the G.T.R. Since March, 1870, his service has been in the U.S., retiring from active railway work, Jan. 1, 1900, when he held the position of General Passenger and Ticket Agent, Chicago and Alton Rd.

J. G. SUTHERLAND, whose appointment as Car Service Agent, Alberta Division, C. P.R., Calgary, was announced in our last issue, was born at Aulac, N.B., Nov. 24, 1882, and entered railway service June, 1898, since when he has been, to Apr., 1901, operator and assistant agent, Intercolonial Ry. at various points; Apr., 1901, to June, 1902, operator, Pacific Division, and relieving agent, C.P.R., at various points; June, 1902, to May, 1906, dispatcher, C.P.R., Revelstoke, B.C.; May, 1906, to Feb., 1907, dispatcher, C.P.R., Calgary, Alta.; Feb., 1907, to Apr., 1911, dispatcher and acting Chief Dispatcher, C.P.R., Cranbrook, B.C., and McLeon, Alta.; Apr. to Nov., 1911, dispatcher and acting Chief Dispatcher, C.P.R., Calgary, Alta.; Nov., 1911, to Nov., 1913, Chief Dispatcher, C.P.R., Medicine Hat, Alta.

The C.P.R. medical system on the Pacific Division is, according to a Vancouver, B.C., report, being reorganized. F. W. Peters, General Superintendent, was in Nelson, B. C., Jan. 14, discussing the proposed standardization of the medical service with representatives of the men. The proposed system provides for a uniform fee and a uniform service among all the employes on the division, instead of the present monthly fee of from 75 cents to $1.50, for which different services are given.

W. Holmes, stated to be chief clerk in the Mechanical Department, G. T. Pacific Ry., at Edmonton, Alta., was arrested, Jan 16, on a charge of theft of passes, and D. H. Pierce, of the Hub Employment Agency, Edmonton, Alta., was also arrested on the same day for illegally selling G.T.P.R. passes.

The Grand Trunk Railway's New Station at Stratford, Ont.

The new station which the G.T.R. has built at Stratford, Ont., was formally opened to the public, Dec. 17. It replaces the one which was built in 1867, and which for years has been inadequate for the needs of the traffic. A new station at Stratford was among the things promised on the occasion of the first visit of Sir Charles Rivers-Wilson and the late C. M. Hays, as President and General Manager respectively, to the city. This long promised station is now an accomplished fact.

The new building, of which an illustration is given on this page, has a frontage on Shakespeare St. of 151½ ft., and is 60 ft. wide at its widest part—the centre. At this point is the main entrance, which is sheltered by a canopy 18 ft. 10 ins. by 16 ft. 8½ ins. Inside the main door is a loggio, 15¼ ft. by 16 ft. 9½ ins., which leads to the general waiting room, 30 ft. 1¼ in. from front to rear, by 80 ft. In the centre, opposite the main entrance, is the ticket office, 15½ ft. by 16 ft., which extends 7½ ft. out on to the platform. To the right of the loggio are the men's smoking room and lavatories, and on the left the women's waiting room and lavatories. The lunch room, with kitchen and store, 40 ft. by 32 ft., is to the right, with its main entrance from the waiting room, while to the left is the parcel and baggage office and baggage room, 38 by 32 ft. The second story is devoted entirely to offices. The western end is given over to the private and general offices of the Superintendent; next comes the Trainmaster's office, and on the south side are the despatchers' offices. Following along are the offices of the Divisional Freight Agent, the General Yardmaster, the Supervisor of Bridges and Buildings, and the Resident Engineer. East of the station building, and connected with it by an umbrella roof of 75 ft., is the express building, 32 ft. by 57 ft. The central tower is 60 ft. high, and the two additional stories in it are fitted as file rooms.

Grand Trunk Railway Station at Stratford, Ont.

The building is constructed of Saginaw vitrified brick on a concrete foundation, with a slate roof. The internal fittings of the public parts of the station are tile floors, oak panelled ceilings, with walls finished in burlap. A new brick platform has been laid.

Cast Iron Wheel Records.—H. H. Vaughan, Assistant to Vice President, C.P.R., read a paper on this subject before the Canadian Railway Club, Jan. 13.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Supplement 2 to Canadian Freight Classification 16.

20967. Dec. 10. Re application of Canadian Freight Association, on behalf of railway companies, under sec. 321 of the Railway Act, for an order approving of proposed Supplement 2 to Canadian Freight Classification 16, containing certain increased, reduced and additional ratings on file with the Board. Notice of the proposed increased ratings having been given in The Canada Gazette, and the Board having invited consideration thereof by the Canadian Manufacturers' Association, the Montreal Chamber of Commerce, the Ontario Grocers' Guild, and the Boards of Trade of St. John, Quebec, Montreal, Ottawa, Toronto, Hamilton, Brantford, London, Winnipeg, Brandon, Regina, Saskatoon, Calgary, Edmonton, Vancouver and Victoria. Upon the consideration of what has been filed, and upon the recommendation of the Chief Traffic Officer of the Board—it is ordered that the said proposed supplement, as finally revised and submitted for approval by the Chairman of the Canadian Freight Association, by letter dated at Montreal, Dec. 6, 1913, be approved, to become effective not later than Jan. 20, 1914.

Milling in Transit at Sudbury.

Ontario and Manitoba Flour Mills for order directing C.P.R. to extend to the applicant's mill at Sudbury, Ont., the same milling in transit rates as are enjoyed by millers west of Fort William, Ont. It is ordered that the C.P.R. extend to the applicant the privilege of milling all rail grain at Sudbury in transit from Port Arthur, Fort William, and points west thereof, at the through rate to all points east of Sudbury and the Detroit and St. Clair Rivers reached by millers west of Fort William under milling in transit arrangements, subject to the regulations and restrictions thereof; and subject, also, to the same additional toll of 1c. for 100 lbs. for the terminal service at Sudbury, the said arrangement to come into force not later than Jan. 12, 1914.

Pulpwood Tariff, Temiscouata Railway.

21105. Dec. 23. Re Temiscouata Railway tariff, C.R.C. no. E. 217, effective Jan. 1, 1914, increasing rates on pulpwood, in carloads, from points on its line to Riviere du Loup for local delivery. Upon the application of Eastern Townships Lumber Co., complaining against the said increases. It is ordered that, for the present and pending the investigation by the Board, the said tariff be suspended.

Commutation Tickets for Chateauguay.

Jan. 7.—Re application of the Town of Chateauguay, Que., for an order directing the New York Central and Hudson River between Chateauguay and Montreal, good for one year. It is ordered that the application be refused. No one represented the town at the hearing.

G.T. Pacific Ry. Freight Mileage Tariff.

21131. Re application of Grand Trunk Pacific Ry. under sec. 327 of the Railway Act, for approval of its Standard Freight Mileage Tariff, C.R.C. 20, to apply between stations on its main line and branches in Alberta and British Columbia, between, and including, Thornton, Alta., and Prince George, B.C., including and cancelling the company's tariff, C.R.C. 18, applying between and including Thornton and mileage 1189, B.C., provisionally approved by order 18837, Aug. 5, 1913. It is ordered that the tariff, C.R.C. 20, be temporarily approved, pending judgment in the inquiry by the Board into the rates charged generally by the railway companies west of Crow's Nest, Canmore and Thornton.

Minimum Car Load Rates.

General order 110. Dec. 24. Re tariffs filed by railway companies subject to the Board's jurisdiction, increasing the minimum carload weights on buckwheat, oats, bran (in bulk), dried beet pulp, oat hulls (in bulk), pea hulls (in bulk), shorts, beets (except sugar), onions, turnips, and potatoes. It is ordered that, for the present and pending investigation by the Board, the said increased minimum carload weights be suspended. The schedules which are suspended are the following C.R.C. numbers:—Grand Trunk—E. 2857, E. 2859, supplement 14 to E. 2566, supplement 4 to E. 2708. Canadian Pacific—E. 2715. Michigan Central—Supplements 3 and 4 to 2022, supplement 1 to 1998, supplement 3 to 1721, 2159. Canadian Northern—Supplement 5 to E. 144, supplement 7 to E. 145, supplement 6 to E. 176, supplement 1 to E. 210, supplement 4 to E. 232. Ottawa & New York—986, supplement 1 to 215, supplement 1 to 417, supplement 3 to 755. Wabash, 758. Pere Marquette, 1696. Niagara, St. Catharines & Toronto, supplement 3 to 601. Toronto, Hamilton & Buffalo, 943. Quebec, Montreal & Southern, 493. Hamilton, Grimsby & Beamsville, 138. Napierville Junction, 121. Thousand Islands, supplement 5 to 218. Schomberg & Aurora, supplement 6 to 80. Hull Electric, F. 17. Essex Terminal, 214. Windsor, Essex & Lake Shore Rapid, 131. Chatham, Wallaceberg & Lake Erie, 312.

Charge for Refrigerator Car Detention.

General Order 115. Dec. 19. Re tariffs filed by railway companies imposing a charge for the detention of refrigerator cars over and above the car service charges prescribed by order no. 906, Jan. 25, 1906. It is ordered that, for the present and pending investigation by the Board, the following tariffs, viz.:—G.T.R. Co.'s C.R.C. no. E. 2858; C.P.R. Co.'s C.R.C. no. E. 2716; Canadian Northern Ry.'s C.R.C. no. E. 358; Michigan Central Rd.'s C.R.C. no. 2162; Toronto, Hamilton and Buffalo Ry.'s C.R.C. no. 945; and Ottawa and New York Ry.'s C.R.C. no. 989, be suspended.

21127. Dec. 29. Re tariffs filed by Canadian Pacific and Esquimalt and Nanaimo Railway Companies, imposing a charge for the detention of refrigerator cars over and above the car service charges prescribed by order 906, Jan. 25, 1906. It is ordered that, for the present and pending investigation by the Board, the following tariffs, namely:—C.P.R. Co.'s C.R.C. no. W. 1893, and Esquimalt and Nanaimo Ry. Co.'s C. R.C. no. 256, be suspended.

21128. Dec. 27. The tariff, C.R.C. 395, filed by Dominion Atlantic Ry., imposing a charge for the detention of refrigerator cars over and above the car service charges prescribed by order 906, Jan. 25, 1906: it is ordered that, for the present and pending investigation by the Board, the said tariff be suspended.

Minimum Carload Rates.

General order 116. Dec. 24. Re the tariffs filed by Railway Companies increasing the minimum carload weights on buckwheat, oats, bran (in bulk), dried beet pulp, oat hulls (in bulk), pea hulls (in bulk), shorts, beets (except sugar), onions, turnips, and potatoes. It is ordered that, for the present and pending investigation by the Board, the said increased minimum carload weights published in the C.R.C. schedules hereinafter mentioned be suspended, viz:—Grand Trunk, E. 2857, E. 2859, supplement 14 to E. 2566, supplement 4 to E. 2708; Canadian Pacific, E. 2715; Michigan Central, supplements 3 and 4 to 2022, supplement 1 to 1998, supplement 3 to 1721, 2159; Canadian Northern, supplement 5 to E. 144, supplement 7 to E. 145, supplement 6 to E. 176, supplement 1 to E. 210; supplement 4 to E. 232; Ottawa and New York, 986, supplement 1 to 215, supplement 1 to 417, supplement 3 to 755; Wabash, 758; Pere Marquette, 1696; Niagara, St. Catharines and Toronto, supplement 3 to 601; Toronto, Hamilton and Buffalo, 943; Quebec, Montreal and Southern, 493; Hamilton, Grimsby and Beamsville, 138; Napierville Junction, 121; Thousand Islands, supplement 5 to 218; Schomberg and Aurora, supplement 6 to 80; Hull Electric, F. 17; Essex Terminal, 214; Windsor, Essex and Lake Shore Rapid, 131; Chatham, Wallaceburg and Lake Erie, 312.

Railway Finance, Meetings, Etc.

Canadian Northern Ry.—A lease of rolling stock from the Imperial Rolling Stock Co. to the C.N.R., dated Dec. 1, 1913, and numbered series H.I., 1913, has been deposited with the Secretary of State at Ottawa.

A copy of a second supplementary mortgage dated Nov. 27, 1913, made by the C.N.R. to the British Empire Trust Co., and the National Trust Co. as trustees, has been filed with the Secretary of State at Ottawa. This mortgage is supplemental to one dated June 10, 1909.

Cape Breton Ry.—Sir William Mackenzie, President, Canadian Northern Ry., has denied the press reports sent out from Sydney, N.S., Jan. 7, to the effect that C.N.R. interests had acquired the Cape Breton Ry., which extends from Point Tupper to St. Peters, N.S.

Grand Trunk Pacific Ry.—It was reported in London, Eng., recently, that 65% of the recent issue of £2,500,000 5% notes had been taken up by the public, and were being dealt with on the market at a small premium.

Grand Trunk Ry.—A copy of an original counterpart no. 6 of an agreement of conditional sale between Blair & Co., the G.T.R. and the Equitable Trust Co., of New York, as trustees, series C., Nov. 1, 1913, has been deposited with the Secretary of State at Ottawa.

Ha Ha Bay Ry.—See Roberval and Saguenay Ry.

Roberval and Saguenay Ry.—From Jan. 1, the Ha Ha Bay Ry. ceased to exist, its charter and property having been acquired by the Roberval and Saguenay Ry., and its line merged into the larger project. J. E. A. Dubuc, is President. (Jan., pg. 22.)

Quebec and Saguenay Ry.—Press reports state that this uncompleted line will shortly be transferred to the Canadian Northern Ry. Sir Rodolphe Forget, the President, recently stated that an official memorandum would shortly be issued in regard to the negotiations for the sale of the line, but did not say anything as to what company was making the purchase, or as to the terms. Sir Wm. Mackenzie, President, C.N.R., was equally reticent.

Temiscouata Ry.—Net earnings for November, $3,277. Aggregate for five months ended Nov. 30, $18,372.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Dec. 7, $1,089,104, against $1,115,033 for same period 1912.

The Canadian Northern Ry. is considering the adoption of telephone train dispatching on its Toronto-Sudbury-Port Arthur line.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Board of Railway Commissioners.—Unconfirmed press reports state that the position of Chief Operating Officer, rendered vacant by the death of A. J. Nixon, has been offered to W. H. FARRELL, Terminal Superintendent, G.T.R., Toronto.

Canada Steamship Lines, Ltd.—See details of organization in Marine Department in this issue.

Canadian Northern Ry.—F. A. SHAW, heretofore District Freight Agent, Montreal, has been appointed Division Freight Agent, Lines East of Port Arthur and West of Ottawa, vice F. A. Young, resigned to engage in private business. Office, 68 King St. East, Toronto.

Canadian Pacific Ry.—A. WILLIAMS, heretofore Assistant Superintendent, District 1, Lake Superior Division, Sudbury, Ont., has been appointed Superintendent, District 2, Atlantic Division, vice V. A. Harshaw, transferred. Office, Woodstock, N.B.

V. A. HARSHAW, heretofore Superintendent, District 2, Atlantic Division, Woodstock, N.B., has been appointed Superintendent, District 1, Atlantic Division, vice W. A. Cowan, assigned to other duties. Office, Brownville Jct., Me.

C. SENAY, heretofore agent at Mile End and St. Henry, Que., has been appointed General Agent, Quebec, Que., the position formerly held by J. E. Morazain, before being appointed Assistant Superintendent, there. We are officially advised that no appointment will be made for the present to the position of Assistant Superintendent at Quebec, which was held by J. E. Morazain prior to his appointment as Assistant Superintendent, Montreal Terminals, as announced in our last issue.

T. M. BARRETT, heretofore Assistant Purchasing Agent, Calgary, Alta., has been appointed Chief Commissary Agent, vice A. S. Maynard, resigned to enter private business. Office, Montreal.

A. O. SECORD, heretofore Travelling Freight Agent, Toronto, has been appointed District Freight Agent, Ottawa, Ont., vice H. A. Plow transferred.

L. G. ROGERS, heretofore Chief Dispatcher, Farnham, Que., has been appointed Assistant Superintendent, District 1, Ontario Division, vice W. Tansley, transferred. Office, Havelock.

W. COULTER, until recently Superintendent, District 3, Ontario Division, Toronto, has been appointed Assistant Superintendent, District 1, Ontario Division. Office, Trenton.

L. MULKERN, heretofore District Freight Agent, London, Ont., has been appointed District Freight Agent, Toronto, vice J. H. Griffin, resigned.

W. TANSLEY, heretofore Assistant Superintendent, District 1, Ontario Division, Havelock, has been appointed Assistant Superintendent, District 3, Ontario Division, vice F. G. Martyn, retired. Office, West Toronto.

H. A. PLOW, heretofore District Freight Agent, Ottawa, Ont., has been appointed District Freight Agent, London, Ont., vice L. Mulkern, transferred.

H. B. STEVENS, heretofore Chief Dispatcher, Sudbury, Ont., has been appointed Assistant Superintendent, District 1, Lake Superior Division, vice A. Williams, promoted. Office, Sudbury, Ont.

A. C. McLEOD has been appointed Assistant Trainmaster, District 1, Lake Superior Division, Sudbury, Ont.

E. P. BARKER, heretofore dispatcher, has been appointed Chief Dispatcher, District 1, Lake Superior Division, vice H. B. Stevens, promoted. Office, Sudbury, Ont.

D. C. MACDONALD, heretofore Division Freight Agent, Regina, Sask., has been appointed Assistant General Claims Agent, Western Lines, in charge of loss and damage freight claims. Office, Winnipeg.

T. F. MADDEN, heretofore of the company's New York office, has been appointed Travelling Passenger Agent, Steamships Department, Winnipeg.

D. BELL, heretofore clerk, Stores Department, Sutherland, Sask., has been appointed Storekeeper, Broadview, Sask., vice G. O. Jackson, transferred.

G. SANDSTROM, heretofore Roadmaster, Colonsay and Bulyea Subdivisions, Regina, Sask., has been appointed Roadmaster, Regina and Weyburn Subdivisions, vice L. Rimstead, deceased. Office, Regina, Sask.

L. B. COPELAND, heretofore Roadmaster, Regina Subdivision, Sask., has been appointed Roadmaster, Colonsay and Bulyea Subdivisions, vice G. Sandstrom, transferred. Office, Regina, Sask.

J. V. McNAB, heretofore Resident Engineer, Saskatoon, Sask., has been appointed Resident Engineer, Moose Jaw, Sask., vice R. C. Smith.

G. A. DELACHEROIS, heretofore transitman, District 4, Saskatchewan Division, has been appointed Resident Engineer, Districts 3 and 4, Saskatchewan Division, vice J. V. McNab, transferred. Office, Saskatoon.

G. O. JACKSON, heretofore Storekeeper, Broadview, Sask., has been appointed Storekeeper, Swift Current, Sask., vice V. B. Beardmore, resigned.

W. J. WOOD, heretofore foreman of lower floor, stores department, Ogden, Alta., has been appointed Storekeeper at Medicine Hat, Alta., vice A. Clark, transferred to Ogden as foreman of lower floor, stores department.

A. CLARK, heretofore Storekeeper, Medicine Hat, Alta., has been appointed foreman of lower floor, stores department, Ogden, Alta., vice W. J. Wood, transferred to Medicine Hat as Storekeeper.

H. FERGUSON has been appointed Assistant Purchasing Agent, Calgary, Alta., vice T. M. Barrett, promoted.

T. RIORDAN, heretofore Roadmaster, Red Deer Subdivision, Calgary, Alta., has been appointed Roadmaster, Calgary Terminals, vice J. N. Wiley.

D. H. FORD, heretofore Roadmaster, Laggan Subdivision, Calgary, Alta., has been appointed Roadmaster, Red Deer Subdivision, Calgary, Alta., vice T. Riordan, transferred.

A. LARSON, heretofore at Nelson, B.C., has been appointed Roadmaster Laggan Subdivision, Calgary, Alta., vice D. H. Ford, transferred.

H. B. WALKEM, M. Can. Soc. C.E., heretofore Assistant Division Engineer, British Columbia Division, Vancouver, is reported to have been appointed Engineer in Charge of Kootenay and Boundary Districts. Office, Nelson, B.C.

C. J. SIMMS, heretofore Assistant Division Engineer, Saskatchewan Division, Moose Jaw, is reported to have been appointed Assistant Division Engineer, British Columbia Division, vice H. B. Walkem. Office, Vancouver.

A. C. DOUGLAS has been appointed Purchasing Agent, Vancouver, B.C., vice A. J. Dana, retired.

A. G. VEITH has been appointed General Representative for Austria, with full charge and control of all matters in respect to the company's business in Austria, reporting to the European Manager, London, Eng. Office, Vienna.

ARVID JACOBSEN has been appointed General Agent in Norway, with office at Karl Johangst 1, Christiania.

Grand Trunk Ry.—JOHN MORRIS, heretofore acting Road Foreman of Locomotives, London, Ont., has been appointed Road Foreman of Locomotives, there, vice R. H. Fish, recently appointed Trainmaster.

New York Central Lines.—H. L. INGERSOLL, heretofore Assistant to Vice President, N.Y.C. & H.R.R., and L.S. & M.S.R., has been appointed Assistant to the President, New York Central Lines, New York. N.Y.

Midland Ry. of Manitoba.—A. CAMPBELL, chief clerk, Freight Department, Winnipeg, is reported to have been appointed Freight Agent there, vice C. H. Booth.

Northern Navigation Co.—See Canada Steamship Lines Organization in Marine Department of this issue.

Reid Newfoundland Co.—A. D. BROWN, heretofore Superintendent of Dry Dock, has been appointed Consulting Engineer. Office, St. John's, Nfld.

Salisbury and Albert Ry.—E. M. SHERWOOD, heretofore Assistant to the Manager, and station master, has been appointed Manager, vice A. Sherwood, resigned. Office, Hillsboro, N.B.

Toronto, Hamilton and Buffalo Ry.—H. T. MALCOLMSON, heretofore Car Accountant, has been appointed Superintendent of Car Service. Office, Hamilton, Ont.

Wabash Rd.—F. A. Delano has resigned as Receiver, leaving E. B. Pryor and W. K. Bixby as sole Receivers.

The Baffin's Bay Trading Co., Ltd., which has been incorporated under the Dominion Companies Act, with an authorized capital of $100,000 and head office at Toronto, has as its three directors A. W. Scott, of New York, President; W. W. Evans, Vice President, and W. L. Pinkney, Secretary. The two latter are in the Canadian Northern Railway's Legal Department. Mr. Scott has been carrying on explorations for minerals in the Baffin's Bay district for the past two years, and also trading with the Esquimaux. The company will take over his interests and will also probably go into fishing operations. It has two schooners among its equipment.

Safety First on the G.T.R.—At the first meeting of the Safety Committee in Montreal, Jan. 12, it was reported that 24 division, shop and terminal safety committees have been organized with a membership of about 600. During December, these committees corrected about 500 unsafe physical conditions, and cautioned employes in about 500 cases. A number of important recommendations of local committees were dealt with. Since the inauguration of the Safety First movement on the system, it was reported that injuries to employes had been reduced 11.5%, and fatal accidents to employes about 50%, as compared with the same period of 1912.

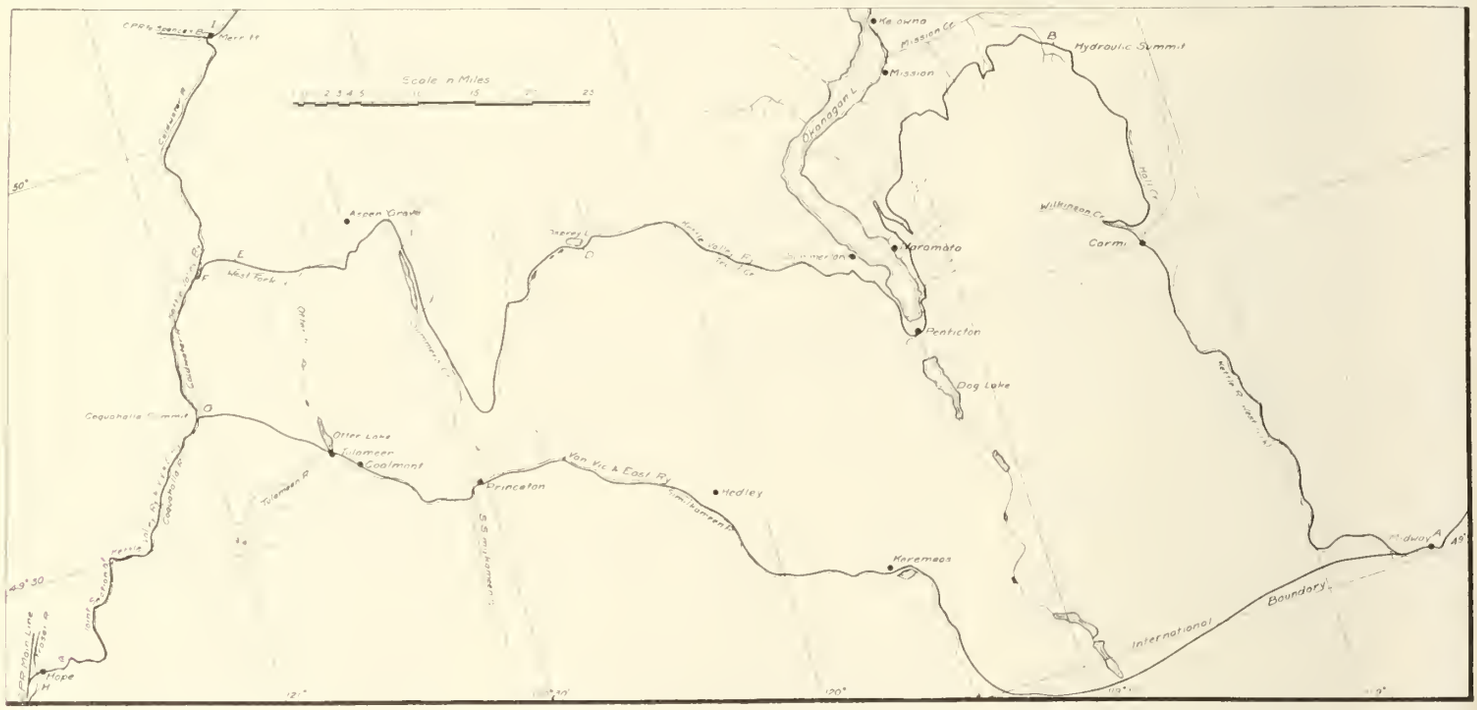
Proposed New Incline Railway in Hamilton.—The City Engineer submitted to the Hamilton, Ont., City Council, Dec. 29, an estimate for the building and equipment of a new incline railway to the top of Hamilton Mountain at Sherman St. The total cost is put at $247,200, of which $130,000 is for cars and machinery, and $25,000 for a 50 ft. steel span to carry the tracks of the Toronto, Hamilton and Buffalo Ry. across the route.

Kettle Valley Railway Construction, Etc.

The Kettle River Valley Ry. was incorporated by the Dominion Parliament in 1901, to build a railway from the International Boundary Line near Cascade City, B.C., along the valley of the Kettle River to Carson City, with a branch from near Grand Forks for 50 miles up the Kettle River Valley, and another by way of Greenwood to the International Boundary near Midway, B.C. The British Columbia Legislature also granted similar powers, and a charter was obtained in the State of Washington, for the building of a line from Cascade City to Republic, and from Republic by way of the San Port River Valley to Spokane. Under these charters the company built and put in operation in 1902 a line from Grand Forks, B.C., to the International Boundary, 3.91 miles, and from the International Boundary to Republic, Wash., about 15 miles. The building of the lines, both in Canada and in the United States, was not carried on without overcoming a good many difficulties, particularly in connection with the Great Northern Ry., which about the same time undertook active construction of the Vancouver, Victoria and Eastern Ry. Both lines were, however, built in the section along the boundary from Grand Forks westerly, the V.V. and E. Ry. running across the boundary at different points. The difficulty as to the projected extension southerly from Republic was ultimately settled by the withdrawal of the G.N.R., but the line is as yet only a projected one. In the vicinity of Midway, B.C., another difficulty was encountered in connection with C.P.R. proposals for a line through the same country, and by the commencement of active construction by the Midway and Vernon Ry. After having completed several miles of grading this company ceased work and abandoned its undertaking, and after lengthened negotiations an agreement was reached with the C.P.R., by which future construction was to be done by the K.R.V. Ry., the name of which had been changed to the Kettle Valley Ry., to conform with the title under which the lines were operated—the Kettle Valley Lines.

Some extensions were subsequently built in Canada, and in 1910 the company had in operation about 40 miles of line in Canada and the United States. In that year an arrangement was made under which the B. C. Government granted subsidies for building the following lines:—From Grand Forks for 30 miles along the valley of the North Fork of the Kettle River; from Midway to Penticton, and from Penticton to Merritt, effecting a junction there with the Nicola, Kamloops and Similkameen Ry., a branch of the C.P.R. Work was started on these lines almost immediately, the act providing that the work done by the Midway and Vernon Ry. should be taken over. The cost of this work between Midway and Rock Creek was ascertained by a commission, and the amount was paid to the creditors of the old company by the Government, out of the sum provided by the subsidy. In 1912 an extension of the line was granted for construction, and an agreement was entered into for further construction, viz.: for a line from 25 miles south of Merritt, along the Coldwater River Valley to the Fraser River to Hope, 50 miles, under a guarantee of bonds, and for the building of a bridge, for which $200,000 was provided, across the Fraser River, so as to enable a connection to be made with the C.P.R. In regard to this 50 miles of line a controversy arose with the V.V. and E. Ry., as to the route to be adopted, and after many surveys had been made and much negotiating, it was arranged that a joint line should be built by the K.V.R., for 39.2 miles, the cost to be equally divided between the two companies, the section to be operated jointly. The agreement provides that no subsidy shall be paid in respect of the line from Midway to Penticton; that the subsidy for the line from Penticton to Merritt shall be $5,000 a mile, payable in cash or in 3% inscribed stock of the Province at the option of the Government, the mileage guaranteed is not to exceed 150 miles; the subsidy on the line from the Coldwater River to Hope is at the rate of $10,000 a mile, not to exceed 50 miles. The actual mileage of the located line from Penticton to Merritt is 134 miles, and from the Coldwater River to Hope, is 52.3 miles. The lines mentioned in the 1910 agreement are to be completed in 1914, and the Coquihalla line in 1915.

The line as located from Midway to Merritt is 267.8 miles long, and the Coquihalla line from near Merritt to Hope, is 52.3 miles, making a total mileage of 320.1 being constructed under the two agreements. With the exception of the section D. W. E., Osprey Lake to Otter Creek Summit, 65.5 miles, the entire line is under contract, and construction is well advanced. The accompanying plan shows the route being followed from Midway to Merritt, and along the Coldwater River Valley to Hope, with the connecting lines. The V.V. and E. Ry. runs west through Princeton, and is now in operation as far as Coalmount. It is under construction through Tulameen to the point where section G. H. starts, this being the joint section. At Hope the V.V. and E. will connect with its own line now in operation easterly from Vancouver and Port Guichon through New Westminster. We are officially advised that the state of construction at Dec. 31, 1913, showed 254.66 miles under contract, on which 213 miles of grading had been completed, 163.1 miles of track had been laid, and 104.5 miles of ballasting completed. The following statement shows in detail the work done on the several sections, with the names of the contractors:—



Kettle Valley Railway Map, Showing Construction.

Section A to B.—Midway to Hydraulic Summit, 75.6 miles. Grading and bridging completed, track all laid, 67 miles of ballasting completed from Midway. Contractors for grading and bridging, L. M. Rice and Co.

Section B to C.—Hydraulic Summit to Penticton, 58.2 miles. Grading 95% done; bridging 12% done; track laid for eight miles from Hydraulic Summit; no ballasting. Contractors for grading and bridging, Grant Smith and Co.

Section C to D—Penticton to Osprey Lake, 39 miles. Grading, bridging and track laying completed, ballasting done for 10 miles from Penticton west. Contractors for grading and bridging, L. M. Rice and Co.

Section D to E.—Osprey Lake to Otter Creek Summit, 65.5 miles. Contract not yet let.

Section E to I.—Otter Creek Summit to Merritt, 29.5 miles. Grading, bridging, track laying and ballasting completed. Contractors for all work, McDowell, Gzowski and Co.

Section F. to G.—Coquihalla line, 12.8 miles. Grading and bridging completed, track laid 11 miles, ballasting done eight miles, from F. Contractors for grading and bridging, Twohy Bros.

Section G. to H.—Coquihalla line second contract, 39.5 miles. Grading 8% completed. No other work done. Contractors for grading and bridges, McArthur Bros.

A. McCulloch, Penticton, B.C., is Chief Engineer.

The Dominion Parliament is being asked to ratify the agreement with the Vancouver, Victoria and Eastern Ry., respecting the Coquihalla joint section; to extend the time for the building of the lines authorized by pars. a., b. and c. of sec. 2, chap. 110 of the statutes of 1912, and to authorize the building of an additional branch from near Otter Summit to Aspen Grove mineral district, 30 miles.

The company is making application to the Dominion Parliament for an extension of time for the building of its several lines, for the ratification of the agreement with the Vancouver, Victoria and Eastern Ry. re the construction of the Coquihalla-Hope line, and for the building of some additional lines. (Jan., pg. 21.)

Railway Companies May Refuse Shipments "to Order" at Flag Stations.

D'Arcy Scott, Assistant- Chief- Commissioner, Board of Railway Commissioners, gave the following judgment in Ottawa, Jan. 8.

W. G. McMahon, of Winnipeg, has brought to the Board's attention the practice of railway companies of refusing to take shipments, either c. l., or l. c. l. to flag stations, when consigned "to order." As a railway company has no agent at a flag station to guard the property pending proof of ownership by the production and surrender of the endorsed bill of lading, it is quite justified in refusing to accept shipments to flag stations when consigned "to order." This question was set down for the sittings at Ottawa on Oct. 23, 1913, for discussion with the railway companies; the Canadian Pacific, Grand Trunk, Canadian Northern, and Michigan Central, the Canadian Freight Association being notified. After hearing what was submitted by the C.N.R. and the G.T.P.R.—the other parties notified not appearing—the matter was reserved.

It would be convenient in many cases, to both shippers and consignees, if some arrangement could be made to provide for shipments consigned "to order" being sent to flag stations. They cannot be sent direct to flag stations; but such shipments might be consigned to the nearest regular station short of the flag station and the consignee notified, his address being given in the shipping order by the shipper for this purpose. He could then send the endorsed bill of lading and the freight charges, if any, to the company's agent, or produce them in person, and the goods could then be sent on from the regular station to the flag station. For the re-consignment from the agency station to the flag station, in the case of l. c. l. shipments, it would be fair to permit the railway company to collect the local rate. It must be remembered that the railway company would have to perform a special service, and it should be paid a fair amount for it. The goods upon reaching the regular station, in the case of l. c. l., would have to be unloaded into the freight house and left there until the consignee sent, or called with, the endorsed bill of lading. The goods would have to be then re-loaded and again unloaded at the flag station. I think in such cases, the local rate from the billing point on to the flag station would be fair remuneration to the railway company.

In the case of carloads, the unloading and re-loading mentioned in the case of l. c. l. would, of course, not have to be done. The car would be put on the siding and left there, and the consignee notified. Then, when he had done what was necessary to release the car, it would be picked up by a way freight and left at the flag station. It seems to me that for this service, the rate should be the through rate to the flag station, plus a $3 additional charge for the extra terminal service and for rebilling. This is the general charge which the Board approved of for a somewhat similar service by order 6901, April 16, 1909, and it seems to me it would be fair remuneration to the railway companies for the additional service they would have to render in the present case. A detention allowance of 48 hours from the time of the dispatch of the notice of the arrival of the car by the agent to the consignee, should be sufficient for the surrender of the endorsed bill of lading at the agency station, after which the carrier will be entitled to charge and collect the authorized demurrage toll for each adtional 24 hours (or part thereof) of detention, over and above the $3 terminal service charge.

The following general order 118 was issued Jan. 15:—

1. That railway companies accept freight consigned "to order," for delivery at flag stations, provided that the shipper consign the freight to the regular station of the delivering carrier on the direct route, nearest to, but short of, the flag station where delivery is desired; That said shipper show on his shipping order the full address of the person to be notified of the arrival of the freight at the regular station, and the name of the flag station at which delivery is desired.

That the said addressee be given 48 hours, exclusive of legal holidays, from the time of the dispatch to him of the arrival notice, within which to give the agent in whose care the goods are held the endorsed bill of lading and directions for re-shipment to the flag station, lawful demurrage or warehouse storage, as the case may be, to be chargeable after the lapse of the said time allowance for any further delay in furnishing the bill of lading and directions.

That the additional charge for the further carriage from the said regular station to the flag station be the lawful local rate between the said stations in the case of less than carloads, and $3 a car and the balance (if any) of the through rate from the original point of shipment, in the case of carloads.

Railway Construction in Progress.

It is estimated that during 1913 the various Canadian railways had under construction in one stage or another about 6,500 miles of new lines. Of this, about 2,000 miles was reported to have been placed in operation by June 30, the end of the statistical year, and since that date a considerable further mileage, probably another 500 miles, has been handed over to the operating department. This leaves about 4,000 miles of line actually under contract and in process of construction from the grading stage to the line on which track has been laid and the finisning up processes in progress. It has been estimated that at the end of the last construction season, the Canadian Northern Ry. had in hand over 1,500 miles of lines, the C.P.R. about 1,000 miles, the Grand Trunk Pacific Ry. about 1,000 miles, and the Dominion Government line to Hudson Bay, about 500 miles, making a total of about 4,000 miles of new lines actually in process of construction.

In addition to the work in hand, the C.N.R. and the G. T. Pacific Ry. have in contemplation the construction of a considerable mileage of new lines in the West. Just where these lines will be, and what mileage will be put under contract during this year, has not yet been decided. This matter rests largely with the Governments of Saskatchewan and Alberta, as these two companies are under contract to build large mileages in both provinces under Government guarantee. If it were possible to finance all the construction asked for in these provinces at present, well on to 5,000 miles of new lines would be at once put under contract. The C.P.R. expenditures for the current year are almost entirely confined, so far as the western provinces are concerned, to the completion of track laying on the mileages of grading completed, and upon further stretches of second track work. Any new work to be started this year will be decided upon later. On the eastern lines the same policy is being pursued, the only construction at present contemplated being a further stretch of second track work west of Guelph Jct., and further stretches of second track between Sudbury and Port Arthur. The actual mileages of this work have not yet been settled.

Outside these three lines, the future new construction programmes are not arranged. The opening of the next construction season will see put in hand the Alberta and Great Waterways Ry., 350 miles, for which the J. D. McArthur Co. has the contract; and the remaining section of the Pacific Great Eastern Ry. in B.C., for which Foley, Welch and Stewart hold the charter in conjunction with G. T. P. Ry. interests. There is also the final contract to be let on the Kettle Valley Line, about 50 miles.

In Eastern Canada, the most important work under construction is the Canadian Northern Ontario Ry. line from Montreal to Port Arthur. Tracklaying has been completed between Port Arthur and Ruel, and the section of the line from Ruel to Capreol has been in operation for some time. Track has been laid altogether on 155 miles from Ottawa towards Capreol, and on practically all the Montreal-Hawkesbury-Ottawa section. The total length of this line, for which the Dominion Parliament voted a guarantee of bonds and other assistance, is 1,050 miles, of which the only portion on which track has not been laid is the 150 mile section between the present track end northwesterly from Ottawa and Capreol.

The C.P.R. has under construction considerable work between Romford Jct. and Port Arthur, Ont., in the way of diversions, lengthened sidings, etc., with a view of completing a second track.

Outside these works and the finishing up of the National Transcontinental Railway, there is, so far as we are advised, but little new construction in sight. Including the Nelson-Derby Jct. diversion, and the St. Romuald-Chaudiere second track on the Intercolonial, and a three mile revision on the Temiskaming and Northern Ontario Ry., there are less than 100 miles of new line under contract ; about a similar mileage under survey, and about 700 miles of new lines projected. There are, in addition, several lines which have completed surveys for considerable mileages, such as the Canada Gulf and Terminal Ry., the Quebec and Saguenay Ry., the Joliette and Manuan Colonization Ry., and the Central Ry. of Canada, and which have done some construction, but which at present are marking time.

Cedar Crib and Trestle Construction on the Ruskin-Stave Falls Line in B.C.

An example of the extent to which rough timber can sometimes be used in the construction of railway spurs of temporary lines is given in the recently completed extension of the Ruskin-Stave Falls line in British Columbia. About 230,000 ft. b. m. of hewed and rough timber were used in crib and trestle work on this extension, which is 3,300 ft. long and cost about $20,000. It was built for hauling cement and other materials to the top of the present intake dam of the Western Canada Power Co., where extensive alterations are contemplated.

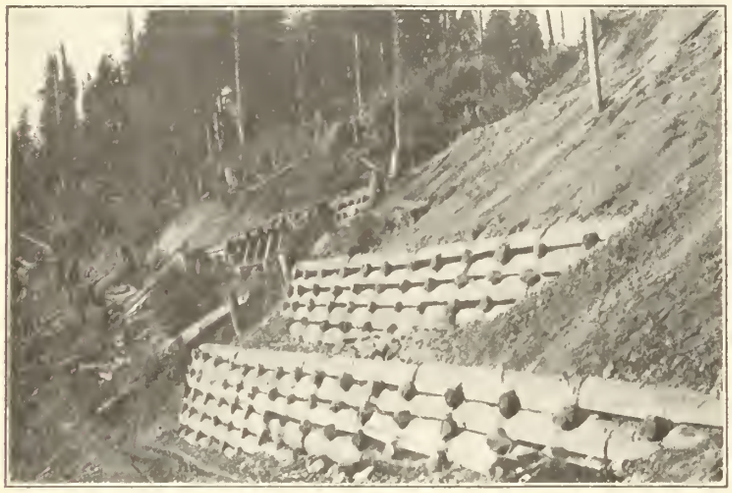
The line follows along a very steep sidehill in loose, sliding earth and required a large amount of retaining wall construction. The heavy timber growth was, therefore, utilized to good advantage, and cribs and trestles were built from cedar timber cut on the right-of-way or adjacent thereto. The cribs were built up as grading progressed, and in some of the longer and steeper slopes it was found convenient to terrace them in one or more sections. Several trestles were required at ravine crossings; and in order to give greater stability to these structures, timber crib foundations were built wherever the footings came on sloping ground. The road is of standard gauge and was built on a uniform grade of 5%, compensated, with a maximum curvature of 15 deg.

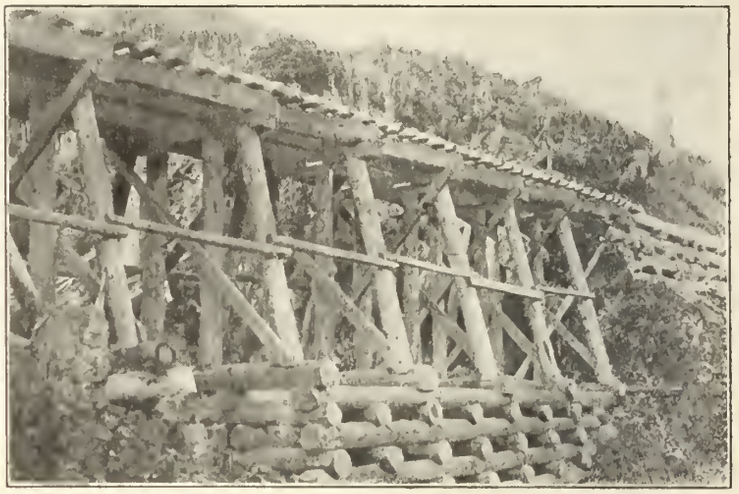
A typical trestle on crib foundation is shown in one of the accompanying illustrations. The timber in this trestle totals 59,000 ft. b. m. Including engineering supervision, the structure cost $975.75. The amount of timber used in this trestle, if bought from the mill as dimension lumber at the regular rate of $20 per 1,000 ft. b. m. would have come to $1,180, while a probable additional cost of $650 for erecting would have brought the total up to about twice the amount actually expended on the structure.

The timber crib shown in the other illustration contains 41,000 ft. b. m., and cost in place $970, or about $24 per 1,000 ft. b. m. This cost is considered somewhat higher than the average on the work, due to the very soft earth encountered at this point. In making a fill near the lower end of the line a rough timber trestle 600 ft. long with an average height of 28 ft. and a maximum height of 32 ft., was built at a cost of $2 a foot, including ties and 56 lb. rails. This structure was only used until the fill was graded for permanent roadbed and its heaviest loading was a 12-ton dinkey engine with three 6-ton (loaded) dump cars.

The extension of the Ruskin-Stave Falls line is being made by day labor by the Western Canada Power Co. under the direction of R. F. Hayward, Chief Engineer, and the personal supervision of J. F. Cahan, Construction Engineer.—Engineering Record.

Canadian Railway and Marine World is indebted to Mr. Cahan for the photographs from which the two illustrations above referred to were made. We are also indebted to him for the photograph showing a derrick which he had rigged up, put on a flat car and used for excavation of the penstocks and foundation of the additions to the power house. The derrick, of about 12 tons capacity, has, Mr. Cahan says, proved cheap and efficient and of the utmost service, both on excavation and for handling stop logs, structural steel, etc.





Cedar Crib and Trestle Construction on Ruskin-Stave Falls Line in British Columbia.

Derrick on Flat Car, Ruskin-Stave Falls Line.

Michigan Central Rd. Assessment.—The difference between the Windsor, Ont., City Council and the Michigan Central Rd., respecting the assessment of the Detroit River Tunnel within the city limits, has been settled. The agreement provides for a fixed assessment of $1,000,000 for 15 years, and the company's lands in the city are to be assessed at $450,000 for a similar period.

C. P. R. Physical Assets.—The daily press has recently given publicity to a statement that the C.P.R. has had a valuation made of its physical assets, and in that connection a number of figures were given which are more or less inaccurate, and certainly misleading. The item may be described as the invention of an irresponsible writer, who has, presumably, abstracted figures from the company's annual report without due knowledge of their proper significance. No valuation as reported has been made.

Compound vs. Simple Locomotives.—Comparative tests on two 4 cylinder Pacific locomotives on the Paris, Lyons and Mediterranean Ry. (France), one of which was a simple and the other a compound, working under exactly similar conditions, are reported to have shown that the compound will haul a 16% greater load, reach a higher speed and accelerate more rapidly. The saving in coal and water was respectively 20% and 13%. The tests extended over 4 years.

After the finding of the Board of Railway Commissioners, in the matter of Western railway freight rates, has been issued, the enquiry into telegraph rates will be taken in hand, when the various telegraph companies will be requested to present replies to the Government counsels' factum in the matter.

Electric Railway Department

British Columbia Electric Railway Co.'s Annual Report.

Following are extracts from the report for the year ended June 30, 1913, presented at the annual meeting in London, Eng., Dec. 19:—

The year covered by the report was one of difficulty and disappointment, mainly owing to the continued rise in the cost of operation and in the cost of all descriptions of supplies. Increased working expenses absorbed practically the whole of the large increase in gross earnings, in spite of continuous effort on the part of the management to economize. One of the causes of the increase in expenses was the protracted and stubborn strike in the coal industry which existed throughout the year, resulting in a considerable rise in the cost of coal, and necessitating the purchasing of supplies in the United States and in Australia. The expensive working conditions still continue and are affecting the current year's earnings. Moreover, the gross receipts of the railway have fallen off owing to the depression which is prevalent in British Columbia. The directors have undiminished faith in the future of British Columbia, and consequently of the company, and meanwhile have confidence that, by a small increase recently made in fares and by rigid economy, they will be able to maintain the present dividend basis.

For the 12 months to June 30, 1913, the gross receipts show an increase of $1,035,869, or over 17%, and the net earnings, including income from investments and subsidiary companies, and after charging renewals, show an increase of $77,552, or 4%, over the preceding year, but the surplus over the amount required to pay interest and dividends has failed from £67,670 to £28,242. The money actually expended up to June 30, 1913, amounted to $45,168,312, and the amount paid out in interest and dividends for the year amounted to $1,888,139, equal to 4.18% on the entire investment. The following charges have been made against the revenue account of the year, viz.:—

Provision for renewals maintenance (from which £40,102 16s. 8d. has been deducted for adjustments and expenditure on renewals during year)		£140,653 13 3	
Amount added to capital amortization		2,360 17 7	
			£143,014 10 10
Net profit for year, after making above deductions		£381,424 12 2	
Add balance brought forward from last year		7,731 19 7	
		£389,156 11 9	
Interest on debentures and debenture stock to June 30, 1913	£125,182 3 2		
Dividends already paid—			
On 5% cumulative perpetual preference stock for year to June 30, 1913	60,000 0 0		
On preferred ordinary stock for year to June 30, 1913	72,000 0 0		
On deferred ordinary stock for six months to Dec. 31, 1912	48,000 0 0		
		305,182 3 2	
Leaving available for further distribution and reserve		83,974 8 7	
From this the directors have recommended the payment of a dividend on the deferred ordinary stock at the rate of 8% per annum for the six months ended June 30, 1913, making 8% for the year	£48,000 0 0		
To transfer to reserve fund	26,455 9 3		
		74,455 9 3	
To carry forward to next account		£9,518 19 4	

There has been added to the reserve fund £67,544 10s. 9d., representing the premiums by which the price paid into the treasury exceeded the par value of £1,320,000 new share capital issued during the year, less expenses thereon, and after deducting the expenses and discount on an issue of £750,000 4¼% debenture stock issued in Jan., 1913. After the transfer now recommended by the directors as above, the reserve fund will amount to £553,000.

The growth of the company's enterprise is indicated by the following figures:—Miles of single track in operation—1909, 97.74; 1913, 357.82. Total cars of all classes—1909, 248; 1913, 873. The number of passengers carried during the year was 71,973,822, an increase for the year of 9,819,656.

In the monthly statements of earnings issued since July 1, 1913, the actual profits of the subsidiary companies have been included in the total income. Owing to the practical completion of the hydro electric installation at Lake Buntzen, it is now possible to ascertain with accuracy the cost of power. In the past the price charged to the railway for power by the Vancouver Power Co. had to be fixed somewhat arbitrarily, owing to the continually varying amount of the capital invested in the hydro electric installation. The railway has benefited at the expense of the power company, as the price charged was too low. This accounts to a large extent for the apparently unsatisfactory yield obtained by the company in the past from its investment in its subsidiaries.

In June last two of the directors, Messrs. Brown and Harvey, visited British Columbia, and during a stay of nearly three months thoroughly investigated existing conditions and future prospects. They report very quiet conditions of trade in the province, and a noticeable reaction from the progressive prosperity, which has been so marked a feature of the past ten years. They believe that the existing depression is almost entirely due to the prevailing stringent monetary conditions and that it will be dispelled by the return of confidence in Canadian undertakings and in the stableness of the market for Canadian securities, resulting from the continuous adoption of careful methods of finance.

The dam and other works at Lake Coquitlam, which have been under construction for three years, were completed in July last. The satisfactory construction of these works reflects the highest credit on G. R. G. Conway, the Chief Engineer, and on his assistants, and the directors are glad to take this opportunity of publicly acknowledging their valuable services. The completion of this dam marks an important epoch in the company's history, providing an available reserve of over 57,000,000 k.w.h. of electrical energy. With the power secured from the Western Canada Power Co., the company is now placed in an exceedingly strong position in this respect. The new power house at Lake Buntzen has been completed, and the first of the three additional units to be installed therein is now in operation. The erection of the second and third units is being considerably delayed, owing to the difficulty of obtaining deliveries from the manufacturers, but it is anticipated that these units will be in operation during the early part of 1914. A satisfactory contract has been entered into with the Western Canada Power Co., under which the company agrees to purchase a gradually increasing amount of power during the next 20 years. The extension of the Jordan River hydro electric power installation has been proceeded with during the year. To secure the necessary water storage for supply to the additional units a permanent reinforced concrete dam has been completed. By the completion of this dam the total maximum available water storage is increased to 927,900,000 cu. ft., equivalent to a reserve of approximately 14,500,000 k.w.h. of electrical energy. The electric plant at Jordan River has at present a capacity of 12,000 h.p. A third unit is in course of installation, bringing up the capacity to a total of 25,000 h.p. which is required to meet the demand in the City of Victoria and the surrounding districts. During the year the installation of the auxiliary steam plant, which at the date of the last report was under construction at Brentwood Bay, 12 miles from Victoria, has been completed and has a present capacity of 6,000 h.p. The plant has been designed on the most modern lines, and is held in reserve to meet the possible emergency of a breakdown in the company's other power plants on Vancouver Island.

In June last the new Saanich suburban line was formally opened for traffic. The line, approximately 23 miles long, runs as nearly as may be through the centre of the Saanich Peninsula, and opens a very fertile tract of country hitherto without satisfactory connection with the City of Victoria.

The directors again have pleasure in expressing their appreciation of the loyal and satisfactory services rendered by the management and staff in British Columbia.

The following capital account expenditures were made during the year:—

Rolling stock	$1,068,984.16
Permanant and double tracking and sundry improvements	556,479.97
Track extensions	781,235.89
Lighting extensions	350,128.42
Power extensions	146,008.58
Steam plant	72,614.06
Lands and buildings	1,097,312.32
Electrical machinery	308,944.71
Extending light and power system	330,711.18
North Vancouver—rolling stock, meters, transformers, and initial installations	30,864.98
Sundries	144,990.54
Transmission lines and railway feeders	134,139.00
	$5,022,413.91

Montreal Tramways Company's Service.

The M.T. Co., it is reported, has now about 200 more cars in service than it had at the same time last year. J. E. Hutcheson, General Manager, is reported to have stated that additional cars are being received at the rate of six a week. Special attention is being paid to the matter of overcrowding of the cars, and it is claimed that this will be considerably minimized by the substitution of new cars for a number of the older ones at present in service. The new cars have accommodation for 44 passengers, against 28 in the older ones.

All the cars are being repainted, green having been adopted as the standard color for city cars, and yellow for the suburban ones. On the new cars, signs will indicate both the destination and route, but it is stated that it is not likely that this method will be adopted on the other cars at present.

Prepayment Trailer Cars for Hull Electric Company.

Four prepayment trailer cars have been ordered by the Hull Electric Co. for service on its interurban line between Ottawa, Ont., and Hull and Aylmer, Que., to be delivered in March, to meet the spring and summer traffic. They will be of the single end type, somewhat similar to the trailer recently ordered by the Montreal Tramways Co. for the heavy service on its St. Catherines St. line. The general dimensions are as follows:—

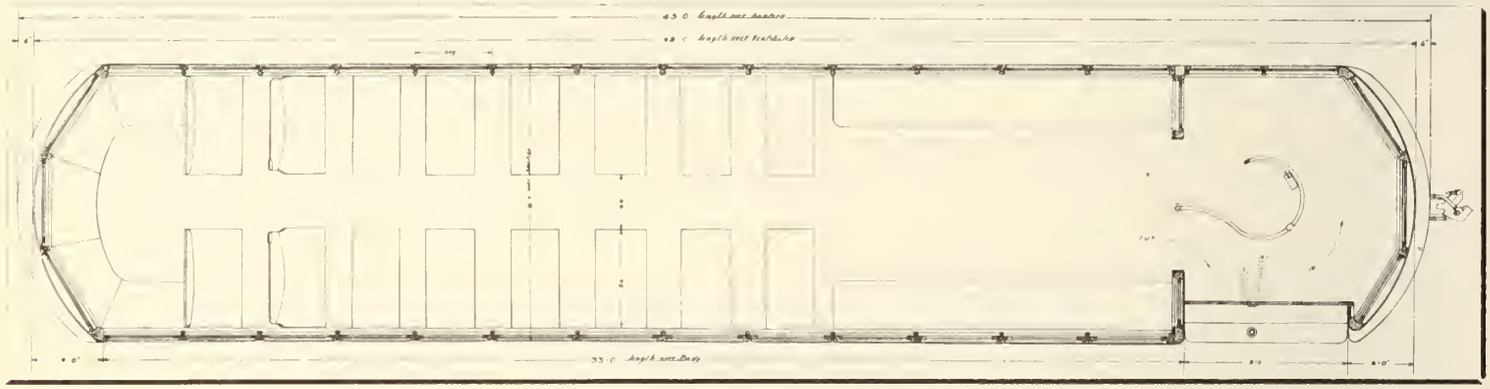
Length over bulkheads	42 ft.
Length over bumpers	43 ft.
Length over body	33 ft.
Width of body over sheeting	8 ft. 6 ins.
Width of body inside	7 ft. 8 ins.
Height of body from bottom of side sills	8 ft. 9 ins.
Side posts, centre to centre	30¼ ins.
Length front vestibule	7 ft.
Length rear vestibule	2 ft.
Width of aisle	22 ins.
Length of seats	36 ins.
Seating capacity	54

The underframe will be of a composite wood and steel construction, with the sill running in one piece through the car from bumper to bumper. The cross stills will be of oak mortised and tenoned into the longitudinal sills, the whole being tied together transversely with ⅝ in. steel tie rods, with a thread and nut on each end. The centre of the frame will be supported by two needle beams, suspended on two 1⅛ in. steel truss rods. The flooring will be of hard pine, laid in a double thickness, with heavy builders' tarred paper between. The bumpers will be of 6 in. heavy steel channels, rigidly secured to the ends of the main sills with angle plates. The bolsters will be of the standard half diamond type.

The upper body construction will be of the standard interurban car type, with monitor roof and lifting sashes in the sides. The interior finish will be in natural color cherry, excepting the ceilings, which will be of agasote board, painted. The seats will be of a standard type, covered with rattan, and non reversible. The window curtains will be of pantasote material, with all steel rollers. All interior fittings, such as grab handles, door locks, sash lifts, etc., will be in solid bronze, of a modern design, and polished. The entrance and exit doors will be equipped with automatic folding doors, controlled by the conductor from his position.

The cars will be equipped with trailer trucks, which have been ordered in the United States. Westinghouse schedule s.m.e. air brakes, Westinghouse combination car and air couplers, hand brakes, Consolidated Car Heating Co.'s electric heaters, interior electric light fixtures, standard M.C.B. tail lamps, steps, and brass railings for the prepayment arrangement.

The cars, which are being manufactured by the Ottawa Car Mfg. Co., will be of practically the same design and general dimensions as the motor cars by which they will be hauled, so that together they will form a neat working unit.



Prepayment Trailer Car for Hull Electric Co.

The Ontario West Shore Railway Muddle.

The Ontario Railway and Municipal Board has continued its enquiry into the methods employed in the promotion and construction, and subsequent abandonment of the Ontario West Shore Ry., a portion of which was built between Goderich and Kincardine. Canadian Railway and Marine World has already published details of what has been done in regard to construction, the bond guarantees of certain local municipalities, and the report of the Engineer of the Ontario Railway and Municipal Board on the present state of the road. The municipalities and the amounts of bonds guaranteed, are as follows,— Goderich, $150,000; Kincardine, $50,000; Ashfield Tp., $125,000; Huron Tp., $75,000. The total amount of bonds issued is $600,000, the guaranteed portion of the issue realizing $385,000. This was deposited with a trust company and paid out upon certificates of the engineer in charge of construction. The construction showed 16 miles of rails laid and 6 miles graded, as far as Amberley, and rails lying on the road from Amberley to about 4 miles short of Kincardine. The Board's Engineer, H. W. Middlemist, after careful examination of the work, reported that work to the value of about $260,000 at the outside had been done, and that the road in its present condition is absolutely useless. The unguaranteed bonds, amounting to $200,000, are it is stated, held by a bank against an advance of $60,000 to the promoter.

J. W. Moyes, the promoter of the railway company, and also of the Huron Construction Co., which had the building contract, blamed the Ontario Government hydro electric power scheme for the collapse of the railway project, as it had been the company's intention to develop the water power of the Maitland River, for the purpose of running the railway, and for the local supply of light and power. He stated that the Government scheme cut off this possibility, and without the extra revenue thus anticipated, the railway could not pay. He also stated that he ceased to be President of the railway company in June, 1913, and at that time handed all the papers and minute books to the company's Solicitor, S. C. Smoke, (since deceased). At a former sitting of the Board, the engineer in charge of construction had stated that the cheques for $385,000 for work done, were signed on Mr. Moyes' instructions.

D. M. McIntyre, Chairman of the Board, commented very strongly on Mr. Moyes' failure to furnish information as to how $385,000 had been spent on the partial construction of the road, and demanded an explanation of the matter. This, Mr. Moyes stated he would supply, but that certain books and papers, which he claimed to have handed to the company's Solicitor, were missing.

A development of this point took place a few days later, when a search warrant was applied for on behalf of J. W. Moyes, to search certain premises, when a trunk and a parcel, said to contain the missing papers, were recovered from the house named in the warrant, but no reason as to why they were being held, how they came into the person's possession, or what they were, has been given. The trunk and parcel were subsequently produced before the Board. At the resumed hearing a doctor's certificate was handed in, stating that Mr. Moyes was for the time, mentally and physically unfit to attend, or to prepare the statement of the expenditure, as promised. The Chairman again pointed out the seriousness of the matter, and how necessary it was that Mr. Moyes should clear his position. After some discussion it was decided that the trunk and parcel, above mentioned, would be opened in private, and all papers therein relating to private affairs taken out and handed to Mr. Moyes, and all papers pertaining to the Ontario West Shore Ry. would be retained by the Board, and dealt with later. At the Board's sitting, Jan. 21, it was announced that $180,000 of the unguaranteed bonds were deposited with a bank, July 23, 1908, and of these $165,000 were delivered by the bank to J. W. Moyes, Nov. 10, 1913, the balance remaining in the bank. The balance of the $200,000 of unguaranteed bonds are held by a trust company as security for an account, and instructions have been given that they are not to be disposed of pending the result of the present enquiry. An accountant is being engaged to examine the books of the railway and construction companies.

Toronto Civic Car Lines Results.

Following are the number of passengers carried and the receipts of the Toronto Civic Car Lines in 1913:—

	Passengers.	Receipts.
St. Clair Ave., opened Aug. 25.	1,150,426	$19,672.29
Danforth Ave., opened Oct. ...	517,024	8,841.11
Gerrard St., operating all year.	1,697,268	29,023.28
Total	3,364,718	$57,536.68

Omnibusses in Winnipeg.—A draft bylaw embodying an agreement made between the City Council and the Winnipeg Motor Transit or Bus Co., has been prepared, and is under consideration. It provides for a five year franchise, with a possible extension for another five years, the council to have the right to take over the service at the end of the five year period.

The Street Railway Situation in Toronto.

Although the question of the proposed purchase of the Toronto Ry., with its allied company, the Toronto Electric Light Co., was not before the ratepayers at the municipal elections on Jan. 1, the voting was doubtless considerably affected thereby. The Mayor, H. C. Hocken, who was chiefly responsible for bringing the matter to the fore, and who conducted, on behalf of the city, the negotiations with the President of the company regarding the proposed purchase, was re-elected. Under ordinary circumstances Mr. Hocken would either have secured his second term by acclamation, or by a very large majority, but as a result of strong opposition to the proposed purchase his majority was only 4,577 out of a total of 43,095 votes polled. Alderman McBrien, who entered the field only a few days before the nominations, as a straight anti purchase candidate, polled 16,641 votes and Alderman Burgess, who also opposed the purchase, got 3,725 votes, the other 1,511 going to a Socialist candidate. Of the four members of the Board of Control elected, two announced themselves in favor of and two against, the purchase, while of the aldermen, a majority were in favor of the purchase during their candidature. In view of the popular vote, however, some of them may have changed their minds.

It is probable that at the next session of the Ontario Legislature, application will be made by the city, for authority to appoint a commission to be placed in charge of the civic transportation problems. The idea is to appoint to the commission, three well known local men, without salary, for a term of four years, but at the commencement, one would be appointed for two years, one for three years and one for four years. No member of the city council, nor any civic official would be eligible for appointment, and on the expiry of the term for which any member was appointed, he would be eligible for reappointment.

W. P. Gundy, President of the Toronto Board of Trade, in his address to the members, Jan. 19, stated that he was opposed to the proposed purchase on the terms proposed, and gave details of what might be termed an alternative scheme, which he believed would clear up the whole matter and avoid numerous complications which he feared would result if the present proposals were carried out. He said:—

"I believe that in order to obtain a complete clearing up of the whole situation, and a proper solution of the transportation difficulties, the Province of Ontario and the City of Toronto should unite on terms to be agreed upon between them in purchasing the stock of the Toronto Ry. Co. (if at a satisfactory price, and not otherwise) and thus secure control not only of the Toronto and York Radial Ry., consisting of the Metropolitan line, from North Toronto to Lake Simcoe; the Scarboro line, east from Woodbine along Kingston road; and the Mimico line, from Sunnyside to Port Credit. The Toronto Ry. Co. does not own the Toronto Suburban Ry., which holds the franchise in Ward 7, and operates lines of railway along Davenport Road, also from West Toronto to Lambton and from West Toronto to Weston. This Toronto Suburban Ry. is, however, owned by the Mackenzie interests, and it would be essential to include this line also. Under such a plan as I have outlined the Ontario Hydro Electric Commission, representing the Ontario Government, would retain for its own use the Electrical Development Co. and the transmission lines of the Toronto and Niagara Power Co., including the right of way between Toronto and Niagara Falls, and the radial railways, and hand over to the City of Toronto all the property within the city. This, I believe, would be a complete clearing up of the whole situation in the City and Province, as it would avoid giving running rights for radial lines over the city streets to Sir William Mackenzie, which is one of the serious objections to the plan now before the people."

Reference to Canadian Railway and Marine World for May, 1913, pg. 238, will give the list of the companies which would be involved in such a scheme, with their capital stock, bond issues and interlocking connection with each other, with the exception of the Toronto Suburban Ry. Co., which although controlled by the Mackenzie interests, is a separate organization.

The draft agreement which the City Council instructed the Corporation Counsel to draw up recently, embodying the terms of the proposed purchase, which were the outcome of the recent negotiations, is reported to have been prepared and to be ready for submission to the city council.

The President of the Board of Trade, in his remarks quoted above, stated that the acquirement of the whole series of companies, would, among other things, "avoid giving running rights for radial lines over city streets, which is one of the serious objections to the plan now before the people." The original draft agreement, on which the negotiations between the Mayor and Sir William Mackenzie were based, provided, on this point, for the taking over by the city of such of the radial lines as were within the present city limits, the double tracking of such lines by the city, and the granting of running rights to the radial companies concerned, over such lines, the city to lay a third rail, if it desired to operate over these lines in connection with the city lines. If, therefore, the final draft agreement follows on the lines of the original one, there is no question of the radial lines operating over city streets other than at present. In fact they could not do so if it was so desired, unless the whole city system were rebuilt to standard gauge. Such a clause however, if included in the final agreement, would bind the city to retain the present radial lines within the city limits, at standard gauge, and also any other portions of the radial lines as may be included in the city by any future extension of boundaries. Thus, city cars could only operate over the acquired radial lines by the addition of a third rail or some other device calculated to overcome the difference of gauge.

The Toronto Rapid Transit Association, the formation of which was announced in our last issue, having for its alleged main object, the completion of a complete provincial system of rural and interurban railways, etc., has closed its office in Toronto, and, apparently, ceased to exist.

An Alleged Fake Accident Case in London.

In Canadian Railway and Marine World for January, reference was made to an action by Charles Nickles against the London St. Ry. and the G.T.R., for damages for injuries alleged to have been sustained in a collision between a street car and a freight train at the interswitching crossing on Dundas St. East, London, July 24, 1913. For the defence, it was claimed that Nickles was not in the collision at all, but had been driving in the country with another person, and on returning, was held up by the freight train, at the crossing, and when the collision occurred he jumped from the buggy and disappeared in the dark, and was later found on the other side of the crossing and near the damaged street car.

The case came on at the Assizes in London, Ont., Jan. 16. After hearing a number of witnesses for the defence, including Nickles' companion in the buggy, all of which was corroborative, and altogether opposed to the story as told by the plaintiff, who called no witnesses, the Chief Justice dismissed the case with costs, remarking that while there were several features of the case which were hard to explain, the uncorroborated evidence of the plaintiff could not be accepted against the preponderance of evidence adduced by the defence.

Personal Paragraphs.

H. WARNER, Chief Engineer, Edmonton Interurban Ry., Edmonton, Alta., has resigned.

J. H. McGHIE, K.C., of Toronto, has been appointed Solicitor to the Ontario Railway and Municipal Board. This is a new position, and has been rendered necessary by the increase of legal work in the preparation of cases and papers.

J. F. H. WYSE, who for some time acted as engineer for the Ontario Railways and Municipal Board in matters affecting electric railways, has been appointed organizer and engineer of the Ontario Safety League, with office in Toronto.

A press report from Brantford, Ont., Jan. 18, stated that F. NICHOLLS, President, Canadian General Electric Co., Toronto, will be appointed receiver of the Grand Valley Ry., for three years, after which the city will be given the option of taking over the road. No confirmation of this can be obtained, but in any case, it is probably intended to refer to the Brantford St. Ry. only, which is a part of the G.V.R., and not to the entire system.

H. DOUGHTY, Superintendent, Regina Municipal Ry., gave an address before the Engineering Society, Regina, Sask., recently, on the welfare of employes. In this connection he mentioned the recreation room provided by the city for the railway employes, and recommended the adoption of the merit system, and the rule that no man should be discharged without a thorough investigation of the charges against him. As an instance of employes' efficiency he mentioned that although car mileage of 691,281 had been made, the city had only paid $84 in damages.

A. B. CORYELL, whose appointment as Superintendent Electricity and Tramways, Moncton Tramways, Electricity and Gas Co., Moncton, N.B., was announced in our last issue, was born at Lansing, Mich., Feb. 13, 1865, and entered transportation service in 1901, prior to which he had several important positions with light and power companies in the U.S. From 1901 to 1902 he was General Superintendent and Purchasing Agent, Meridian Ry. Light and Power Co., Meridian, Mo.; 1902 to 1903, Superintendent, Master Mechanic and Purchasing Agent, Belt Ry., Shrevesport, La.; 1903 to 1904, Assistant Superintendent and Electrical Engineer, Albany Electric Light and Water Plant, Albany, Ga.; 1904 to 1909, General Manager, Purchasing Agent and Chief Engineer, Huntsville Ry. Light and Power Co., Huntsville, Ala.; 1909 to 1911, General Manager, Chief Engineer and Purchasing Agent, Dayton Construction Co., Greenville, Tex.; 1911 to 1913, General Superintendent, Chief Engineer and Purchasing Agent, Southeastern Construction Co., Waycross, Ga. During the time he spent in Greenville and Waycross he built street railways there, putting both in operation, and managing them for some months. He also built portions of the street railway systems in Huntsville and Meridian.

Electric Railway Track Laid in Canada in 1913.

Canadian Railway and Marine World for January contained particulars of new track laid on electric railways in Canada in 1913 amounting to 164.115 miles, compiled from information supplied by railway companies, in response to the annual circular sent from this office, a few of the figures being estimated where returns had not been sent in. Since then replies have been received from several of the lines which had not previously reported, so that revised figures are given below, showing that 204.19 miles of new line were laid, against 106.56 miles in 1912.

	Miles.	Miles.
Berlin and Waterloo St. Ry.—		
Extensions		1.50
Brandon Municipal Ry.—		
Various extensions		2.00
British Columbia Electric Ry.—		
Vancouver and suburbs	9.66	
Victoria city and Saanich Peninsula interurban line	26.41	
		36 07
Calgary Municipal Ry.—		
Various extensions		10.50
Edmonton Interurban Ry.—		
Edmonton to St. Albert		5.00
Edmonton Radial Ry.—		
Various lines		21.115
Halifax Electric Tramways Co.—		
Various extensions		2.11
Hull Electric Ry.—		
Rivermead to Connaught Park		0.75
International Transit Co.—		
Extension		0.50
Montreal and Southern Counties Ry.—		
St. Lambert to M. & S.C. Jct.	4.00	
M. & S.C Jct. to Marieville	18 00	
		22 00
Montreal Tramways Co.—		
Various extensions		3.84
Niagara, St. Catharines and Toronto Ry.—		
St. Catharines to Niagara on the Lake		12 20
Moose Jaw Electric Ry.—		
Saskatchewan St. to Parkdale Boulevard	1.50	
Codeau and 6th Ave. to Kingsway Park	0.50	
		2.00
Niagara Welland and Lake Erie Ry.—		
In Welland, Ont.		0.85
Ottawa Electric Ry.—		
Extensions		5.50
Port Arthur and Fort William Elec. Ry.—		
Extensions, several		5.00
Quebec Ry., Light and Power Co.—		
St. Malo Ward	0.25	
Limoilou Ward	1.59	
		1.84
Regina Municipal Ry.—		
Extensions of City System		14.50
St. John Ry.—		
Extensions in St. John, N.B.		1.50
Saskatoon Municipal Ry.—		
Saskatoon to Sutherland		3.50
Toronto Civic Car Lines—		
Danforth Ave. Line	4.09	
Coxwell Ave.	0.57	
		4.66
Toronto Eastern Ry.—		
Whitby to Oshawa	4.00	
Oshawa to Bowmanville	8.80	
		12.80
Toronto Ry.—		
Extensions of various lines		2.21
Toronto Suburban Ry.—		
Weston to Woodbridge		9.00
Winnipeg Electric Ry.—		
St. Boniface to St. Vital	2.00	
Through Fort Garry	5.37	
Various city extensions	6.61	
		13.98
Winnipeg, Selkirk and Lake Winnipeg Ry.—		
Middlechurch to Stony Mountain		9.77
Total		202.19

The London St. Ry. laid 0.70 miles of second track; the Saskatoon Municipal Ry. laid about five miles of second track on existing lines, and the Galt, Preston and Hespeler Ry. laid some sidings. The Toronto Suburban Ry. has about 25 miles of its extension from Lambton to Guelph graded and ready for tracklaying, and the Toronto Eastern Ry. has another six miles about ready for tracklaying.

The Electric Railway Journal, New York, in its issue of Jan. 3, only credits Canada with 147.86 miles of new track laid in 1913, which is manifestly considerably under the mark.

Projected Hydro Electric Railway Lines in Ontario.

Specifications are being drawn up by the Ontario Hydro Electric Power Commission's engineer for the electrification of the London and Port Stanley Ry., under instructions from the London and Port Stanley Ry. Commission. The specifications are being based on the report on the cost, etc., of electrifying this city owned line, made by the Ontario Hydro Electric Power Commission's engineer, working in conjunction with S. B. Storer, consulting engineer, Syracuse, N.Y., and which was given in detail in Canadian Railway and Marine World for December, 1912.

At the request of the people of Huron County, the engineers of the Ontario Hydro Electric Power Commission have completed surveys on 166 miles of line in that county. These surveys have been made with the idea of connecting with London, St. Mary's, Stratford and Sarnia. Most of the towns in the county are included in the survey, which covers the following places: Goderich, Bayfield, Dashwood, Grand Bend, Crediton, Exeter, Hensall, Seaforth, Brussels, Wroxeter, Wingham, Dungannon, Benmiller, Clinton and Walton. The surveys are now awaiting the action of the Commission.

Applications have been received from practically all the municipalitles in Lambton County, and from the municipalities in the district between Guelph and Georgian Bay. In the former instance, the Commission is requested to report on a system of railways, connecting Chatham with the country to the north. In the latter case, similar information is desired for a line connecting Guelph with some point on Georgian Bay between Owen Sound and Collingwood. Surveys on these lines will be commenced immediately.

A press report from London says that a survey is being made of a line between that city and St. Mary's and Stratford. It also says that seven projected routes have been surveyed for the main line from London to Windsor, and are awaiting final selection. The report also states that practically all the property owners along the line have agreed to give the land necessary for the right of way. This scheme is said to be to join the London and Port Stanley Ry. line 9 miles south of London, and from that point, by way of Glencoe and Chatham, the distance to Windsor is 104 miles.

At a meeting of the Berlin City Council, Jan. 19, it was decided to invite neighboring municipalities to join in a request to the Commission to have a report prepared on the cost of an electric railway from Berlin to Woodstock, via New Dundee, Plattsville and Tavistock. It is also proposed to discuss the question of having township electric lines built in Waterloo County.

We are officially advised that the press reports that a draft of the agreement under which the Ontario Hydro Electric Power Commission proposes to build and operate the projected electric railway between Toronto, Port Perry and Uxbridge, has been submitted to the municipalities interested, is incorrect, and that the draft had not been completed for submission to the committee, although there has been some correspondence between the Commission's engineering department and the municipalities respecting the headings, manner of financing, and for their suggestions.

The reports stated that the Commission was prepared to raise the money necessary for construction by an issue of bonds to be secured by debentures issued by the municipalities, thus enabling the securing of money under the best possible conditions; that the Commission would retain full control over the lines built, regulating and fixing fares and rates for all classes of service; that the maximum fare was not to exceed 2c. a mile, with a minimum cash fare of 5c.; that arrangements might be made by the Commission for the interchange of traffic with other lines as might be desirable; that any applications for extensions of the line were to be considered by representatives of all the municipalities interested; that after all charges of operation had been met, and provision made for the fixed charges, the surplus if any would be divided among the municipalities according to the capital invested, the services rendered, the benefits derived and all other conditions.

It was further stated that the municipalities interested were being asked to send representatives to a meeting to be held at an early date to discuss the agreement, the plans for the line, and to deal with the whole question fully.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and allied companies.—Gross earnings for Nov., $746,152; operating expenses, maintenance, etc., $544,508; net income, $201,644, against $741,876 gross earnings; $512,077 operating expenses, maintenance, etc.; $229,799 net income for Nov., 1912. Aggregate gross earnings for five months ended Nov. 30, $3,760,507; net income, $976,721, against $3,477,083 aggregate gross earnings; $1,017,013 net income for same period, 1912.

Brantford St. Ry.—W. P. Kellett, General Manager and Chief Engineer, Lake Erie and Northern Ry., is said to have made an offer for the purchase of the Brantford St. Ry. It was reported in Brantford, Jan. 3, that the C.P.R. had secured control of the L.E. and N. Ry., and that the proposal to acquire the B. Ry. was a part of that company's plans.

W. P. Kellett had a conference with the Receiver of the company, and F. Nicholls, of the Canadian General Electric Co., in Toronto, Jan. 16, when he made a proposal regarding the future of the line. The Receiver intimated that the proposal would be submitted to the bondholders on Jan. 21. It is stated that all the money necessary to carry out the proposal has been arranged for, that if the deal goes through, a first class line, involving the reconstruction of the road and the supply of new rolling stock, will result, and that franchises for additional streets will be asked for, and a belt line will be run through Eagle Place and Parkdale.

Berlin and Waterloo St. Ry.—Press reports say that the statement for 1913 shows a gross profit of approximately $10,000. After deducting the usual amount for depreciation, the net profits will be about $4,000, of which Berlin will receive three quarters and Waterloo the remainder.

Calgary Municipal Ry.—The revenue for 1913 is reported as $757,042.26. It is stated that the net receipts will, when audited, show some decrease owing to a new system of accounting, involving a considerable percentage of the revenue being set aside for street repair, maintenance and depreciation.

Cape Breton Electric Co.—Gross earnings for November, $34,848.93; operating expenses and taxes, $18,080.19; net earnings, $16,768.74; interest charges, $4,808.33; balance, $11,960.41; bond sinking and improvement funds, $1,190; balance for reserves, depreciation, etc., $10,770.41, against $34,562.72 gross earnings; $15,809.75 operating expenses and taxes; $18,752.96 net earnings; $4,475 interest charges; $14,277.96 balance; $1,206.67 bond sinking and improvement funds; $13,071.29 balance for reserves, depreciation, etc.

International Ry.—The Public Service Commission for the second district of New York has authorized the company to execute a supplemental mortgage amending one approved in 1912, so as to require it to expend for maintenance, or to reserve in a fund for such purpose, not less than 16½% of its gross operating revenue, and providing that no bonds shall be issued in future, except when the earnings available for bond interest are 1½ times the amount of interest on the bonds then outstanding and of those it is proposed to issue.

Niagara Falls Park and River Ry.—See International Ry.

Montreal Tramways Co.—The third call of 10% upon the new capital issued April 15, 1913, is payable by subscribers, Feb. 2.

Nelson St. Ry.—By a vote of 404 to 84 the ratepayers of Nelson, B.C., decided recently to purchase the franchise and property of the N.S. Ry.

Peterborough Radial Ry.—The Ontario Legislature is being asked to increase the company's bonding powers from $20,000 to $35,000 a mile of single track.

Quebec Ry., Light and Power Co.—The interest on the company's bonds, due Dec. 1, 1913, was not paid, and it is anticipated that, as was done in the case of the interest due last June, the amounts will be paid within the 90 days of grace allowed in the terms of the mortgage.

St. Thomas Street Ry.—Receipts for Dec., 1913, $1,783.74, against $1,304.06 for Dec., 1912. Passengers carried in Dec., 1913, 42,252, against 37,715 in Dec., 1912. The aggregate total receipts for the year showed an increase of $4,832.82 over 1912.

Toronto and York Radial Ry.—The ratepayers of Toronto, by a vote of 15,126 to 7,726, approved recently of a bylaw authorizing the Toronto City Council to issue debentures to pay for the Toronto and Mimico Ry. section of the Mimico Division of the T. and Y.R. Ry. This piece of line extends from Sunnyside to the Humber River, and is being taken over by the city upon the expiration of the franchise. The purchase price was fixed by the Ontario Railway and Municipal Board, after the company and the municipality had come to terms upon most points involved.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for November, $849,279; operating expenses, maintenance, etc., $409,973; net earnings, $439,306, against $742,156 gross earnings; $358,371 operating expenses, maintenance, etc.; $383,785 net earnings for Nov., 1912. Aggregate gross earnings for 11 months ended Nov., 1913, $8,893,984; net earnings, $4,438,524, against $7,717,304 aggregate gross earnings; $3,951,504 net earnings for same period, 1912.

Winnipeg Electric Ry.—Gross earnings for November, $360,082; operating expenses, $198,874; net earnings, $161,208, against $345,091 gross earnings, $181,051 operating expenses; $164,040 net earnings for Nov., 1912. Aggregate gross earnings for 11 months ended Nov. 30, 1913, $3,698,831; net earnings $1,658,193, against $3,403,683 aggregate gross earnings; $1,595,755 net earnings for same period, 1912.

The figures given above represent the total earnings of the company, including receipts from lighting, etc. The actual street railway earnings for 1913 were $2,384,597.28, an increase of $269,604.48 over 1912. The amount received by the city as its percentage was $125,788.96.

The British Columbia Electric Ry. will furnish a private ward in the Royal Columbian Hospital, New Westminster, to be called the B. C. Electric Ry. Ward.

Electric Railway Projects, Construction, Betterments, Etc.

Brandon Municipal Ry.—Two miles of additional track which was under construction at the end of 1912 were, we are advised, completed during 1913, the work being done by day labor, under the charge of J. Antonisen, Superintendent. The construction programme for this year has not been arranged. (Dec., 1913, pg. 592.)

British Columbia Electric Ry.—The total mileage of the company's lines on the mainland, in and around Vancouver, and on Vancouver Island, in and around Victoria, B.C., counted as single track, was at Dec. 31, 1913, we are officially advised, 370.09 miles. During 1913, there were 36.07 miles of line added, viz.—On the Vancouver city and suburban lines on the mainland, 9.66 miles, and on the Victoria city line and the Saanich Peninsula interurban line, 26.41 miles.

The Hastings St. car extension to North Burnaby, B. C., was opened for traffic Dec. 24. F. R. Glover, General Executive Assistant, stated in a speech at the opening ceremony, that this is the first of a series of lines which the company propose to build through the territory. This extension is two miles long. Another two mile extension out of Kerrisdale is completed, and is expected to be put in operation in February. Plans have been approved for the building of additional lines in South Vancouver, and from Kerrisdale to Point Grey, and it is expected that construction will be started in the spring. (Jan., pg. 38.)

Dunnville, Wellandport and Beamsville Electric Ry.—Press reports that the charter of this company was about to be purchased by the Toronto, Hamilton and Buffalo Ry., are denied by officials of that railway. The D. W. & B. E. R. Co. has power to build a line from Dunnville to Jordan and St. Catharines and other points in the Niagara peninsula.

Application is being made to the Ontario Legislature to extend the time for building the lines. (Dec., 1913, pg. 592.)

Edmonton Radial Ry.—The total length of the system of lines owned and operated by the city of Edmonton, Alta., under this title is 52.644 miles, counted as single track, of which 0.777 of a mile are spurs, terminals, wyes and loops; the remaining 51.867 miles is classified as follows:—Permanent double track, 30.891 miles; permanent single track, 1.186 miles; temporary double track, 8.837 miles; temporary single track, 10.343 miles; spurs, 0.610 mile. During 1913, the following mileage of new track were laid:—Permanent double track 21.024 miles; permanent single track, 0.630 mile; spurs, 0.123 mile; sidings, terminals, wyes and loops, 0.777 mile; total, 21.892 miles. Deducting the sidings, etc., this leaves 21.115 miles of new operating track, calculated as single track, added to the system during the year. The construction programme for this year has not yet been determined. (May., 1913, pg. 235.)

Estevan Transit and Power Co.—The Saskatchewan Legislature has incorporated a company with this title to build the lines mentioned in issue of Dec. 1913, pg. 593. (Jan., pg. 38.)

Forest Hill Electric Ry.—Application is being made to the Ontario Legislature to increase the bonding powers of the company to $50,000 a mile, and for an extension of the time within which the company is required to expend $50,000 on construction, from Apr. 6 to Dec. 15, 1914.

Fort William Electric Ry.—The city of Fort William, Ont., is applying to the Ontario Legislature to sanction a by-law to expend $30,000 to build and equip an extension of the street railway to the corporation stone quarry near Mount McKay; and also a by-law to expend $238,000 for further improving and extending the street railway system. The present street railway debenture debt is officially stated to be $854,000. (See Port Arthur and Fort William Electric Ry., Jan., pg. 39.)

Galt, Preston and Hespeler St. Ry.—The Town Council of Preston, Ont., has granted the company a franchise for 25 years, dating from Feb., 1913, when the previous 20 year franchise expired. The franchise gives the company permission to build a second track on its lines. (July, 1913, pg. 367.)

The Galt, Preston and Hespeler St. Ry. did no construction work during 1913, with the exception of putting in some service sidings.

Guelph Radial Ry.—The company is applying to the Ontario Legislature for an extension of time within which it may complete a number of authorized branch lines, and for power to build branches not exceeding half a mile each, in Guelph, Ont.

London and Lake Erie Ry. and Transportation Co.—Representatives of the municipalities interested in the proposed electric railway from St. Thomas via Aylmer to Port Burwell, Ont., met in St. Thomas recently, and discussed the matter. They decided to ask the L. and L.E. Ry. and T. Co. to put its proposition in writing, and to ask the Ontario Hydro-Electric Commission for information as to the conditions under which that body is prepared to co-operate with municipalities for the building of lines. (Jan., pg. 38.)

London St. Ry.—A start was made Dec. 25, in operating the L. S. Ry. with power supplied by the local Hydro-Electric Commission, and on Jan. 1, the line south of the

Medicine Hat Tramways, Ltd.—We are officially advised that pending the result of the litigation instituted by E. G. Fagan, to have the bylaw granting an extension of time for construction quashed, the company is not in a position to continue its arrangements for proceeding with the work in the spring. R. O. Sweezy, General Manager of the Montreal Engineering Co., which has the franchise, was in Medicine Hat, during the last week in January, negotiating for a settlement of the matter. (Jan., pg. 38.) Dundas St. line was being so operated. It is expected that early in February the entire line will be operated under the power agreement with the city. (Dec., 1913, pg. 593.)

Montreal and Southern Counties Ry.—Progress is being made with construction on the extension from Marieville to St. Cesaire, Que., 9 miles, the work being done by the company's own staff. The bridge across the Yamaska River at St. Cesaire, is being built by Ross and McComb. It is expected this section will be completed during the summer, after which the line will be continued from St. Cesaire to Granby, 15 miles. Surveys have been completed into Granby.

The Montreal City Council, Jan. 12, after considering the report of the Board of Control, which passed on the report of the Municipal Tramways and Railway Engineer, recommending that the company's application to lay tracks on Youville and St. Peter streets be not entertained, decided to give the company permission to extend its line to Youville Square. The company desires to lay tracks on these streets in connection with its terminal improvements. (Jan., pg. 38.)

Montreal Tramways Co.—We were advised, Jan. 9, by the chairman of the Quebec

Legislature's Committee on Private bills, that no application has been made for the consideration of any act in the interests of the M. T. Co., and that the press statements referred to in our last issue, in connection with his alleged statement of a projected extension of the franchise are "utterly baseless."

The company's construction department is building an extension known as the Longue Pointe line, from Montreal to Pointe Aux Trembles, 6.78 miles of single track.

The company has acquired a block of land containing 411,200 square feet on the Lachine canal, on which it is proposed to erect car barns and yards for the Lachine cars. It is expected that the work of laying out this area will be started in the spring.

G. B. McLeod, who is the engineer in charge of tramway and railway affairs under the City Engineer of Montreal, is understood to have practically completed his report on the proposals of the M. T. Co., and of the Canadian Autobus Co., as to the construction of subways and underground lines in the city. It is not expected, however, that the report will be made public before Feb. 1.

The M. T. Co. has informed the Outremont Town Council that it proposes, early in the spring, to start construction on the extension of the Van Horne Ave. line to the town limits. (Jan., pg. 38.)

Morrisburg and Ottawa Ry.—At a meeting of the Morrisburg Council, Jan. 21, an application by the M. & O. Ry. was heard, for a right of way through the town. The council has already granted a right of way to the Ottawa and St. Lawrence Electric Ry., which right will expire on Oct. 1, if not taken advantage of, and it was announced that nothing could he done in the way of granting any fresh rights until after that date.

Morrisburg and Ottawa Ry.—Calls of 10% on the subscribed capital of the company are due and payable at the office of the company, Canada Life Building, Ottawa, Feb. 2, April 6, June 8, and Aug. 22. R. A. Bishop is Secretary. (Nov., 1913, pg. 544.)

Niagara, Welland and Lake Erie Ry.—Track was laid on 0.85 of a mile of line on North and West Main streets, Welland, Ont., during 1913. The company has under consideration the building of a line from Welland to Port Colborne and Fort Erie, 30 miles, and from Welland to Niagara Falls, 13 miles. T. R. Cummins, Welland, Ont., is Engineer. (Oct., 1913, pg. 494.)

Nipissing Central Ry.—The new car barns at North Cobalt, Ont., have been completed and opened. The general and operating offices are located in the northwest end, while adjoining is a general waiting room. The barn will accommodate 10 cars, and is fitted with three pits, two of which are in the workshop section. A room for motormen and conductors is arranged in the rear, and at the west end is the boiler and generator room. The building is of brick, on reinforced concrete foundation, with a steel framed roof. (Sept., 1913, pg. 442.)

North Midland Ry.—Application is being made to the Ontario Legislature for an extension of time for the commencement and completion of this line.

The Ottawa, Rideau Lakes and Kingston Ry. is applying to the Ontario Legislature to increase its bonding powers to $40,000 a mile, and to extend the time for the completion of the road.

The Peterborough Radial Ry. is applying to the Ontario Legislature to increase its power to issue bonds, debentures or other securities, from $20,000 to $35,000 a mile of single track.

The Quebec Ry., Light and Power Co. added 1.87 miles to its tracks during 1913. It has no new work on hand or projected. (Sept., 1913, pg. 442.)

Regina and Moose Jaw Interurban Ry.—We are officially advised that surveys have been completed and a satisfactory route secured for the proposed interurban railway from Regina to Moose Jaw, Sask., 40 miles, and that it is expected construction will be started early in the spring. Nothing has been decided as to whether the line will be operated by gas or electric cars, in fact, we are advised Diesel oil engines may be adopted. J. Friedman, Seattle, Wash., is the principal promoter of the company, the organization of which is not fully completed.

St. John Ry.—We are officially advised that the company has under consideration the following extensions:—From Fairville to Manawaganish Road, one mile, and from Kane's Corner to Crouchville, two miles. (Jan., pg. 39.)

St. Thomas St. Ry.—We are officially advised with respect to the projected extension of the line to Pinafore Park, St. Thomas, Ont., that nothing will be done for some time. (Dec., 1913, pg. 593.)

Saskatoon Municipal Ry.—The new electric railway built under an agreement with the Sutherland, Sask., Town Council, by Saskatoon and Sutherland Contracting Co., between Saskatoon and Sutherland, has been put in operation. The line, which is 4.5 miles long, will be operated as part of the Saskatoon Municipal Ry., under a 20 year contract. An hourly service is being given, with a 5c. fare, from Sutherland to the top of the Long Hill, where connection is made with the Saskatoon city system. (Jan., pg. 39.)

Toronto, Barrie and Orillia Ry.—The ratepayers of Barrie, Ont., have approved of a bylaw granting a franchise to this company for an electric railway in the town, and the property owners, voted in favor of granting the company a fixed assessment of $15,000 during the continuance of the franchise.

The agreement provides for the building of a line with the necessary turnouts and switches on Elizabeth St., and such other streets as may be agreed upon, so as to give a continuous line through the town from the eastern limits south of the bay to the eastern limits of the town north of the bay. In the event of a line being built on Bradford St. the company is to assume the responsibility borne by Curran and Clement under the terms of about Oct. 17, 1913. The company also agrees to build during the currency of the franchise an electric railway from either Utopia or Midhurst stations on the C.P.R. Toronto-Sudhury line, to Barrie, entry into that town being made along Elizabeth St. This line is to be put under construction by April, and the lines in Barrie are to be ready for operation by Sept. 1. A freight and express station is to be provided, where all freight and express matter is to be received and delivered. No freight cars are to be run along its tracks in the town between 8 a.m. and 11 p.m., but express cars can be run at all hours. Five cent fares are to be charged for distances up to three miles, and beyond that distance the fare is not to exceed 2c. a mile; children's fares are to be 3c. for three miles, and 1c. a mile for distances over that. School children under 17 years will be sold tickets at eight for 25c. An hourly service is to be maintained between 8.30 a.m. and 11 p.m. between Blake St. and Milburn St., and a reasonable service from these points to the town limits. The franchise is to run for 25 years, and the Town Council has the right, on giving a year's notice prior to its expiry, to assume possession of the line within the town on the payment of the actual value as determined by the Ontario Railway and Municipal Board. If this right is not exercised the franchise is to be continued, the corporation having the right to take over the line under the same conditions at the expiration of any period of five years. The corporation reserves the right to grant a franchise to any other company for an electric railway in the town, and to use the company's tracks upon such terms as may be agreed upon. The company's property in the town is to have the value for assessment purposes of $15,000 for eight years from Jan. 1, 1916. W. H. Jackson, Toronto, is interested, and we are informed that the final organization of the company is being completed, and that a statement of the company's plans will be made at an early date. (Jan., pg. 22, and also Monarch Ry., Feb., 1912, pg. 91.)

The Toronto, Barrie and Orillia Ry. is asking the Ontario Legislature to increase its bonding powers, to extend the time within which it is required to expend 15% of its capital on construction, and to authorize the operation of cars on Sundays.

Toronto Civic Car Lines.—The Mayor of Toronto, in his recent inaugural message to the City Council, said:—"During the past year we have put into operation the civic car lines on St. Clair Ave. and Danforth Ave. These lines are second to none in construction and equipment, and along with Gerrard St. line give us 16.96 miles of single track equipment with 24 double-end prepayment cars. While these lines will necessarily be operated at a heavy loss, the accommodation provided for the people living in these outlying districts is greatly appreciated. No doubt these lines will be extended in the near future to connect with the existing city system at points like Lansdowne Ave. and Royce Ave., and at Dovercourt Road and Van Horne St.

Toronto Eastern Ry.—We are officially advised that track was laid on 12.8 miles of line during 1913 as follows:—Whitby to Oshawa, 4.0 miles; Oshawa to Bowmanville, 8.8 miles; and that construction is advanced on the line between Whitby and Pickering, 6.4 miles. The contractor is Ewen Mackenzie, Toronto. Surveys have been completed for the extension of the line from Pickering to a point in Scarboro tp., 15 miles. It is understood that this line will connect with the Canadian Northern Ontario Ry., and enter Toronto over that line. E. W. Oliver, Toronto, is Chief Engineer. (Jan., pg. 38.)

Toronto Ry.—During 1913 there were completed 2.213 miles of new lines on the company's system in Toronto. (Jan., pg. 39.)

The Toronto Suburban Ry. has let a contract to Canadian General Electric Co. for the substation apparatus for the line from Lambton to Guelph, Ont., 46 miles, and which will probably he extended to Berlin, 13 miles farther on. It is said that this will he the first interurban line in Canada to operate at 1,500 volts direct current. The catenary type of overhead construction will be used, and there will be three substations at Islington, Georgetown and Guelph, respectively. Fifteen hundred volt rotary converters of 500 k.w. capacity each will be used, power being transmitted to the substations at 25,000 volts. Provision will also be made for the supply of power from a separate bank of transformers in each substation for distribution along the line for miscellaneous power and lighting purposes.

Winnipeg Electric Ry.—During 1913 there were laid 6.61 miles of new track on streets in Winnipeg; two miles of an extension from St. Boniface through part of

St. Vital; and 5.37 miles on a line through part of Fort Garry.

The Stonewall line, which is being built under the Winnipeg, Selkirk and Lake Winnipeg Ry. charter, branches off from the main line at Middlechurch. Track was laid to Stony Mountain, 9.77 miles during 1913, and it is expected to complete construction during this current year from Stony Mountain to Stonewall, Man., 7.5 miles. Wilford Phillips, Winnipeg, is General Manager. (Jan., pg. 39.)

Electric Railway Notes.

The Hull Electric Co. has ordered four pairs of trailer trucks in the United States.

The Toronto Ry. Co. is assessed for $3,625,626 by the City of Toronto.

The Port Arthur Electric Ry. has ordered two single truck cars from Preston Car and Coach Co.

The Halifax Electric Tramway Co. recently received six 21 ft. closed cars from the Nova Scotia Car Works.

The Saskatoon, Sask., City Council has adopted a new schedule for the operation of cars on the municipal railway. Seven routes are to be operated, by six large and 10 small cars, two extra cars being put on during the rush hours. The Mayor stated that the traffic does not at present warrant the operation of more cars.

The Fort William Electric Ry. has been placed under the direct supervision of a street railway committee of which the following are members for this year: R. J. Mamon, Chairman; H. Murphy, M. B. Dean, A. H. Dennis, and the Mayor (S. C. Young). M. O. Robinson is Manager as well as of the Port Arthur Electric Ry.

A report was submitted to the Winnipeg City Council, Jan. 6, by the City Engineer, as to the cost of a municipal omnibus system in the city. The capital expenditure necessary for land and buildings is put at $70,000, and for 40 busses at $240,000, a total of $310,000. The annual cost of the system is estimated at $178,562. The probable revenue is put at $175,000.

The Saskatoon Municipal Ry. rolling stock consists of 12 single truck, two motor cars, each with seating capacity of 32; they are 34 ft. 4 ins. long, 8 ft. 4 ins. wide, 11 ft. 5 ins. high, and with a wheel base of 8 ft., built in the United States; also 6 double truck, four motor cars, 45 ft. long over all, with a seating capacity of 44, built by Preston Car and Coach Co.

The British Columbia Electric Ry. Co. ordered the following rolling stock during 1913:—3 passenger motors, closed, 43 1-3 ft., interurban service, trucks standard C60, built at the company's shops; 30 freight cars, box, 60,000 lbs., 40 ft., interurban trucks, built at Seattle, Wash.; 30 freight cars, flat, 60,000 lbs., 41 ft., interurban service, built at Seattle; 3 sweepers, 28¼ ft., city service, built by Ottawa Car Co.; 15 logging cars, 80,000 lbs., 42 ft., interurban service, built at Seattle; 2 combination passenger and mail motors, 38 ft., interurban service, trucks standard C60, rebuilt at company's shops from old cars.

The Toronto Suburban Ry. is preparing specifications for cars for its line which is being built from Lambton to Guelph, Ont., and it is probable that an order for about ten 65 ft. cars will be placed in the near future. The electrical equipment will be supplied by Canadian General Electric Co. The cars will be equipped with four 85 h.p. motors of the latest type, fully ventilated, and the control will be of the multiple unit type to permit of train operation. The cars will operate on 600 volt line at approximately half normal speed, and changing from 1,500 volt to 600 volt trolley or vice-versa will involve no loss of time in adjustment of control apparatus.

The Port Arthur St. Ry. has ordered from the Ottawa Car Manufacturing Co., one single truck, p.-a.-y.-e. car, double end, double end control, for delivery in six weeks; and three double end, single truck, double end control, p.-a.-y.-e. cars, from Preston Car and Coach Co., for delivery in 75 days.

The London St. Ry. intended putting into operation a Sunday service over its lines, commencing Jan. 25, subject to the necessary amendments to its agreement with the city being satisfactory. The service as outlined by the city was a half-hourly one from 8 to 10 a.m., every 15 minutes from 10 a.m. to 10 p.m., and half-hourly from 10 to 10.30 p.m. Additional service may be given if deemed desirable. The fares will be the same as on week days, except that workmen's tickets will not be available.

The Niagara, St. Catharines and Toronto Ry. has ordered six interurban cars from the Preston Car and Coach Co. The body of these cars will be 56 ft. long, with steel underframing, steam car type of hood and full empire interior finish. Three of the cars will be equipped as combination baggage and smokers, and in the other three the baggage compartment will be eliminated. They will have multiple unit control for train operation, the intention being to operate the main line cars in one or more units, according to traffic requirements. Taylor trucks, electric markers, classification lamps, air sanders, etc., will be supplied, but, at the time of writing, the type of motor has not been decided on. The weight of the cars will be about 65,000 lbs. each, with a seating capacity of 66 passengers.

London and Port Stanley Railway Electrification.

The City of London, Ont., is applying to the Dominion Parliament for an act to confirm and declare to be valid and binding the lease of the L. and P. S. Ry. to the city; to ratify and confirm the appointment of the London and Port Stanley Railway Commission by the city council, and to authorize the commission to have the entire management and control of the railway for and as agents of the city, and to grant such powers as are necessary or expedient to enable the commission to have the whole management and control of the construction, equipment, maintenance and operation of the L. and P. S. Ry.

The city council has issued a notice to the effect that any motion to quash the by-law approved by the ratepayers and finally passed by the city council, Nov. 11, to provide $700,000 for the electrification of the line, must be filed within three months from Dec. 20, 1913.

The Mayor of London is an ex-officio member of the commission, the appointed members of which are:—Hon. Adam Beck, M.L.A., Chairman, appointed for two years; P. Pocock, Vice Chairman, appointed for two years; W. Spittal, and M. D. Frazer, commissioners, appointed for one year. (Jan., pg. 37.)

In the electrification which the Chicago, Milwaukee and St. Paul Ry. is projecting on its mountain division, the installation will resemble in a general way that on the C.P.R. Rossland Branch, not only in point of electrical equipment, but also from the power sources. The 2,400 volt direct current system will be employed, and power will be obtained from a local power company, as in the C.P.R. installation.

The Windsor & Tecumseh Electric Railway Extension Application.

Canadian Railway and Marine World for January contained full particulars of the proceedings before the Ontario Railway and Municipal Board in reference to the application by the Sandwich East Township for an order to compel the company to build a belt line between Tecumseh and Walkerville. The Board has since decided that the present line in the township is not being operated at a profit, and that the company is not therefore as yet liable to build a belt line. The costs have been divided equally between the township and the company.

Crossings of Montreal Tramways Co.'s Tracks in Pointe aux Trembles.

The Quebec Board of Public Utility Commissioners on Dec. 27, 1912, authorized the Town of Pointe aux Trembles to open four streets across the Montreal Tramways Co.'s tracks, reserving provisions for their protection and maintenance for a further order. The matter again came before the Board recently, when it was shown that two of the streets had been opened, but had not been provided with fences, cattle guards and signs. The Board therefore ordered that the town forthwith construct such fences, wing fences and cattle guards as are ordinarily required at such crossings, and to erect the usual signs, the whole work to be done subject to the M.T. Co.'s approval, and in event of any difficulty between the parties the same to be determined by the Board's engineer. The work up to within 18 ins. of the M.T. Co.'s outer rails to be done by the town, and the other work between the spaces mentioned to be done by the town at the M.T. Co.'s expense. The work done by the town to be maintained by it, and the work done by the company to be maintained by the latter.

The Power Question in Manitoba.—The Manitoba Public Utilities Commissioner is preparing a report for submission to the Government, upon the subject of hydro-electric power. A report on this question has already been prepared by the water power branch of the Department of the Interior. The principal part of this report deals with the possibilities of development of power on the Winnipeg River, which is described as one of the most notable rivers for power purposes on the continent, having a considerable fall, and a most uniform flowage throughout the year. The maximum flowage is about four times its minimum flowage, in contrast with the Ottawa River, where the maximum flowage is about 40 times the minimum. It is estimated that at eight not distant power sites 400,000 continuous horse power can be developed.

Montreal City and Autobus Co.—The Quebec Court of Appeal decided Jan. 10, that the contract entered into between the City Council and the company is a legal and binding one. The original applicant to have the agreement quashed was D. Robertson, of the Montreal Tramways Co.

A charge for street railway transfers at Cleveland, Ohio, is likely to be put into effect after Jan. 1, to recoup the Cleveland Railway for losses sustained by the recent heavy snowstorm. The charge will be 1 cent per transfer.

The Ontario Railway and Municipal Board passed an order recently requiring the Hamilton St. Ry., to complete by May 19, the installation of all its double truck cars with air brakes of a type to be approved by the Board's engineer.

Answers to Questions on Electric Railway Topics.

Following are answers to questions in the American Electric Railway Association's question box, sent in by officials of Canadian electric railways:—

Shop Men's Instructions. — Should not more detailed and specific instructions and data be furnished shop men, and if so, what should be its nature? Shop men are disposed, in most instances, to do exactly what is desired, but in very many cases, do they really know what is wanted, and how to do it efficiently?

W. R. McRae, Master Mechanic, Toronto Ry.—"Most decidedly shop men should be furnished with full data and instructions relative to the work in which they are engaged. The practice of this company is to engage only those men who have had, at least, a good common school education and who speak English. Blue prints, printed instructions, both electrical and mechanical, are supplied the men. In addition to this, blue prints and instructions are posted in convenient places both in the shops and the several divisions. We also have an apprenticeship course, which has been very beneficial in securing trained men for the service."

Foremen's Visits to Other Shops.—While officers and heads of departments get together and interchange ideas at conventions, meetings, etc, is there not too much stay at home for foremen and sub foremen of smaller shops and departments? Would it not be to the advantage of the railway companies, creating as well a better feeling among the men who are on the firing line, to have occasional visits to shops, and see men engaged on lines of neighboring companies?

W. R. McRae, Master Mechanic, Toronto Ry.—"For the past few years, and it still is, the policy of this company to send officials and employes to neighboring companies' shops, to see what is being done along similar lines to their own work, the company, of course, paying all expenses. The above outlined practices, in conjunction with skilled, painstaking foremen, are undoubtedly responsible for the high standard of the shop men employed by this company."

Collection of Transfers and Free Tickets. —What are the advantages of collecting transfers and free tickets at the end of each trip?

F. L. Hubbard, Assistant to Manager, Toronto Ry.—"Do not see much, if any. Certainly no advantage under our system of collecting fares with portable hand box. The conductor makes a record of the transfers collected on each half trip and encloses the transfers for each round trip in an envelope, which is then sealed. At the termination of his run, the conductor wraps envelopes in a folder and deposits same at division office. Free tickets are deposited in fare box by passengers in same manner as revenue fares."

Advertising Attractions.—Of the following, which plan or system of advising the public as to band concerts, special entertainments, such as carnivals, circuses, ball games, etc., has given the best results—printed signs or notices on dash of cars, signs on interior or exterior of car windows, interior advertising rack signs, hanging of folders in cars so that passengers can help themselves to copies?

F. L. Hubbard, Assistant to Manager, Toronto Ry.—"We use boards with printed paper signs pasted thereon, 29½ by 21½ ins. in size, displayed on the upright portion of fender in front of dash of car. By limiting, whenever possible, the printed matter to four lines in large type, a plain, bold sign is obtained, which experts consider is the best advertisement in the city for the purposes named. We use this method to advertise features at our summer park, and the privilege is much sought after for other large events in the city."

Road Construction. With crushed stone ballast and concrete paving foundation, are creosoted ties an ultimate economy? (a) When concrete paving foundation comes only to the top of the tie; (b) When concrete paving foundation comes 2 ins. above top of tie.

W. F. Graves, Chief Engineer, Montreal Tramways Co.—"Do not consider the use of creosoted ties an ultimate economy in any track construction with crushed stone ballast and concrete paving base."

What has been your experience regarding the wear of the grooved granite block paved up to the gauge side of the T rail track on a narrow street where the vehicular traffic is heavy? Do you find that a groove block laid in connection with a T rail on such a street keeps vehicular traffic out of the railway strip, as compared with the modern groove girder rail?

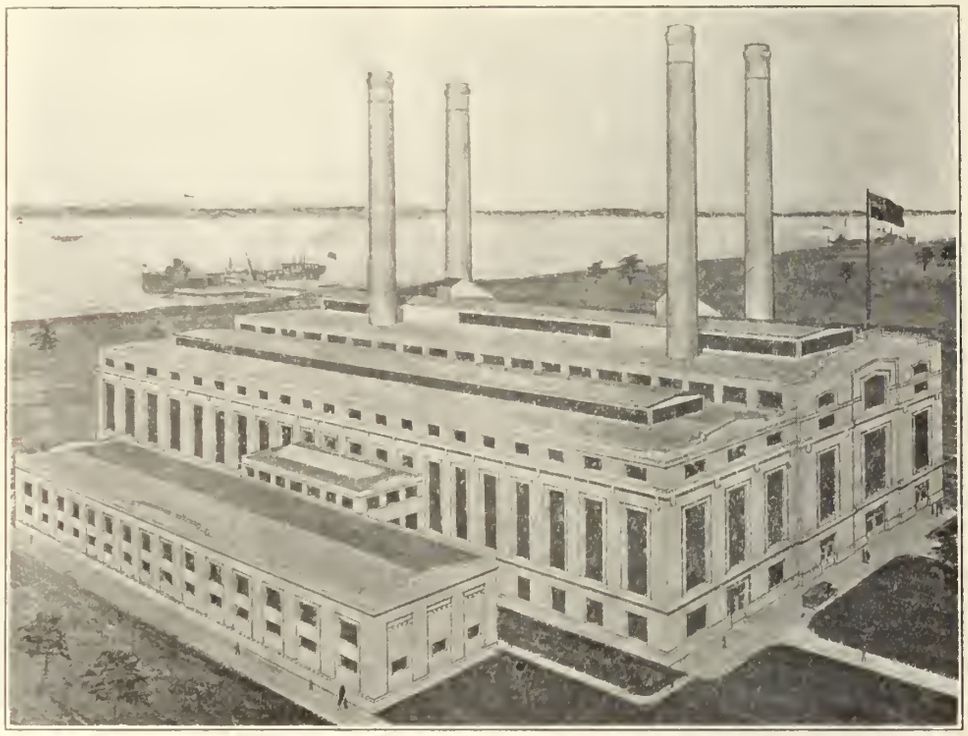
W. F. Graves, Chief Engineer, Montreal Tramways Co.—On a narrow street, where vehicular traffic is heavy, it should have the type of rail which offers the least resistance to getting in and out of the track, and that is the grooved girder rail. If necessary to use T rail, the granite nose block should be used in preference to any other block. The grooved block laid with T rail on such a street would probably tend to keep the vehicular traffic out of the railway strip, providing there is sufficient roadway on either side, but it is very much to the detriment of the car traffic.

Are there any systems using portable toilets, connecting to sewer manholes in streets where construction work is in progress? What is the best design of such portable toilets? What is the best method of keeping check on track laborers where it is necessary to leave the work to use toilets, when portable toilets are used?

W. F. Graves, Chief Engineer, Montreal Tramways Co.—Most urban systems use the portable toilet in connection with the sewer manholes on construction work. They should be about 4 by 4 by 6 ft. in height, and under all circumstances have a roof. The matter of keeping check on track laborers should be directly under the supervision of the gang foreman, as toilets should be located sufficiently close so that he would have supervision of his men at all times.

Dominion Power and Transmission Co.'s Steam Plant.

The steam power station which is to be erected in Hamilton, Ont., by the Dominion Power and Transmission Co., is designed for the accommodation of six 10,000 kilowatt generating units, turbines, operated by steam at 200 lbs. pressure, 200 degrees superheat. The auxiliaries will be mostly steam driven, except the exciter, which will be motor driven. There will also be one or two steam driven exciters. There will be used surface condensers, turbine driven, air and hotwell pump, circulating pump and boiler feed pump. The feed heater will be of the open type. The boiler plant will ultimately consist of 14 units of 1,050 h.p., each equipped with superheaters and underfeed stokers.



Dominion Power and Transmission Co.'s Power House.

The accompanying illustration shows the location of the boiler room, turbine room, offices and transformer house, as they will be when completed. Definite plans of the interior arrangements are not yet finally arranged.

The plans show two buildings. The larger one will be the boiler room, and the smaller one the transformer room. The foundation work for the first part of the structure is expected to be started early in March and will be done under the direction of the company's own staff. Tenders will be invited at a later date for the steel and other work of the structures. W. C. Hawkins, Hamilton, is Managing Director.

Marine Department

The Organization of Canada Steamship Lines, Limited.

During 1913 Canadian Railway and Marine World published full details of the various absorptions and amalgamations with which the Richelieu and Ontario Navigation Co. has been concerned, and also of the rounding off of the series by the formation of Canada Transportation Lines, Ltd., and the change of name to Canada Steamship Lines, Limited. Following is a complete list of the new company's officers: President, James Carruthers, heretofore President, Richelieu and Ontario Navigation Co., Montreal; Vice Presidents, W. Wainwright, Vice President, G.T.R. and G.T.P.R., Montreal; M. J. Haney, hertofore President, Canada Interlake Line, Toronto; J. P. Steedman, heretofore director, Richelieu and Ontario Navigation Co., Hamilton; Managing Director, J. W. Norcross, heretofore Managing Director, Canada Interlake Line, office, Montreal; General Counsel, C. A. Barnard, K.C., Montreal; Assistant to President and Secretary, F. Percy Smith, heretofore Secretary, R. & O.N. Co., office, Montreal; Comptroller, F. S. Isard, heretofore Secretary and Chief Accountant, Canada Interlake Line, Toronto, office, Montreal; Treasurer, J. I. Hobson, heretofore Comptroller and Treasurer, R. & O.N. Co., office, Montreal. The following appointments have also been made, effective from Jan. 1:—

W. E. BURKE, heretofore Traffic Manager, Canada Interlake Line, Ltd., Toronto, Assistant Manager. Office, Montreal.

H. FOSTER CHAFFEE, heretofore Passenger Traffic Manager, Richelieu and Ontario Navigation Co., Montreal, Passenger Traffic Manager. Office, Montreal.

L. A. W. DOHERTY, heretofore Freight Traffic Manager, Richelieu and Ontario Navigation Co., Toronto, Freight Traffic Manager. Office, Montreal.

GILBERT JOHNSTON, heretofore Mechanical Superintendent, Richelieu and Ontario Navigation Co., Montreal, Mechanical Superintendent Passenger Steamers. Office, Montreal.

THOMAS HENRY, heretofore Manager, Eastern Lines, Richelieu and Ontario Navigation Co., Montreal, Operating Superintendent Passenger Steamers. Office, Montreal.

PETER PATON, heretofore Manager, Northern Navigation Co., Sarnia, Ont., Assistant Operating Superintendent Passenger Steamers. Office, Toronto.

H. H. GILDERSLEEVE, heretofore Manager WesternLines, R. & O.N. Co., Toronto, Manager, Northern Navigation Co. Office, Sarnia, Ont.

H. W. COWAN, heretofore Operating Superintendent, Canada Interlake Line, Toronto, Operating Superintendent Freight Steamers. Office, Toronto.

J. J. PHELAN, heretofore Assistant to Mechanical Superintendent, Richelieu and Ontario Navigation Co., Purchasing Agent. Office, Montreal.

R. DUGUID, heretofore Chief Engineer, Canada Interlake Line, Superintendent Engineer. Office, Toronto.

W. H. FEATHERSTONHAUGH, heretofore Shore Superintendent, Inland Lines, Ltd., Superintendent of Hulls. Office, Toronto.

JOHN F. PIERCE, heretofore Assistant General Passenger Agent and General Baggage Agent, R. & O.N. Co., same position in the new company, in charge of party business and baggage, and with jurisdiction over territory and ticket offices east of Sharbot Lake in Ontario and Quebec. Office, Montreal.

W. F. CLONEY, heretofore District Passenger Agent, R. & O.N. Co., Buffalo, N.Y., General Agent, Passenger Department, in charge of Buffalo, Rochester and Niagara Falls ticket offices, his passenger jurisdiction to embody New York State west of Syracuse, Pennsylvania, Pittsburg and west, Ohio and Southern States. Office, Buffalo,

J. F. DOLAN, heretofore District Passenger Agent, R. & O.N. Co., Boston, Mass., General Agent, Passenger Department, with territory covering Maine, Massachusetts, Connecticut, Rhode Island, New Hampshire, Vermont and the Maritime Provinces. Office, Boston, Mass.

J. W. CANVIN, heretofore District Passenger Agent, R. & O.N. Co., Alexandria Bay, N.Y., General Agent, Passenger Department, with territory covering New York State west to Syracuse, New Jersey, Pennsylvania east of Pittsburg, Delaware, Maryland, Virginia and Washington, D.C. Office, New York City.

HUGH D. PATERSON, General Agent Passenger Department, in charge of city and dock ticket offices in Toronto, Hamilton, Lewiston, Queenston, Niagara on the Lake and Alcott, with jurisdiction over passenger matters from Sharbot Lake west in Ontario, and the State of Michigan. Office, Toronto.

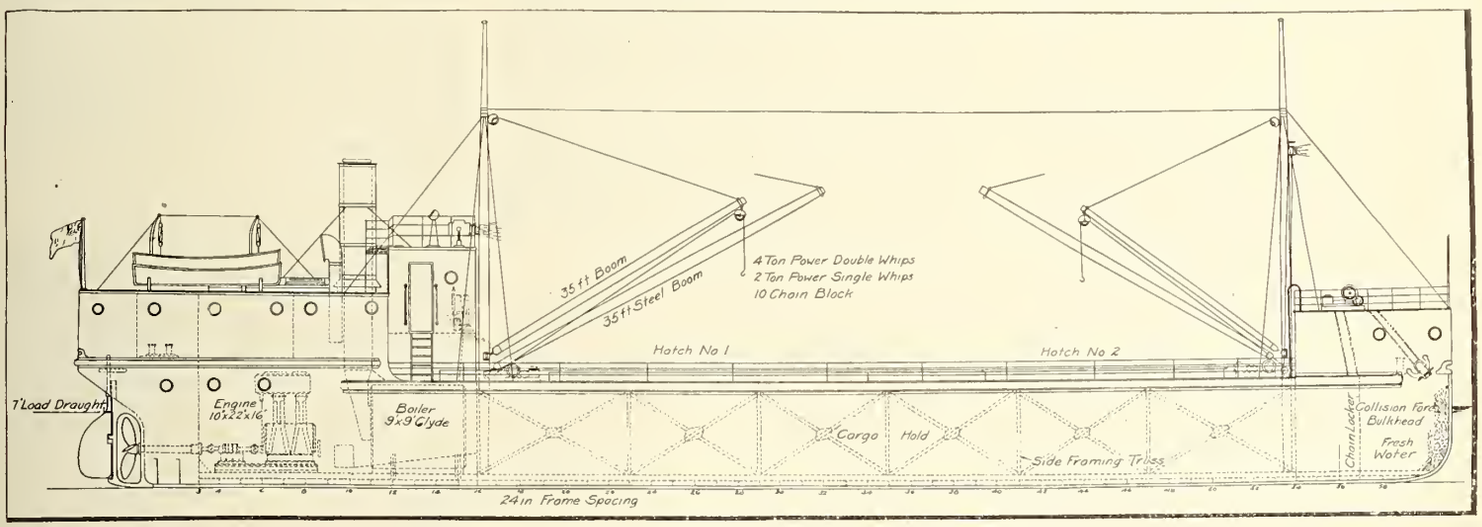
J. V. FOY, heretofore District Passenger Agent, R. & O.N. Co., Toronto, General Agent, Passenger Department, with territory covering Illinois, Missouri and Arkansas and west to the coast. Office, Chicago, Ill.

GEORGE PUJOS, Excursion Agent in charge of Ticket Department, reporting to the Passenger Traffic Manager. Office, Montreal.

S. J. MURPHY, heretofore Travelling Passenger and Excursion Agent, Niagara River Line, R. & O.N. Co., Toronto, Travelling and Excursion Agent, reporting to the General Agent Passenger Department, Toronto. Office, Toronto.

H. J. CRAWFORD, Travelling Passenger Agent, Rochester, N.Y., reporting to General Agent, Passenger Department, Buffalo, N.Y.

C. C. BONTER, Special Agent, Montreal, reporting to Assistant General Passenger Agent and General Baggage Agent, Montreal.



Dominion Government Steel Steam Lighters for Hudson's Bay Service.

Dominion Government Steam Lighters for Hudson Bay.

The Department of Railways and Canals has ordered two steel steam lighters from Polson Iron Works, Toronto, for use at Port Nelson, Hudson Bay. They are to be of steel construction throughout, equipped with ice belt and docking keels, and with watertight collision bulkheads. The propelling machinery will consist of fore and aft compound, surface condensing engines with attached air and auxiliary feed and bilge pumps, the engine cylinders being 10 and 22 ins. diar. by 16 ins. stoke. Steam will be supplied by a Scotch marine type boiler 9 by 9 ft., and built under Government inspection for 160 lbs. working pressure. A full equipment of spare parts for the main engines and pumps, and a miscellaneous outfit will also be supplied. Each lighter will be equipped with two 15 ton cranes and two 4 ton cranes, steam winches, steam windlass, steam steering gear, wrecking pump, sanitary pump, water filters and complete electric lighting equipment. Living quarters for 10 men will be provided aft on a raised deck. The dimensions will be,—length over all 128 ft., length between perpendiculars 120 ft., moulded breadth 21½ ft., depth from bottom of keel to deck at side 10¼ ft., draught loaded 7 ft. Delivery is to be made by June 1.

Wireless Telegraphy on Canadian Vessels

The act providing for the compulsory installation of wireless telegraph equipment on certain vessels leaving Canadian ports came into effect, Jan. 1. The section giving details as to what vessels must be so equipped was given in full in Canadian Railway and Marine World for Oct., 1913. The majority of Canadian vessels which come under the act have already been equipped with the necessary wireless telegraph installation, but there are a few for which, at the time of writing, application for the necessary licenses have not been made. Of these, three operated last season on the Pacific coast, seven or eight on the Great Lakes, and one on the Atlantic coast. If, therefore, it is intended that these vessels are to be operated during the forthcoming season, as last, the installations must be made before the season opens.

Following is a list of Canadian registered vessels which have been equipped for wireless telegraphy by the Marconi Wireless Telegraph Co.:—

Newfoundland and Atlantic Coast:—Reid Newfoundland Co., Bruce, Invermore, Kyle, Lintrose; Harvey and Co., Bellaventure and Bonaventure; Job Bros., Beothic and Nascopie; C.P.R., St. George; Canada Atlantic and Plant Line, A. W. Perry, Evangeline and Halifax; Boston and Yarmouth Steamship Co., Boston, Prince Arthur and Prince George; Dominion Coal Co., City of Sydney, Douglas H. Thomas and Morwenna; J. A. Farquhar, Seal; Holliday Bros., Aranmore; Quebec Salvage and Wrecking Co., Lord Strathcona; Dominion Government, Aberdeen, Acadia, Canada, Dollard, Druid, Earl Grey, Lady Grey, Lady Laurier, Lurcher (light ship), Minto, Montcalm, Montmagny, Niobe and Stanley.

Great Lakes—C.P.R., Alberta, Assiniboia, Athabasca, Keewatin, Manitoba; Northern Navigation Co., Hamonic, Huronic, Noronic, Saronic; Canadian Towing and Wrecking Co., Empire and Province (barges), and St. Ignace; Dominion Government, Simcoe.

Pacific Coast:—Dominion Government, Estevan, Galilano, Malaspina, Margaret, Newington, Quadra and Rainbow; Union Steamship Co., Camosun; British Columbia Salvage Co., Salvor; R. Dollar, Robert Dollar; Grand Trunk Pacific Coast Steamship Co., Prince Albery, Prince George, Prince John and Prince Rupert; C.P.R., Monteagle, Princess Adelaide, Princess Alice, Princess Beatrice, Princess Charlotte, Princess Ena, Princess Mary, Princess May, Princess Royal, Princess Sophia, Princess Maquinna, Princess Victoria and Tees.

Of the foregoing vessels, the Dominion Government steamships Simcoe and Margaret are having the equipment installed, and the Northern Navigation Co.'s s.s. Noronic has just been completed. In addition to the vessels mentioned above, which are all engaged in purely Canadian or local service, there are a number of ocean vessels running to and from Canada, which are also equipped with the Marconi system, including the C.P.R. steamships on the Atlantic and Pacific oceans, the Canadian Northern Steamships' vessels, and numerous others.

Marine Casualties in 1913.—A cablegram from London, Eng., states that marine insurance losses during 1913 were unusually heavy, aggregating $35,000,000. During the 11 completed motnhs of the year 5,332 accidents of all descriptions to vessels were reported, 1,820 being collisions, 1,532 strandings, 895 weather damage, and 423 fires and explosions. The number of vessels reported totally lost was 216, of which 62 were British.

St. Lawrence & Chicago Steam Navigation Co.'s Annual Report.

Following are extracts from the report for the year 1913 as presented at the annual meeting in Toronto, Jan. 13:—

The season of 1913 has been a satisfactory one financially to vessel interests on the Great Lakes. We regret, however, that in common with many other companies, we suffered from the unprecedented storm of Nov. 9 in the loss of the s.s. James Carruthers with many valuable lives, and we take this opportunity to extend our sincere sympathy to the bereaved families and relatives of our officers and men. We are pleased to state that the policy regarding insurance which you authorized some years ago has proved exceedingly satisfactory. We have collected $272,794.09 from the underwriters on the s.s. James Carruthers and after providing for the full balance of her cost out of our insurance fund, we still have the substantial sum of $61,096.94 at the credit of that account.

On account of the increasing business offering, your directors have placed an order for a large modern side tank steamer for delivery next autumn, and very satisfactory progress has been made in her construction to date. To meet the cost of this vessel your directors issued $140,000 of new capital stock, offering the same to the shareholders at par.

The directors, from the earnings of the season, have paid a dividend of 8%, amounting to $68,800 and have carried forward the balance $63,504.61 to the credit of profit and loss, which added to the previous balance makes $222,150.57 at credit of that account.

ASSETS.

Four steamships—Iroquois, W. D. Matthews, G. R. Crowe, and E. B. Osler	$900,000.00
New steamship, expended to date	50,000.00
Bills receivable	20,000.00
Balance in Dominion Bank	315,935.57
	$1,285,935.57

LIABILITIES.

Capital stock, old issue	$860,000.00
Received on new issue	40,875.00
	$900,875.00
Accounts and bills payable	101,813.06
Balance in insurance fund after deducting loss on s.s. James Carruthers less insurance recovered from underwriters	61,096.94
Balance of profit and loss carried forward	222,150.57
	$1,285,935.57

PROFIT AND LOSS ACCOUNT.

Balance forward Jan. 2, 1913		$158,645.96
Steamship earnings	$150,161.53	
Interest	1,500.40	
		151,661.93
		$310,307.89
Cost of management		$ 19,357.32
Dividend 8% payable Jan. 2, 1914		68,800.00
Balance carried forward		222,150.57
		$310,307.89

At the annual meeting bylaws were passed authorizing the directors to borrow money from the Dominion Bank should it become necessary; also respecting the issue of $140,000 of new capital stock.

The directors, who were re-elected for the current year, are:—President, W. D. Matthews; Vice President and Secretary, J. H. G. Hagarty; Managing Director, A. A. Wright; other directors, Jas. Carruthers, Capt. S. Crangle, G. R. Crowe, C. S. Gzowski and Sir Edmund Osler.

Society of Naval Architects and Marine Engineers.

At the annual meeting in New York recently, W. N. McFarland, who presided, in commenting on the use of fuel oil for ship propulsion, said that oil is economical when its cost in cents per gallon is not greater than one half the cost of coal in dollars per ton; i.e., oil at 2c. per gallon is more economical than coal at $4 a ton.

Two papers dealt with the possibility of building unsinkable vessels, and the changes in their structure to accomplish this. Wm. Gatewood, whose paper treated the latter feature, expressed the opinion that subdivision by transverse bulkheads, combined with suitable freeboard, is the logical method of preserving buoyancy and stability; that the proportion of the length of the vessel which may be damaged without danger of foundering should regulate the spacing and height of the bulkheads; and that for a coastwise steamer of standard type, carrying passengers small in number compared with the Atlantic liners, no other subdivision would seem necessary.

H. A. Everett, Assistant Professor of Marine Engineering, at the Massachusetts Institute of Technology, read a paper on the stability of lifeboats, which represented the results of inclining experiments and subsequent stability calculations upon four types of 28 ft. lifeboats:—1st, standard metallic; 2nd, standard wooden; 3rd, metallic; and 4th, collapsible wooden. The tests on the collapsible boat were not reassuring to those who believe in this type, as, even in an unloaded condition, water leaked into the pontoons or chambers between the decks. Of course, in any wooden boat, subject to the weather and wear of service, leakage is bound to occur; but when such leakage occurs in a space where bailing is impossible, the stability and buoyancy are seriously impaired.

Greater Safety at Sea.

The Revision Committee of the International Conference on Safety at Sea, which has been sitting in London, Eng., for some time, discussing rules and suggestions for securing greater safety for passengers and crews at sea, concluded its sittings Jan. 19. If the conclusions arrived at and the suggestions adopted by the committee are approved by the nations concerned, a time limit having been fixed at Dec. 19, 1914, it is provided that the regulations shall go into effect July 1, 1915.

Among a large amount of matters dealt with, the two chief features were the adoption of a plan for an arrangement lengthwise and crosswise of watertight compartments for vessels, which it is stated will make a vessel practically unsinkable; the exemption of passenger vessels carrying less than 50 passengers, or those plying within 100 miles of the shore, from the necessity of being equipped with wireless telegraphy, and the adoption of a miniature life-saving apparatus for children. The President of the conference was Lord Mersey, who presided at the enquiry into the loss of the s. s. Titanic.

The Minister of Marine gave notice in the Dominion House of Commons, Jan. 21, that he would introduce a bill to amend the Canada Shipping Act so as to make its provisions conform to the international regulations adopted at the recent conference in London, Eng., which dealt with matters pertaining to greater safety at sea.

First Vessel Through the Panama Canal.—The passage of the first vessel through the Panama Canal, from the Pacific to the Atlantic, was accomplished, Jan. 7, when the crane vessel Lavalley left the Pacific entrance to the canal. The trip was done by stages, chiefly for the purpose of showing the practicability of navigation through the canal, and no passengers were carried. The Lavalley is 100 ft. long, 40 ft. beam, and 15 ft. draught.

The Wabana-Annie Roberts Collision.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, recently investigated the collision between the British steamship Wabana and the Newfoundland schooner, Annie Roberts, which took place outside Sydney Harbor, N.S., Oct. 22, 1913, whereby the schooner was sunk and four persons drowned. Following is the judgment, concurred in by captains, F. Nash, J. M. Reith, and J. O. Grey, nautical assessors:—

The s.s. Wabana, which was under charter to the Dominion Coal Co., left Sydney, Oct. 22, at 5.25 p.m., for St. John, N.B., with a cargo of coal. On passing Southeast Bar light at about 6 p.m. a course was set (N. 60 W.) which would take her out to the Fairway buoy, and slightly to the southward of the range lights astern. Shortly after this a vessel's red light was sighted slightly on the port bow, and the order was given to port 10 degrees, which was done, and one blast of the whistle sounded. A little later, seeing that the vessel showing the red light was opening out her green light, the engines were stopped, and, as the sailing vessel appeared to be steering wild and yawing considerably, were ordered full speed astern, and the helm put hard aport, and three blasts sounded on the whistle; but the schooner, Annie Roberts, came on across the steamer's bow, apparently having hauled up to the southward, and was struck by the steamer's stem, somewhere amidships, and apparently went down immediately. The Wabana, after going astern for several minutes to keep clear of the Petrie reef to the southward of the fairway, lowered her boat and picked up one man of the schooner's crew, who was found clinging to a plank; but no trace of the other four could be found, although the boat remained in the vicinity for nearly an hour. The schooner was, at the time of the casuality, running back to North Sydney for shelter, having sailed from that port early in the morning, bound to Newfoundland, but on account of the easterly wind and swell encountered during the afternoon had decided to turn back at about 4 p.m., and return to North Sydney, and in running before the wind with only her fore and main sails set, and boomed off wing and wing, and apparently steering no particular course, came into collision with the steamship.

The court, after carefully considering the evidence, is unanimous in its opinion that the collision between these two vessels, and the unfortunate loss of four lives, was entirely due to the negligent way in which the schooner was handled and navigated, as it would appear to the court that the Wabana's lights were apparently not noticed, or perhaps even seen, until that vessel was close to the schooner, and when those on board of her did see them in the panic which ensued, an order was given to "let her come up," which she did, with her head to the southward, with the result that she ran across the bows of the steamship. It would suggest itself to the court that those in charge of the schooner were engaged watching the lights and movements of the s.s. Morwenna, which came up on their starboard quarter, and passed them to starboard, going the same way, a few minutes before the accident, and therefore did not notice the Wabana's lights until she was close to the schooner, and the way the sails were trimmed probably prevented the man at the wheel from seeing ahead. The court is quite satisfied that no blame can be attached to the steamship, and that everything was promptly and properly done by the master of that vessel to try and avoid the collision, and the court is pleased to commend the efficient manner in which the boat from the Wabana was got away, and also the very proper steps that were taken by him immediately on his return to Sydney, in sending a vessel with a search light to the scene of the accident, although the effort was unfortunately quite unsuccessful. The court, although feeling the deepest sympathy for the relations of those who were unfortunately lost, cannot but severely criticize the lack of even ordinary care, and of all knowledge regarding the Rule of the Road, which appear to have existed on board of the Annie Roberts. Such ignorance is not only a danger to the persons themselves, but it is a menace of the gravest character to any ship that may be navigating in their neighborhood.

Floating Equipment for Quebec Harbor Improvements.

The Quebec Harbor Commissioners have ordered three five-pocket steel dump scows of 300 yds. capacity, and three seven-pocket steel dump scows of 500 yds. capacity from Polson Iron Works, Toronto.

The five-pocket dump scows will be built of steel throughout, with oak doors in the hoppers, the doors being operated by hand through a worm gearing. Their dimensions will be, length 108 ft., moulded breadth 28 ft., moulded depth 9 ft.

The seven-pocket dump scows will also be built of steel throughout with oak doors in the hoppers, operated by patent steam winding gear with double cylinder 8 by 8 ins. engines placed in the hold. Their dimensions will be, length 144 ft., moulded breadth 31 ft., moulded depth 11½ ft.

Delivery is to be made in Quebec by the opening of navigation.

An action by W. J. Conners, of Buffalo, N.Y., against a U. S. weekly paper, for $100,000 damages for libel, in connection with a contract held by him in 1900 for the construction of a grain elevator for the Montreal Harbor Commissioners, and which came before the Supreme Court at Buffalo, recently, was, it was announced, settled out of court, the terms not being made public. Mr. Conners was awarded the contract, and made a deposit of $53,000, and after doing some preliminary work, withdrew, the Commissioners retaining $6,000 as compensation. The periodical alleged that he surrendered the contract, to enable a contracting company in which he was financially interested, to get the contract at an enhanced figure.

List of Steam Vessels Registered in Canada during December, 1913.

No.	Name	Port of Registry	When and Where Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134013	Edward C. Whalen	Port Arthur, Ont.	Port Arthur, Ont	1913	76 0	19 1	10 0	113	77	35n.h.p. sc.	James Whalen, Port Arthur, Ont.
130044	Malaspina	Ottawa, Ont.	Dublin, Ireland	1913	162 4	27 1	13 1	392	129	161 " "	Dublin Dockyard Co., Dublin, Ireland. (c)
130629	Mouton	Yarmouth, N.S.	Liverpool, N.S	1913	82 0	17 0	6 8	53	36	14 " "	Neville Canneries, Ltd., Halifax, N.S.
134014	Noronic	Port Arthur, Ont.	Port Arthur, Ont	1913	362 0	52 0	24 8	6905	3935	328 " "	Western Dry Dock & Shipbuilding Co., Port Arthur, Ont. (d)
134133	Q. H. C. Dredge No. 1	Quebec, Que.	Elbing, Germany	1913	187 0	34 5	14 7	748	420	108 " "	Quebec Harbor Commission, Quebec, Que.
134012	Roi Tan (a)	Port Arthur, Ont.	Buffalo, N.Y.	1876	66 5	16 3	8 0	61	41	10 " "	Thunder Bay Contracting Co., Port Arthur, Ont.
134011	Sarnian (b)	" " "	Cleveland, O.	1893	331 8	41 5	22 0	2656	1710	146 " "	Canada Interlake Line, Ltd., Toronto.

(a) Formerly Pacific. (b) Formerly Chili. (c) Owned by Dominion Government, Marine Department. (d) Owned by Northern Navigation Co., Sarnia, Ont.

List of Sailing Vessels and Barges Registered in Canada during December, 1913.

No.	Name	Port of Registry	Rig	When and Where Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
131203	Bessie A. Crooks	Liverpool, N.S.	Schr	Liverpool, N.S.	1913	110 6	28 6	10 4	199	A. Crooks, M.O., Liscombe, N.S.
134158	C. S. & G. No. 1	Montreal	Scow	Beauharnois, Que.	1912	145 5	28 5	6 8	284	Canadian Sand & Gravel Co., Montreal.
134159	" " 2	"	"	" "	1912	141 1	28 8	6 9	228	" " " " "
134160	" " 3	"	"	" "	1912	142 3	28 2	7 0	233	" " " " "
134221	" " 4	"	"	" "	19 2	51 3	17 7	2 8	64	" " " " "
134222	" " 5	"	"	" "	1912	36 6	15 9	2 2	10	" " " " "
134223	" " 6	"	"	" "	1912	98 7	34 3	6 5	185	" " " " "
134171	Effie May Petite	Shelburne, N.S.	Schr	Allendale, N.S.	1913	89 4	25 2	9 0	83	J. Petite, English Harbor, Nfld.
60969	Kaleva (a)	Halifax, N.S.	Barge	Glasgow, Scotland	1869	215 6	35 1	20 0	1039	C. Brister & Son, Halifax, N.S.
52322	Laugen (b)	" "	Schr	" "	1865	224 4	34 2	22 5	1221	" " " "
134156	Laurin & Leitch No. 5	Montreal	Scow	Montreal	1912	76 1	22 0	6 8	91	T. Bastian, J. Laurin and W. C. Leitch, J.O., Montreal.
13 760	Lobnitz P.W.D. No. 3	St. John, N.B.	Dredge	Renfrew, Scotland	1912	100 0	36 2	8 8	389	Minister of Public Works, Ottawa, Ont.
134192	McLean No. 2	Sault Ste. Marie, Ont.	Scow	Sault Ste. Marie, Ont.	1911	80 0	24 0	6 5	125	A. B. McLean, Sault Ste. Marie, Ont.
134157	Mary Lyon	Montreal	Barge	Port Huron, Mich.	1874	142 0	26 3	11 9	310	A. Desrosiers, Lanoraie, Que.
13 075	P.W.D. No. 313	Vancouver, B.C.	Dredge	North Vancouver	1913	76 0	35 0	6 0	208	A. Wallace, North Vancouver, B.C.
131100	Susan E. Inkpen	Shelburne, N.S.	Schr	Shelburne, N.S.	1913	101 0	23 3	10 0	99	L. Inkpen, Burin, Nfld.

(a) Formerly Zealandia, recovered wreck. (b) Formerly Ruthin, recovered wreck.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

438. Dec. 20. British Columbia, Kootenay Lake, west arm, beacon lights established.

439. Dec. 20. British Columbia, Kootenay Lake, Kootenay Landing, range lights established.

440. Dec. 20. British Columbia, Slocan Lake, Silverton, light established.

441. Dec. 20. British Columbia, Columbia River, beacon lights established.

443. Dec. 26. New Brunswick, Bay of Fundy, Grand Manan Island, Seal Cove, buoy established off Wilcox Point.

444. Dec. 26. New Brunswick, St. John River, Belleisle Bay, Shampers wharf, lighthouse established.

442. Dec. 20. British Columbia, Columbia River, Upper Arrow Lake, Arrowhead, day beacon established.

445. Dec. 26. British Columbia, west coast, Barkley Sound, Ucluelet Arm, day beacon erected.

446. Dec. 26. United States of America, Washington, Juan de Fuca Strait, Cape Flattery light station, intended change in character of light.

447. Dec. 26. United States of America, Washington, Juan de Fuca Strait, New Dungeness light station, intended change in character of light.

448. Dec. 30. Canada, list of wireless telegraph stations.

449. Dec. 31. Ontario, Georgian Bay, Nottawasaga Island, new illuminating apparatus.

450. Dec. 31. Ontario, Lake Couchiching, southern end, buoy to be established.

451. Dec. 31. British Columbia, Haro Strait, Discovery Island light station, new fog alarm building, change in fog alarm.

452. Dec. 31. British Columbia, Chatham Sound, Prince Rupert, Pillsbury Point, characteristic of fog bell, correction.

1. Jan. 2. New Brunswick, Bay of Fundy, Grand Manan Island, southwest head, change in character of light.

2. Jan. 7. Nova Scotia, Bay of Fundy, St. Mary Bay, Sissiboo River mouth, dredging, buoyage, position of lighthouse.

3. Jan. 7. Nova Scotia, south coast, entrance to Halifax harbor, Sambro outer bank, light ship placed for winter months.

4. Jan. 7. Nova Scotia, Cape Breton Island, east coast, Sydney harbor, obstruction north of Whitney pier marked by buoy.

5. Jan. 8. New Brunswick, Bay of Fundy, Deer Island Leonardville, lighthouse established.

6. Jan. 8. New Brunswick, south coast, Bay of Fundy, Passamaquoddy Bay, Chamcook harbor, lighthouse established.

7. Jan. 8. Nova Scotia, west coast, Peases Island, intended change in character of light.

8. Jan. 13. British Columbia, Vancouver Island, west coast, Barkley Sound, Amphitrite Point, light carried away, temporary light.

9. Jan. 13. British Columbia, Vancouver Island, east coast, Hammond Bay, light discontinued.

10. Jan. 14. Ontario, River St. Lawrence, Thousand Islands, Gananoque Narrows light station, hand fog horn discontinued.

11. Jan. 14. Ontario, Lake Ontario, Simcoe Island, Ninemile Point, intended change in character of light.

12. Jan. 14. Ontario, Lake Erie, Port Stanley, fog alarm established on west breakwater.

13. Jan. 14. Ontario, Georgian Bay, Meaford west pier, hand fog horn discontinued.

14. Jan. 16. Nova Scotia, Bay of Fundy, Lurcher Shoal, wireless telegraph apparatus installed on lightship.

15. Jan. 16. Nova Scotia, Bay of Fundy, Minas Basin, Five Islands, lighthouse established on Sand Point.

16. Jan. 16. Nova Scotia, southwest coast, Baccaro Point, intended change in character of light.

17. Jan. 16. Nova Scotia, Halifax harbor, alteration in Examination anchorage.

18. Jan. 16. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Grondines upper range, back light improved.

19. Jan. 16. Labrador, east coast, Cape Harrigan, shoals to northward.

20. Jan. 20. Prince Edward Island, southwest coast, West Point, intended change in character of light.

21. Jan. 20. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Lake St. Peter, Pointe du Lac range, front light to be improved.

22. Jan. 21. Caution when approaching Canadian ports.

23. Jan. 21. Canada, signals to be made by vessels approaching ports when inconvenienced by searchlights.

Atlantic and Pacific Ocean Marine.

The Allan Line s.s. Alsatian sailed from Liverpool, Eng., for Halifax, N.S., Jan. 17, on her maiden voyage.

The Allan Line Orcadian, which has been running for some time in the River Plate trade, is reported sold to Italian purchasers for £14,000.

The C.P.R. s.s. Montrose, which sailed from Halifax, N.S., Jan. 2, was compelled to put back to port on the following day, owing to a breakdown of her engines.

Furness, Withy and Co., it is reported, have ordered four additional steamships for the North Atlantic trade. Two of these, it is said, will be built on the Tyne, and two at Middlesbrough, Eng.

The new Cunard liner Aquitania will possess the largest turbine engines ever built. They will weigh 1,400 tons and will contain over 1,000,000 blades, varying from 1½ to 20 ins. long. The engines will contain high, intermediate, and low pressure turbines.

The Royal Mail Steam Packet Co's. s.s. Carnarvonshire was launched recently at Belfast, Ireland. She will be operated to the British Columbia coast, via the Suez Canal, with her sister vessel Cardiganshire, now on her maiden trip, and is expected at Victoria early in March.

Capt. H. F. Letson, heretofore Assistant Marine Superintendent, Cunard Line, New York, is reported to have been appointed Marine Superintendent for the same company's services to Halifax, Montreal and Boston, with headquarters at Boston, Mass.,

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during 1913.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	4,239	81,139	85,378
Grain	"	Bushels	49,473,309	62,756,660	112,229,969
Building stone	"	Short tons	5,700	481	6,181
Flour	"	Barrels	2,248,445	7,961,919	10,210,364
Iron ore	"	Short tons	32,404,398	15,672,579	48,076,977
Pig iron	"	"		22,760	22,760
Lumber	"	M. ft b.m.	24,781	574,805	599,586
Silver ore	"	Short tons			
Wheat	"	Bushels	132,202,313	72,619,194	204,821,507
General merchandise	"	Short tons	69,680	333,388	403,068
Passengers	"	Number	13,751	24,008	37,759
Coal, hard	Westbound	Short tons	543,620	2,200,954	2,744,574
Coal, soft	"	"	3,607,111	12,271,253	15,873,364
Flour	"	Barrels	1,600	703	2,303
Grain	"	Bushels		400	400
Manufactured iron	"	Short tons	117,158	262,994	380,152
Iron ore	"	"	32,376		32,376
Salt	"	Barrels	79,573	650,858	730,431
General merchandise	"	Short tons	605,943	761,849	1,367,792
Passengers	"	Number	22,947	16,488	39,435
Summary.					
Vessel passages		Number	8,196	15,599	23,795
Registered tonnage		Net	25,927,096	32,062,619	57,989,715
Freight—Eastbound		Short tons	37,778,408	21,427,445	59,205,853
" —Westbound		"	4,917,735	15,594,756	20,512,491
Total freight		"	42,696,143	37,022,201	79,718,344

COMPARATIVE STATEMENT FOR THE SEASONS 1912 AND 1913.

Items		Season 1912	Season 1913
Vessels: Steamers	Number	19,076	19,789
Sailing	"	1,805	1,992
Unregistered	"	1,897	2,014
Total	"	22,778	23,795
Lockages	"	16,088	16,867
Tonnage: Registered	Net	56,736,807	57,989,715
Freight	Short	72,472,676	79,718,344
Passengers	Number	66,877	77,194
Coal: Hard	Short tons	2,142,485	2,744,574
Soft	"	12,789,109	15,878,364
Flour	Barrels	8,652,153	10,212,667
Wheat	Bushels	174,086,456	204,821,507
Grain	"	60,024,546	112,230,369
Manufactured and pig iron	Short tons	654,892	402,912
Salt	Barrels	660,991	730,431
Copper	Short tons	116,954	85,378
Iron ore	"	46,303,423	48,109,353
Lumber	m. ft. b.m.	667,542	599,586
Building stone	Short tons	2,282	6,181
General merchandise	"	1,664,783	1,770,860

The Canadian canal was opened April 14, and closed Dec. 15, 1913; season, 246 days.
The U.S. canal was opened April 18, and closed Dec. 18, 1913; season 235 days.

succeeding Capt. A. Ashley, recently deceased.

The C.P.R. s.s. Metagama will probably be launched during May, and the s.s. Missanabie about August. Both these vessels are under construction in Scotland for the C.P.R. Atlantic service. They will be about 12,000 tons, twin screw type, with accommodation for 520 second class and 1,200 third class passengers.

A press report from Paris, France, Jan. 21, states that at the North Atlantic Shipping Conference it was announced that all existing agreements in relation to the pooling of the traffic expired on that date. The request of the Hamburg-American Line for a larger percentage of the transatlantic steerage traffic was refused.

The Canadian Northern Steamships s.s. Principello, formerly Principe di Piedmonte, and owned by Genoese parties, and which has been leased to the Uranium Steamship Co., in place of the s.s. Volturno, recently burnt at sea, is reported to have cost £120,000 to build in 1907. The price said to have been paid for her by the present owners is £135,000.

The Osaka Shosen Kaisha, one of the largest shipowning companies in Japan, is reported to be arranging for a freight and passenger service between Japan and Montreal, by way of the Suez Canal, and returning to the Orient via the Panama Canal. A representative of the company was in Montreal and the Maritime provinces recently studying harbor conditions.

A London, Eng., press dispatch states that it has been agreed amongst all the chief Canadian steamship lines on both the Atlantic and Pacific oceans, to grant substantial increases of pay to the captains and officers of their vessels, dating from Jan. 1. In addition, it is stated, that allowances will be given to officers when the vessel is laid up at home ports, also an annual bonus, and three weeks holiday on full pay.

The Reid-Donald Steamship Co., Ltd., the incorporation of which was announced in a recent issue, is operating a steamship between New York and the West Indies, and, it is reported, has another under construction. The company has an authorized capital of $100,000. Following are the officers and directors,—President, J. A. Donald, New York; Vice President, D. Reid, New York; other directors, C. I. De Sola, T. Muirhead and G. Farrill, Montreal.

The Austro-Americana Line's s.s. Canada, which was purchased from the Hamburg American Line last year for its service between Canada and Austria as a competitor of the C.P.R., and which was formerly known as Bulgaria, has been resold to the Hamburg American Line. The Austro-Americana Line is a subsidiary of the Hamburg American Line, and was merely formed for the operation of the Canadian Austrian service. Reports do not indicate that the Austrian service has been discontinued.

The enquiry into the loss at sea of the Canadian Northern Steamships s.s. Volturno, under charter to the Uranium Steamship Co., has just been concluded in London, Eng. The court found that the cumulative effect of the evidence was, that the fire originated among the chemicals carried as cargo, but it could not be attributed to spontaneous combustion. A tribute was paid to the officers and crew of their conduct, concluding with a reference to Capt. Inch, in the words, "it is sufficient to say he did his duty."

The Manchester Liners s.s. Manchester Commerce, which was docked at the Reid Newfoundland Co.'s dock at St. John's, Nfld., for repairs, after colliding with an iceberg in Belle Isle Strait in Oct., 1913, was floated out of the dock, Jan. 13. The repairs covered the removal and replacing of 60 damaged plates, the erection of a new stem, and a number of lesser repairs, which the contract required to be completed in 50 days. The whole work was completed in 47 days, under the charge of W. E. Ladley, superintendent of Motive Power, R. N. Co.

The Royal Mail Steam Packet Co's. s.s. Cobequid, en route from the West Indies to Halifax, N. S., ran ashore on the southwestern end of the Trinity Ledges in the Bay of Fundy, during a heavy storm, Jan. 13, and became a total loss. Owing to the continuance of the storm, and the discontinuance of the wireless telegraphy, due to the fires having been put out, and there being no reserve power to operate the equipment, the wreck was not located until the following day, when the passengers and crew were rescued by the steamships Westport and John L. Cann.

Maritime Provinces and Newfoundland.

The Eastern Steamship Corporation, operating a steamship line between Yarmouth, N.S., and Boston, Mass., will run four round trips each week, between these ports, commencing with March. This is an increased service.

It is reported that the Reid Newfoundland Co. will probably order a new steamship shortly, to be built in Scotland, to take the place of the s.s. Duchess of Marlborough, which was wrecked at Battle Harbor last year.

The Department of Public Works announces that a channel, 8 ft. deep at low water and 100 ft. wide, has been dredged through the bar at the mouth of the Sissiboo River, St. Mary Bay, in the Bay of Fundy, N.S. The channel has not yet been swept clean, and it is known that there are some lumps in it at less than standard depth. It is intended eventually to deepen and straighten the channel up to Weymouth bridge.

Maritime and Newfoundland Steamship Co., Ltd., has been incorporated under the Dominion Companies Act, with $150,000 capital, and office at Halifax, N.S., to carry on a general shipping business, and in connection therewith to own and operate steam and other vessels, and to carry on a general towing and wrecking business. The incorporators are: J. G. Farquhar, C. W. Rowlings, O. E. Smith, Hon. A. W. Redden and A. N. Whitman, Halifax.

An order in council has been passed, providing that steamships of not less than 2,000 tons gross, belonging to Norway, Sweden, Austro-Hungary and Japan, shall be admitted to the Canadian coasting trade in carrying freight and passengers between any port in Nova Scotia and any port in Quebec, and vice versa, on the same conditions as are applicable to Canadian vessels, until Dec. 31, 1914. The vessels chiefly affected are those engaged in the coal trade.

The Dominion Coal Co.'s s.s. Bridgeport, which sailed from Sydney, N.S., in October, for Montreal, with coal, and has not since been heard of, has been posted as missing at Lloyd's. It is reported that the loss on the hull is £64,000, and on the cargo £10,000. She was owned by Brown, Jenkinson and Co., London, Eng., and leased to the Dominion Coal Co., having been built specially for that trade. The s.s. Glace Bay, a similar vessel, owned by the same company, and chartered by the Dominion Coal Co., was also lost on the same route earlier in the year.

At the annual meeting of the Miramichi Steam Navigation Co., at Chatham, N.B., Jan. 13, the report showed that the earnings for 1913 were in excess of those for the previous year, but on account of the heavy expenditure for alterations and improvements on the steamboats Alexandra and Sybella H., no dividend was declared. The officers for the current year are:—President, Hon. J. P. Burchill; Vice President, J. D. Creaghan; other directors, W. B. Snowball, R. A. Snowball, J. D. B. F. Mackenzie, John McDonald; Secretary and Manager, H. B. McDonald.

Province of Quebec Marine.

The Montreal Harbor Commissioners took their customary New Year trip down the harbor, on their steam tug Sir Hugh Allan, Jan. 2.

Reports for the navigation season of 1913 show a considerble increase in the export of grain from Montreal, and also in general freight and passenger traffic. During the season, 62,565,000 bush. of grain were received there, of which 53,351,000 were for export, as compared with 37,800,000 in 1912.

The Quebec and Lotbiniere Navigation Co., Ltd., has been incorporated under the Quebec Companies Act, with $75,000 capital, and office at Ste. Croix, to carry on a general passenger and freight transportation business within the province. J. H. Boisvert, Quebec, Que., E. Boisvert, St. Antoine, D. Boisvert, Ste. Croix, S. Boisvert, Quebec, J. A. Boisvert, St. Raymond and G. Boisvert, Quebec, are the provisional directors.

La Compagnie de Navigation de Matane et Sept Isles has been formed in Quebec, Que., to establish a weekly winter steamboat service, as well as a summer service, between Matane and Seven Islands. It is stated that the scheme is quite feasible during the winter, especially for a small vessel, as the ice is constantly moving. J. A. Fafard is President of the company, which has the support of the Quebec Board of Trade.

It is reported that Canada Steamship Lines, Ltd., will probably order a new steamship to take the place of the s. s. Longueuil plying across the St. Lawrence, at Montreal. It is also announced that the company will shortly take up the matter of a service between Quebec and Bermuda, in which it is considered there are good possibilities. Its subsidiary, the Quebec Steamship Co., already operates a direct line between New York, Bermuda and other West Indian ports.

The Quebec and Levis Boards of Trade have protested against the breaking up of the ice formation in the St. Lawrence River at Cap Rouge, as it has the effect of blocking up the harbors at Quebec and Levis, and interfering with the navigation between the two ports. It is claimed that these two ports are the only two opposite each other on the St. Lawrence, between which a considerable trade is done throughout the winter, and that the means of communication should not be affected by what is stated to be a really useless breaking up of the ice. Local authorities state that the work done by the ice breakers does not in any way assist in the earlier opening of navigation, and even if the channel between Quebec and Montreal were opened earlier the shipping companies would still carry out their schedules to the seaboard.

Ontario and the Great Lakes.

The Ontario Car Ferry Co.'s car ferry steamship Ontario no. 1 has been equipped with a wireless telegraph apparatus for testing purposes.

The Canada Steamship Lines s.s. Dundurn arrived in Toronto harbor, crossing

the lake from Port Dalhousie, Jan. 1. It is reported that she will have a complete overhauling, and a number of extensive repairs during the winter.

Sprinkler equipments are now carried in a number of vessels plying on the Great Lakes. The cost of installation prevents equipments in many boats just as it does in the case of factories, but there is no doubt about its advisability.

The 1913 season is reported to have been the worst in the history of lake navigation for vessel losses, the approximate total loss being $6,000,000, with a heavy loss of life. The great storm of Nov. 9 was the chief cause of the high loss.

The operator at the Point Edward wireless telegraph station has been presented with an engraved gold locket by Pickands, Mather and Co., managers of the Interlake Steamship Co., Cleveland, Ohio, in recognition of his services during the storm on the Great Lakes, on Nov. 9, 1913.

As the result of an investigation by the Dominion Government, locally, the crew of the lightship stationed off the Corsica Shoal, near Sarnia, were exonerated from charges of neglect of duty during the storm of Nov. 9. The enquiry was the result of local rumors to the effect that the vessel had been mishandled.

The large freight steamship which is under construction at Port Arthur, and which is said to be for Canada Steamship Lines, Ltd., will probably be launched soon after the opening of navigation. The work on the hull is progressing satisfactorily, and the engines, which have been built in Cleveland, O., have been received.

The Montreal Transportation Co.'s electrically propelled vessel Tynemount, a description of which has already been given in Canadian Railway and Marine World, and which is intended for service on the Great Lakes, sailed from the Tyne, Eng., recently, on her maiden voyage, to Santander, Spain. It is said that before coming to Canada, she will make a number of short sea voyages.

The Montreal Transportation Co.'s annual meeting was held at Montreal recently. Following are the officers and directors for the current year:—President, B. McLennan; Vice President, Farquhar Robertson; Managing Director, L. L. Henderson; other directors, T. A. Crane, A. Kingman, F. McLennan and A. G. Thomson; Secretary, W. Crawford.

The Dominion Government is reported to have awarded a contract to Jennings and Ross, for the construction of a large dam at the head of the Big Chaudiere, French River, at prices aggregating about $23,124.40. This is said to be a portion of the French River improvement work, which is being undertaken as a preliminary to the proposed Georgian Bay canal undertaking.

A press report of Jan. 20, stated that a large amount of machinery had arrived on the site of the new Welland Ship Canal, five sections of which are under contract. Some of this machinery, it is said was used on the construction of the Panama Canal. The Provincial Government has issued instructions regarding the prohibition of the sale of intoxicants within the canal area.

The Ontario Transportation and Pulp Co., Ltd., has been incorporated under the Dominion Companies Act, with $10,000 capital and office at Thorold, Ont., to own and operate steam and other vessels in the passenger and freight trade, and to deal in pulpwood, etc. The incorporators are, W. Curtis, Jr., G. S. Brack, F. A. Dean, Jr., G. V. McCune, Thorold, Ont., and R. R. McCormick, Chicago, Ill.

A press dispatch from Ottawa, Jan. 18, states that the channel improvements at Fighting Island, in the Detroit River, for which the Dominion Government included $57,000 in the appropriations last year, will be of a wider scope than at first anticipated. A new channel between 3 and 4 miles long will be dredged, and it is stated that work will be commenced in the spring. Owing to the increasing traffic the additional channel has become a necessity.

A report from London, Eng., states that the cost of 11 total losses of insured vessels on the Great Lakes, during the storm on Nov. 9, 1913, was £483,600. The value of cargoes carried by 18 vessels known to have been lost amounts to a further £160,000. Seven vessels, apparently uninsured, which were also wrecked, are not included in the foregoing figures. The value of these vessels is given as £296,200, making the total estimated loss to shipping property £1,243,200.

The past year was one of great progress on the New York State barge canal, and it looks as though within about two years' time it will be possible for 1,000-ton barges to pass between the Great Lakes and the Atlantic, by way of the Hudson River.

A press report from Sarnia, states that the Northern Navigation Co.'s s. s. Saronic, which has been running between Sarnia and the head of the lakes for several years, will, on the reopening of navigation, be placed on the route between Toronto and Montreal.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for Dec., 1913, as follows:—Superior, 602.74; Michigan and Huron, 580.35; Erie, 572.14; Ontario, 245.91. As compared with the average December levels for the past ten years, Superior was 0.42 ft. above; Michigan and Huron, 0.15 ft. above; Erie, 0.45 ft. above, and Ontario 0.39 ft. above. It was anticipated that during January, Superior would fall about 0.3 ft., Michigan and Huron about 0.1 ft., Erie remain stationary, and Ontario rise about 0.1 ft.

British Columbia and Pacific Coast Marine.

The G. T. Pacific Coast Steamship Co.'s s. s. Prince John, which has recently had equipment installed for burning liquid fuel, sailed from Victoria, Jan. 5, for Ladysmith, where she loaded coal for Prince Rupert.

A press report from Vancouver states that the Dominion Government has made a grant of practically the whole of the foreshore at Newport, at the head of Howe Sound, to the Pacific Great Eastern Ry., as a seaport, on condition that the company expend $2,000,000 in making harbor improvements.

The Dominion Public Works Department is making a thorough survey of the portion of the Columbia River within Canada, with a view to determining the possibility and probable cost of making the river navigable from its head waters to the international boundary. A report on the progress of the work will probably be made in the spring.

At the White Pass and Yukon Ry. Co.'s annual meeting in London, Eng., in December, O. L. Dickeson, of Vancouver, President of the local companies, referred to the steamboat service established by the company in the lower portion of the Yukon River, to the rate war which resulted, and to the probability of the company establishing a steamship line between Seattle, Vancouver and Skaguay. His remarks are given in full in the report of the annual meeting on another page of this issue.

The Dominion Government is reported to have acquired a site for its projected Pacific coast dry dock, at Lang's Cove, Esquimalt. The plans are being prepared by the Public Works Department, and it is stated that tenders will probably be called for early in the spring. It is estimated that the cost of the dock will be about $4,000,000. The dimensions will be, length 1,150 ft., depth 40 ft., and width 120 ft., or practically a duplicate of the one which the Government has under contract at Lauzon, Que. It is reported that a similar dry dock will shortly be undertaken at Halifax, N.S.

Investigation of Wrecks on the Great Lakes.

Recent press reports stated that a commission had been, or was about to be, appointed, by the Dominion Government, to investigate the wrecks resulting from the great storm on the lakes on Nov. 9, and that Capt. J. B. Foote, of Toronto, had been named as one of the commissioners by the Dominion Marine Association. Though the question of appointing such a commission is under consideration, we are officially advised that no appointments have been made, nor has the question as to whether a commission is to be appointed, been definitely decided.

The origin of the report relating to Capt. Foote, is the recommendation of a joint meeting of the executive committees of the Dominion Marine Association and the Canadian Lake Protective Association, to the effect that it is advisable, on all wreck investigations relating to casualties on the inland waters, that the court should have with it an assessor familiar with conditions and practice on the lakes, and Capt. J. B. Foote was suggested as one who would be generally approved by all parties concerned.

J. A. Currie, M.P., gave notice in the House of Commons, Jan. 15, of the following resolution:—"That in the opinion of this House an enquiry should be held by a committee of this House regarding the disasters last fall on the Great Lakes and Atlantic Ocean, involving such terrible loss of life, with a view of ascertaining if by legislation such disasters can be avoided in the future, and that such committee have power to call witnesses, examine them under oath, and send for papers and documents, and report to this House from time to time."

Non-magnetic Rails and Track Signaling.—In order to accommodate the increasing use of track and signaling circuits on railways, with the necessity for bonding joints, points, and crossings, and separating rail sections to form the desired electric circuits, it is proposed by a German engineer to use non-magnetic rails. The non-magnetic track rails are made of nickel steel containing about 18 to 20% of nickel, and they are inserted at desired points in the ordinary magnetic track for controlling signals, brakes, etc., from the cars. For light railways, the whole of the track may be formed from these rails, which do not affect the action of the weak electric current used in controlling the railway.

Lloyd's Register of Shipping.—The general committee has appointed W. S. Abell, Professor of Naval Architecture at Liverpool University, to succeed the late Dr. S. J. P. Hearle as chief ship surveyor to the society. C. Buchanan, who was Dr. Hearle's senior assistant, has been appointed Principal of the Chief Ship Surveyor's staff. T. B. F. Benton, A. I. N. A., Toronto, has been appointed Surveyor for District of Lake Ontario and Collingwood, Ont.

Canadian Pacific Railway Dining Car Service Building at Vancouver.

The C.P.R. is erecting at Vancouver, for its dining car service, a building 185¾ by 52¼ ft. with basement and two stories above.

The machinery room in the basement, 32 by 20 ft. will contain a 20 h.p. electric motor, a 10 ton double acting horizontal ammonia compressor, 2 electric pumps for pumping brine through refrigerating pipes, and a 10 ton brine cooler. The ammonia compressor, when working in connection with a condenser and refrigerator of equal capacity, will have a refrigerating power equal to the melting of 10 tons of ice a day, when working continually for 24 hours at 120 revolutions a minute, and with cooling water having temperature of 60 degrees. The compressor will be fixed on a massive cast iron bed plate upon which will be formed girders for crosshead and bearing of crankshaft. The refrigerating pipes will be 2 in. brine pipes inside 3 in. ammonia pipes and will run up to the first floor, encircling the entire four walls of each cold storage room, pipes being laid one above the other the full height of the walls. The rest of the basement will be devoted to storing of supplies, and potatoes will be taken in by a chute which will run down the basement from the north track side of the building.

On the ground floor will be the commissary kitchen, 39 ft. 10½ ins. by 24 ft. 8½ ins. It will contain the latest equipment throughout, including a large range using either coal or coke, large sink for washing milk cans, drain pipe, hot and cold water faucets, etc. There will be a soap room just off the kitchen for manufacturing all soap used, containing vats and all necessary equipment. The kitchen and the bakeshop will be separate rooms connected by a doorway on the north side of the kitchen and the south side of the bakeshop. The bakeshop will contain two large brick bake ovens, movable mixing table, pastry table, movable bread racks, mixing machine, marble slabs, sink, drain boards, etc.

Next to the kitchen and the bakeshop will be eight cold storage rooms, constructed of nonperel cork, which contains 94% of pure cork and 6% of patent binder, making them both damp and mould proof. The floor will consist of two layers of cork, surmounted by a 2 in. concrete top, while the side walls and ceiling will be 5 ins. throughout solid corkbed. It will only be necessary to run the refrigerating machinery 12 hours per day, to keep the cold storage rooms as follows: Vegetable room from 40 to 45 degrees, kitchen refrigerator 32 degrees, ice cream refrigerator 30 degrees, fresh meat room 20 to 32 degrees, salt meat from 20 to 32 degrees, poultry room 32 degrees, fish room 35 degrees, and dairy and produce room 30 to 35 degrees below zero. The entire eight rooms will measure 24 by 43 ft., with an entrance from the kitchen and one from the east side. The dining car stores office, 9ft. 10 ins. by 16 ft. 7 ins. will also be on the ground floor, as well as the wine and equipment room, soiled linen room, clean linen room, and linen room office. The linen room office will be between the clean linen room and the soiled linen room thus keeping the soiled linen at all time from coming into contact with the clean linen.

On the top floor will be the general office, and private office for the Assistant Superintendent. A large clothes closet will open off from the general office as will also the lost property room, and a long narrow filing room. A large store room for bar case goods, and one for dining car stores department case goods will be next to the general office on the north while the rest of the floor will be used for silverware storage room, dining and sleeping cars department linen storage, seamstress room, pressing room, porters' assembly room, and cooks' and waiters' assembly and instruction rooms. There will be two large lavatories on this floor, and hot and cold water will be available at all times. Communication between general office, and porters', cooks' and waiters' assembly rooms will be held by means of large window counters opening directly into the rooms from the office.

There will be two outstanding features about this building, the heating and lighting, both natural and artificial. Fifty-two large radiators will be used in heating, and the electric lighting system will have a 21,500 watt capacity. There will be 102 windows to admit the sunlight.

The laminated floor construction will be unusually strong, in some places carrying as much as 300 lbs. to the square foot, the average weight being 125 lbs. The building is being constructed on heavy concrete piers, and of brick with heavy timber columns supporting the floors. Three staircases will give access to the three floors and there will be elevators, one at the east end and one in the centre of the building. Steel doors will be placed at the entrances to the stairways and the building is being built as nearly fire-proof as possible. The storage space will be very large, viz., 3,000 sq. ft. in the basement and 1,092 sq. ft. on the ground floor. Great difficulty was experienced in getting the basement constructed, it being necessary to contend with from 15 to 18 ft. of water when excavating was started. Two centrifugal pumps, one electric and the other steam driven, were in constant use pumping. The basement now, however, is thoroughly waterproof, and the elevator pits, which go down somewhat lower than the basement floor, are treated with a specially prepared waterproof combination, thus eliminating the possibility of water seeping through the floor.

Summoning Police by Train Wireless.—The wireless equipment now used on the Lackawanna Rd. trains has proved very serviceable on a number of occasions. Recently when a locomotive broke down, another one was summoned by wireless communication and much time was saved. The new means of communication was employed recently to summon two of the road detectives in order to arrest suspected crooks who were found riding between the baggage car and the tender. The detectives were on hand when the train pulled in at Binghamton, N.Y., and placed the men under arrest. No doubt wireless communication between stations and moving trains will prove useful in a thousand and one unexpected situations.

Locomotives Furnished Power during the replacement of a battery of worn out boilers, at the plant of Schaum and Uhlinger, of Philadelphia, Pa., recently. Two American type locomotives were rented from the Pennsylvania Rd., and while these were in operation the old battery of two boilers was replaced. The locomotives, whose connecting rods and valve gears had been disconnected, were hauled to a convenient point on a siding of the plant; their throttle valves were closed, and a connection piped from their auxiliary steam domes over the fireboxes to the main steam headers in the plant.

The C.P.R. has opened a children's nursery adjoining the women's waiting room at Windsor St. station, Montreal. It is equipped with bath tubs, cots and seats for the little ones, and rockers for mothers with infants in arms.

Modification of Express Freight Charges.

The Board of Railway Commissioners' general order 117 of Jan. 9, in the matter of the minimum through charge of express companies subject to the Board's jurisdiction, for shipments of express freight carried by two or more companies in Canada, is as follows:

"On and after Feb. 1, shipments of express freight subject to the table of graduate charges for shipments weighing less than 100 lbs. incorporated in the Express Classification for Canada, approved by the Board, the carriage of which between points in Canada involves the services of two or more express companies, subject to the Board's jurisdiction, shall be charged the appropriate graduate under the lowest through or aggregate rate per 100 lbs.

"Sec. c of rule 9 of the conditions of carriage of the said express classification, imposing, subject to qualification, a minimum through charge of 60c. when the through or aggregate rate per 100 lbs. is less than $2, shall be abolished on and after said date. The said express companies shall, by lawful notice, jointly publish and file an amendment to the said express classification giving effect to this order on the said date.

W. H. Plant, General Auditor, Dominion Express Co., writes: "There has been misunderstanding in connection with the reduction of express charges to be made on Feb. 1. This has been due to examples of reductions having been given without having shown to what traffic the reductions refer. So there may be no confusion, and that the public may understand exactly, the following explanation is given. The order refers: 1. To shipments carried by two or more companies. 2. Between points in Canada. 3. To shipments subject to graduated charges.

Qualifications referred to in the paragraph 2 of the order indicates that when the graduate charge under rate of $2 per 100 lbs. is less than 60c, such graduate charge will apply instead of the minimum. Therefore, the result is, after Feb. 1, section C of rule 9 will be discontinued, and when carried by two or more companies there will then be a single graduate on the through rate, without this minimum. The reductions are as follows:

Weight	(Rate.)				
pounds.	90c.	$1.00.	$1.25.	$1.50.	$1.75.
1	Nil.	Nil.	Nil.	Nil.	Nil.
2	.05	.05	.05	.05	.05
3	.15	.15	.10	.10	.05
4	.20	.15	.15	.10	.05
5	.15	.10	.10	.05	Nil.
6	.25	.20	.15	.10	.05
7	.25	.20	.15	.10	.05
8	.25	.20	.15	.10	.05
9	.20	.15	.10	.05	Nil.
10	.20	.15	.10	.05	Nil.
15	.15	.15	.05	Nil.	Nil.
20	.15	.10	Nil.	Nil.	Nil.
25	.10	.05	Nil.	Nil.	Nil.
30	.05	Nil.	Nil.	Nil.	Nil.

John Pullen, President, Canadian Ex. Co., has issued the following statement: "It is our understanding that the new order is really the outgrowth or the working out to a finality of the judgment of the Board of Railway Commissioners in 1910 in the matter of joint rates on express shipments forwarded from an office of one company to an office of another company. Prior to 1910 these joint or inter company shipments were subject to a through charge made by combining the separate charges of each company. The first step taken as a result of the Board's order in 1910 was to establish a single through charge for two or more companies. The charges so arranged applied only to shipments weighing less than 100 lbs. This arrangement provided for a minimum charge for each of the carrying companies. This was more by way of ex-

periment to see how it would work out. The last and present arrangement waives the minimum charge for each company for the shorter distances, so that on a through shipment weighing several pounds for an office of one company to an office of another company, the former charge on which was 60c. as a minimum, will now be charged 35c. and upwards, according to the distance carried. Corresponding reductions have also been made in the same manner for shipments weighing less than 7 lbs. The present order has no bearing whatever upon the shipments carried by one company only, but where two or more companies are involved in the transportation."

Among the Express Companies.

The Canadian Northern Ex. Co. has opened an office at Langruth, Man.

The Canadian Ex. Co. has recently opened offices at Nash's Creek, N.B., Black Capes, Chandler and Marcil, Que., and Iroquois Falls, Ont.

The Dominion Ex. Co. has recently opened offices at McKinnons Harbor and Westchester, N.S., O'Leary, P.E.I., Kent Jct. and Wapske, N.B., Percival, Primate and Prussia, Sask., Consort, Ensigne, Erimine, Keoma, Monitor and Veteran, Alta., Bear Creek, Cambie and Weyholme, B.C.

Press reports from the west state that despite the recent reduction in express rates, the companies operating there report that business is maintaining the average of former years. The volume of traffic to the east is stated to be rather less, but the traffic from the east showed some increases, while there was considerable increase in purely local business.

The Canadian Northern Ex. Co's. returns to the Interstate Commerce Commission for July 1913, show total receipts from operation, $86,256; express privileges $33,545; total operating revenue $52,711; total operating expenses $33,422; net operating revenue $19,289; taxes $464; operating income $18,824; mileage over steam lines 5,740; mileage over other lines 22.

The Canadian Ex. Co., in its report for July 1913, to the Interstate Commerce, shows total receipts from operation, $311,254; express privileges $141,779; total operating revenue $169,475; total operating expenses $148,582; net operating revenue $20,892; taxes $2,750; operating income $18,142; mileage over steam lines 6,250; mileage over other lines 830.

Telegraph, Telephone and Cable Matters.

The C.P.R. direct wire between Toronto and Winnipeg was put into service early in January.

The Great North Western Telegraph Co. has opened an office at Phillipsburg, Que., and has closed its offices at Lionshead, Lyn and Manotick, Ont., Pabos Mills, Price and Waterloo, Que.

In connection with the construction of the Quebec bridge, eight iron box telephone sets have been installed for use at various points as building proceeds. The instruments are placed on a traveller 200 ft. high, two of them being connected with a sectional unit switchboard, which is equipped for 20 lines to the shore. The six other instruments will be used at different points, a flexible cable and reel allowing the traveller to be moved without disturbing the connections.

The Montreal Telegraph Co.'s annual meeting was held at Montreal, Jan. 8. The company's property, which is valued at $2,151,823.85, is leased to the Great North Western Telegraph Co., and its operation and maintenance is guaranteed by the Western Union Telegraph Co., under an agreement for 97 years, from July 1, 1881, which also guarantees the payment of dividends of 8 per cent. During 1913, four quarterly dividends, aggregating $160,000, were paid, and in addition, a twelfth annual bonus of $5,000 was distributed with the last quarterly dividend, the amount having been derived from the investment of the company's contingent fund.

The Great North Western Telegraph Co.'s office at Hamilton, Ont., has been completely overhauled, rewired and re-equipped, making it on a par with the company's best offices. A large steel frame switch, with slate charging panel in one end, has been installed, together with new natural white oak operating tables throughout. The placing of a special steel protector rack takes care of the liability of damage through high tension crosses on outside lines, while a new storage battery furnishes power for the lines, the battery being charged by a motor generator. Great improvement in working conditions is to be expected from the new plant. The work was done under the supervision of C. E. Davies, Supervisor of Equipment, and H. K. Clark, Electrician.

Marconi Wireless Telegraph Company of Canada, Limited, Annual Report.

Following are extracts from the annual report for the year ended Jan. 31:—

Under the new contract with the Canadian Government for the operation of wireless telegraph stations on the Great Lakes, four stations have been established and placed in operation during the past year; one station is being enlarged, and three other stations are to be built during the current year. The negotiations with the Newfoundland Government were brought to a satisfactory termination in December by completing a contract which will continue the company's exclusive rights in Newfoundland until 1926.

Under the agreements with the Newfoundland and Canadian Governments the following stations are operated:—Ten stations for Newfoundland Government, the controlling station of which, at Fogo, is the company's property; 22 stations in Eastern Canada and Newfoundland for the Canadian Government, 4 of which are the company's property; 5 stations on the Great Lakes, on behalf of the Canadian Government.

The number of steamships now operated by the company on its own behalf is 44, and in addition 4 steamboats are operated on behalf of affiliated companies. As the old contracts for the equipment of steamships expire, they are being replaced, wherever possible, by new standard contracts, by means of which better conditions are secured to the company. The standard ship contract is for five years.

The Trans-Atlantic station at Glace Bay, N.S., has been operated by the company on its own behalf throughout the year, and towards the end of the year the construction of the duplex receiving station at Louisburg and the construction of the 6 wire pole line connecting that station with the transmitting station at Glace Bay were completed. The duplex system will be put into operation as soon as its corresponding station, now in course of construction at Clifden, Ireland, has been completed. A large sum has been invested in these undertakings, but it is confidently anticipated that the increased returns will not only fully warrant the expenditure, but will also assist in bringing much better returns on the total outlay at the Glace Bay station.

The traffic receipts for the year show a satisfactory increase in all departments. The ship and shore station receipts were $52,322, against $45,367 for the previous year. The Transatlantic traffic returns were $44,950, against $27,745 for previous year. There is an increase in the amount advanced by Marconi's Wireless Telegraph Co., Ltd., of London; this is more than counterbalanced by the increased assets in new stations and new plant.

Contracts for the sale of apparatus for the equipment of a large number of ship and shore stations are in hand for the current year, all of which will show a satisfactory profit. During the last session of Parliament the Canadian Government enacted a law making wireless equipment on passenger vessels plying in Canadian waters compulsory. This legislation, which becomes effective on Jan. 1, 1914, will result in further business for this company, owing to the necessity of equipping about fifteen additional steamers in Canadian territorial waters.

An important factor in the new business anticipated by this company during the coming year is the construction of two high power stations at Hudson Bay and Pas, Man., for intercommunication. This important contract was awarded to this company by the Department of Railways in connection with the construction of the new Hudson Bay Ry. by the government, and marks an important factor in wireless telegraphy, in the utilization of the Marconi system for covering wide distances over land. It is possible that further developments may ensue in this direction in the near future.

The following are the directors:—A. A. Allan, President; G. Marconi, Vice President; J. N. Greenshields, R. Bickerdike, G. C. Isaacs, G. M. Bosworth, W. D. Birchall, J. H. Lauer, General Manager.

Wireless Telegraph and Telephone Progress in 1913.

Because it is a young branch of electrical engineering, there is a great deal to be said annually about the progress of wireless telegraphy. Early in 1913 communication was established for the first time directly between Germany and the United States. Several new stations have been built or are building for transatlantic wireless service. During the fall wireless telegraphy gave another demonstration of its importance to navigation, when the s.s. Volturno, afire and fearing immediate destruction in a storm, summoned a rescue fleet by wireless telegraphy, which arrived in time to save a large part of the crew and passengers. To aid the mariner in finding his way across the ocean, wireless signals are sent out daily from the Eiffel Tower in France and from the Arlington station in the United States. A number of wireless stations have been established in Canada, on the Atlantic Coast, on the St. Lawrence River, on the Great Lakes, at Pas, Man., and at Port Nelson, Hudson Bay, and on the Pacific Coast. Wireless telegraphy is being used on trains to permit of communication with stations along the line. Wireless or induction train signal systems are being tried on some lines.

Considerable progress has also been shown in wireless telephony. Spoken messages were sent 600 miles from Rome to Tripoli. At this late date it seems remarkable that material progress should have been made in telegraph and cable systems. During the year a system has been devised which permits of sending the regular dot and dash signals over cable lines and relaying them automatically over land lines.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Standard Underground Cable of Canada, Ltd., Hamilton, Ont., has increased its authorized capital from $500,000 to $1,000,000.

Calendars for 1914 have been received from F. H. Hopkins & Co., Montreal, B. Greening Wire Co., Hamilton, Ont., the W. W. Butler Co., Ltd., Montreal, Flannery Bolt Co., Pittsburgh, Pa., the Hiram L. Piper Co., Ltd., Montreal.

The United States Light and Heating Co. has removed its New York City branch sales office from 30 Church St. to 210 West 50th St., which brings the New York United States Light and Heating Co.'s service station and sales office in the same building. The general offices remain at 30 Church St.

Independent Pneumatic Tool Co., Chicago, has issued circular W., describing and illustrating the different Thor roller bearing piston air drills, grinder, wood boring machines, single valve chipping hammer, one-piece riveting hammer, and two sizes of electric drills furnished with universal motors.

Gold Car Heating and Lighting Co.—Frank A. Purdy, heretofore Manager, Canadian Gold Car Heating and Lighting Co., Ltd., Montreal, has been appointed Sales Manager for Gold Car Heating and Lighting Co., and Canadian Gold Car Heating and Lighting Co., Ltd., with office at 17 Battery Place, New York, N.Y. He was born in New York, N.Y., Sept. 2, 1866, and started with the Gold Car Heating Co., July 1, 1905, as salesman. On Jan. 1, 1907, he was appointed Manager, Canadian Gold Car Heating and Lighting Co.

Canadian General Electric Co.—At a meeting of directors in Toronto, Dec. 27, to commemorate the 24th anniversary of the organization of a syndicate to enquire into the feasibility of establishing in Toronto, a system of incandescent lighting, which syndicate subsequently organized the C.G.E. Co., the President, Frederick Nicholls, made an address, in which he sketched the company's history. Of the eight original directors, six are still on the board, the other two having died. The syndicate started with a capital of $10,000. Now the company has assets of about $25,000,000, and a dividend has been earned and paid every year. During the 25 years, $6,286,744 has been paid in dividends, and a surplus equal to 40% of the paid up capital has been accumulated. Mr. Nicholls held that there is absolutely no "water" in the capitalization, every share, both common and preferred, have been sold for cash, at par or better, the average cash received by the company being $118 a share. The company has sufficient cash and current assets to pay off its whole indebtedness, also the entire issue of preferred stock, and still leave nearly $50 in net quick assets for every share of common stock, in addition to all the capital assets. The value of real estate, buildings and machinery is greatly in excess of the book values, and after deducting $1,000,000 reserved for depreciation, there remains $95 in capital assets for every share of common stock, so that the common stock represents a value of $140 a share. The company has no bond or mortgage indebtedness.

Transportation Conventions in 1914.

March 17-20.—American Railway Engineering Association, Chicago, Ill.
April 21.—American Association of Freight Agents, Houston, Tex.
May —.—American Railway Claim Agents, St. Paul, Minn.
May 18-22.—International Railway Fuel Association, Chicago, Ill.
May 19.—American Association of Demurrage Officers, St. Louis, Mo.
May 20-22.—Freight Claim Association, Galveston, Texas.
May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
May 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.
May 26-29.—Master Boiler Makers' Association, Philadelphia, Pa.
May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
June 10-12.—Master Car Builders' Association, Atlantic City, N.J.
June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 16.—Train Despatchers' Association of America, Jacksonville, Fla.
June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.
July.—International Railway General Foremen's Association, Chicago, Ill.
Aug. 18.—International Railroad Master Blacksmiths' Association.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly (acting), 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, J. S. Blanchet, Quebec.
Ship Masters' Association of Canada, Capt. E. Wells, 45 John St., Halifax, N.S.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

MAIL CONTRACT.

SEALED TENDERS, addressed to the Postmaster-General, will be received at Ottawa until Noon, on Friday, the 13th March, 1914, for the conveyance of His Majesty's Mails, on a proposed Contract for four years, six times per week each way, over Streetsville (via Huttonville and Churchville) Rural Mail Route from the Postmaster-General's pleasure.

Printed notices, containing further information as to conditions of proposed Contract, may be seen and blank forms of Tender may be obtained at the Post Offices of Streetsville, Huttonville, Churchville, and at the office of the Post Office Inspector, Toronto.

A. SUTHERLAND,
Post Office Inspector.

Post Office Inspector's Office,
Toronto, Jan. 23rd, 1914.

CANADIAN NORTHERN RAILWAY COMPANY.

NOTICE is hereby given that the Canadian Northern Railway Company will apply to the Parliament of Canada, at its next session, for an Act defining the manner of execution of the company's securities and the denominations of issue.

GERARD RUEL.

Toronto, 13th January, 1914.

CANADIAN NORTHERN MONTREAL TUNNEL AND TERMINAL COMPANY, LIMITED.

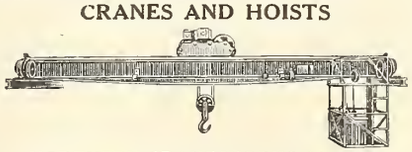
NOTICE is hereby given that the Canadian Northern Montreal Tunnel and Terminal Company, Limited, will apply to the Parliament of Canada, at its next session, for an Act authorizing the company to change its name.

GERARD RUEL,
Chief Solicitor.

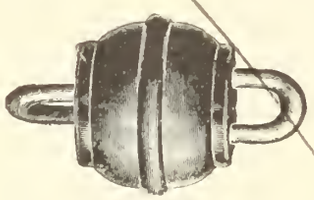
Toronto, December 31, 1913.

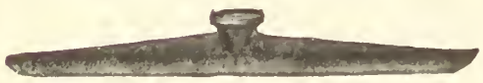
J. S. COFFIN, President — SAMUEL G. ALLEN, Vice-President — C. L. WINEY, Sec. & Treas.
FRANKLIN RAILWAY SUPPLY COMPANY
Specialists in Devices that Make for Economy
Main Office: 30 Church Street, New York
San Francisco Office: 795 Monadnock Bldg.
Chicago Office: 332 S. Michigan Avenue

POLES, PILING and TIES
Idaho and British Columbia
Cedar, Fir and Tamarack
MacKinnon Lumber Co., Ltd., Calgary

CRANES AND HOISTS

NORTHERN CRANE WORKS, Limited
Walkerville, Ontario

Car Closets
FLUSH OR DRY
DUNER CO. 101 S. CLINTON ST. CHICAGO





Line Construction Material for Electric Railways

After careful and thorough tests for quality and efficiency, covering a wide range of manufacturers, we can supply you with the highest grade of overhead line material.

Safety Strain Insulators

All metal parts of Northern Electric Safety Strain Insulators are made of drop-forged steel, and are completely insulated with Electrose Compound. The insulator here shown has a tensile strength of 7,000 lbs., and a dielectric strength of 12,000 volts.

Trolley Ears

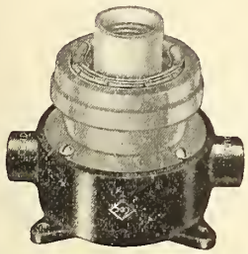
We can supply these in either clinch or solder type for round or grooved wire. We also have a complete line of mechanical screw clamps, which afford a great saving of time and labor.

Other specialties include all types of Hangers, Insulated Bolts, Section Insulators, Overhead Frogs and Crossovers, Pole Brackets and Pole Fittings, etc.

THE Northern Electric AND MANUFACTURING CO. LIMITED

MONTREAL	WINNIPEG	EDMONTON
HALIFAX	REGINA	VANCOUVER
TORONTO	CALGARY	VICTORIA

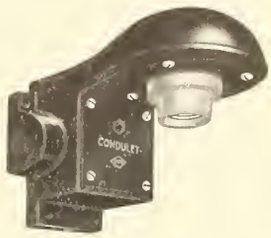
Railway Condulets



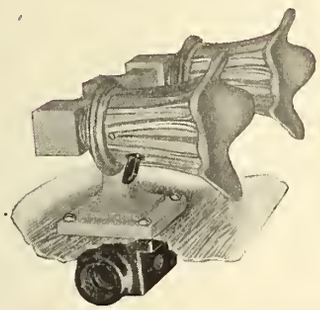
Type LOC
With Reflector Holder and Socket CRSEI.

Type DSOC
Takes Various Round Base Fittings.

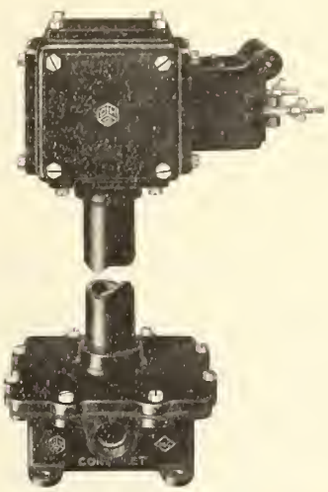
Type BLMC
Takes Various Round Base Fittings.



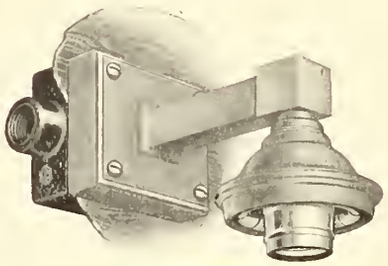
Type DSPA
With Receptacle and Receptacle Mounting Plate.



Type KRY
With one of Various Fittings it will Take.



Single Outlet Yard Charging Condulet for Underground Conduit System—Type UGC Condulet used as Base.



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With one of Various Fittings it will Take.

Type JRRH Hood
For use on Type KRY with Round Base Fittings.

Type BRHS
With 100 Ampere Receptable and Plug-Battery Charging Equipment for Cars.

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Nuttall Sleet Wheels and Scraper.

6-inch Sleet Wheel.

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will prepare you to meet the sleet storms that are coming. When your road is equipped with them you need not worry any more about sleet storms and their bad tie-ups.

The Nuttall Sleet Wheel

takes the place of the ordinary wheel in sleety weather.

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scrapes the sleet off the trolley wire, and can be slipped on at a moment's notice.

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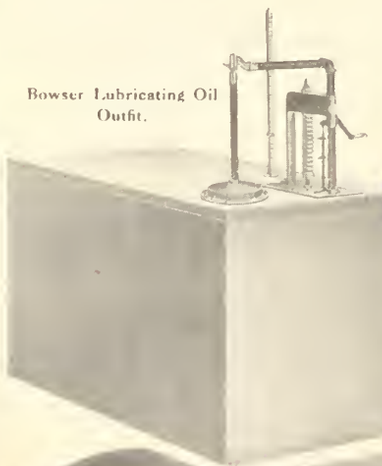

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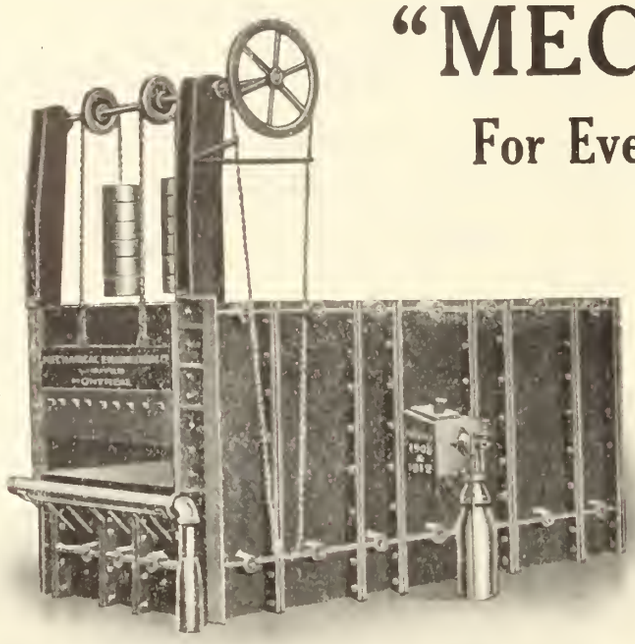

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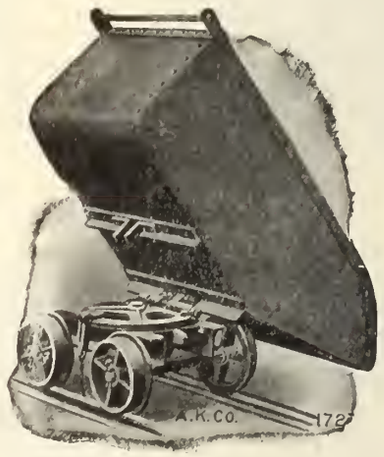

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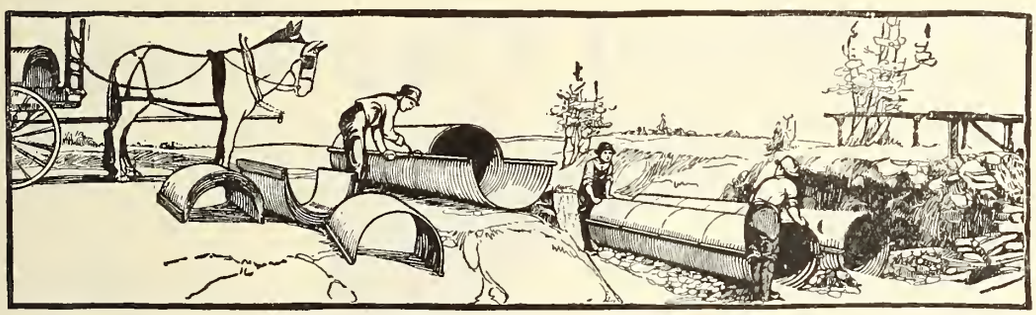

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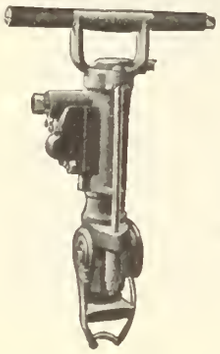

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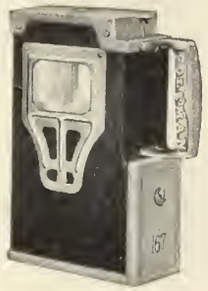

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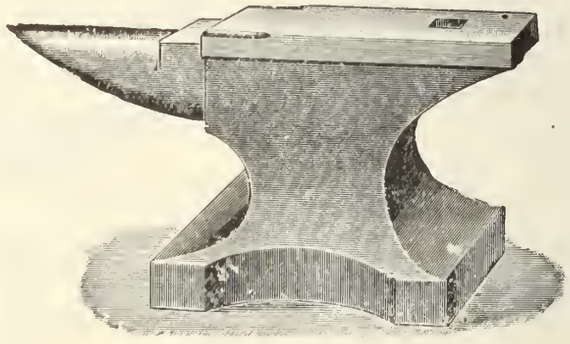

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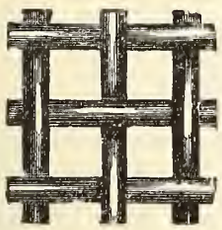

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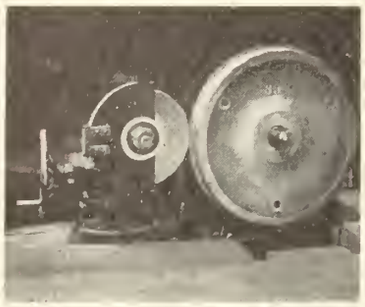

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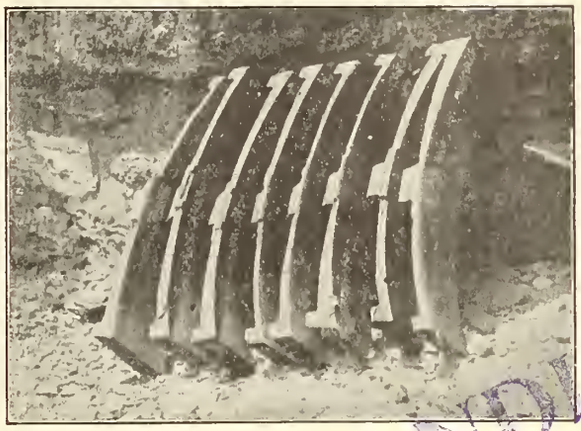

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You get your full money's worth in satisfactory service from them always.
Steel Back Car, Coach and Driver Shoes are absolutely essential for safe and economical operation in heavy and high-speed service.

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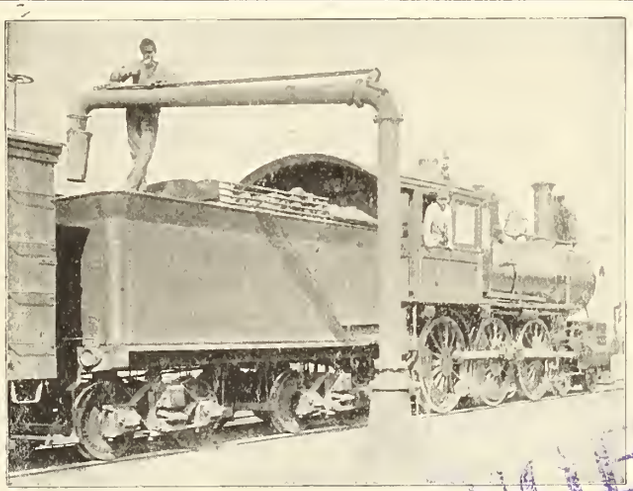

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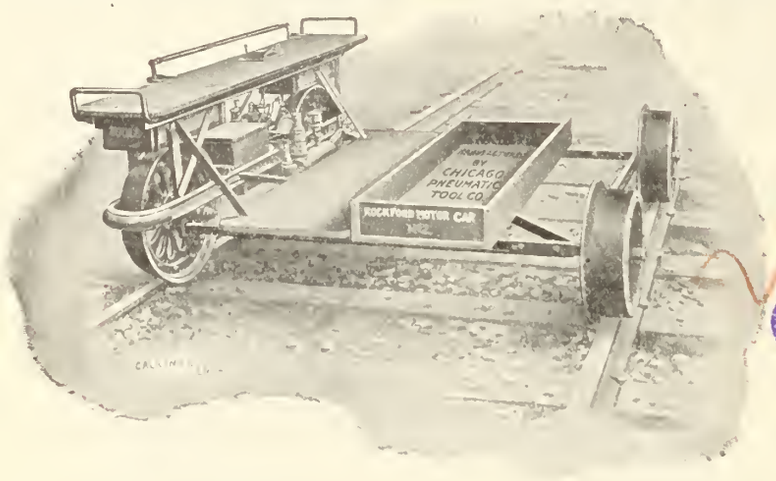

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STREET RAILWAY SPRINGS, from the largest to the smallest.
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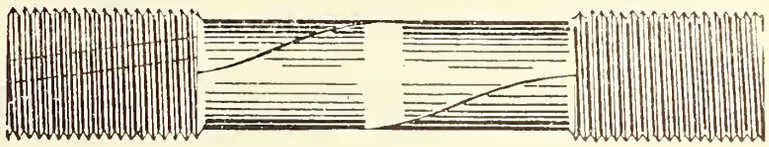
American Flexible Staybolts

Manufactured in Montreal



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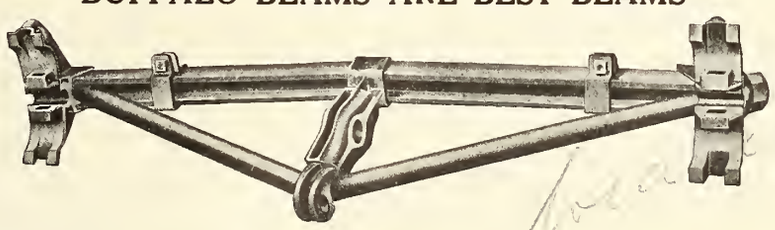

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AND ITS LESSON

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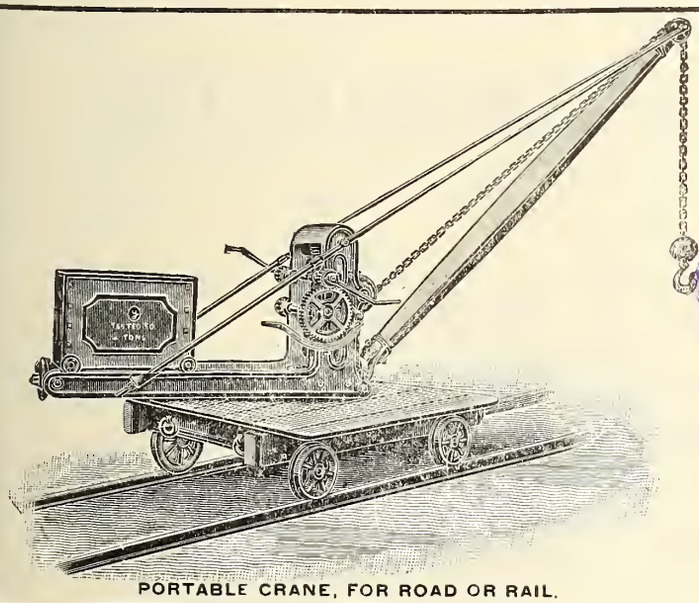

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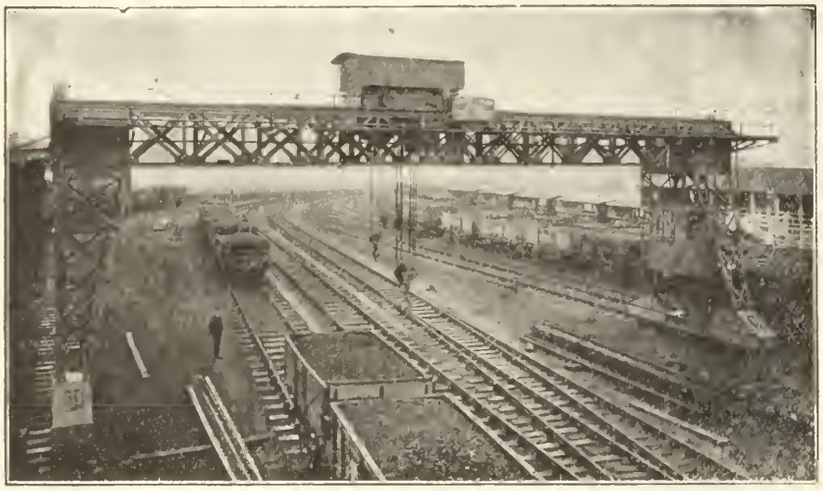

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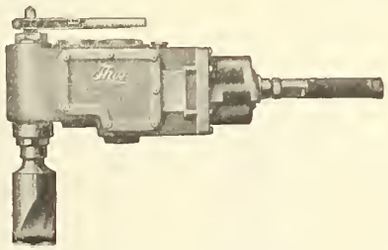

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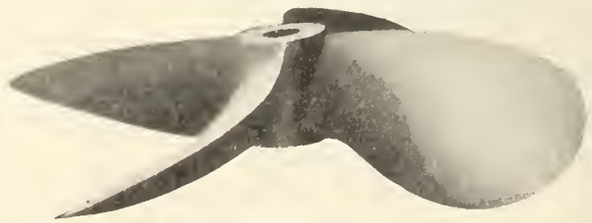

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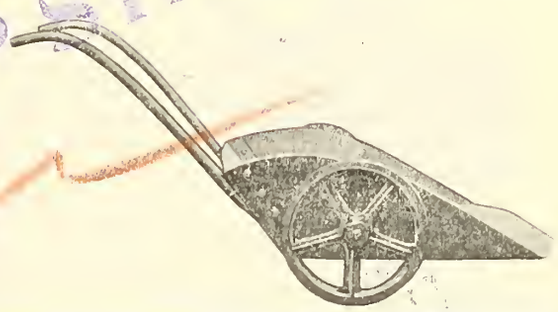

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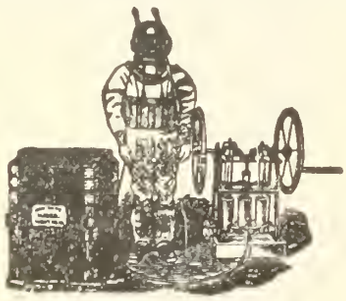

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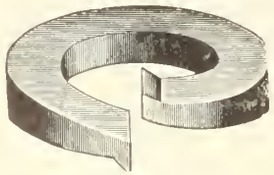

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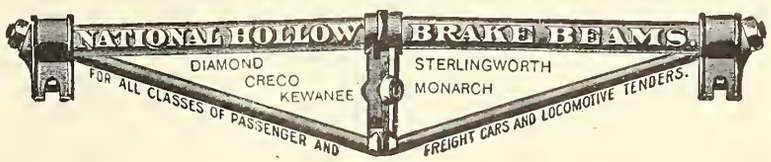

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Carborundum Co.
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Canadian Car & Foundry Co.
Nova Scotia Car Works, Ltd.
Jas. W. Pyke & Co.
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Steel Co. of Canada, Ltd.
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Youngs.
WINDMILLS
Ontario Wind Engine & Pump Co.
WIRE
Titanium Alloy Mfg. Co.
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E. F. Phillips Electrical Works.
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Steel Co. of Canada, Ltd.
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B. Greening Wire Co., Ltd.
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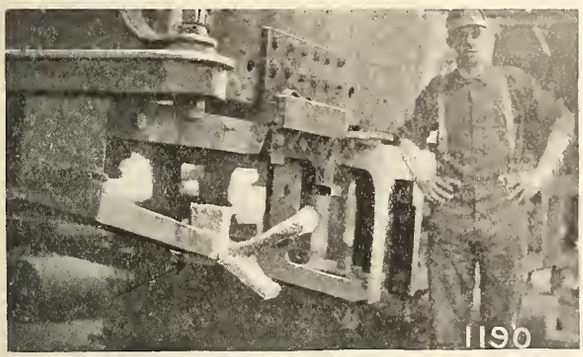
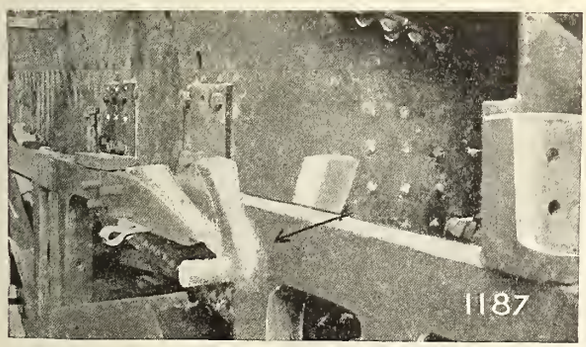
YACHTS
Polson Iron Works, Ltd.



Finished Thermit Weld on Engine No. 802 of the Grand Trunk Pacific, Transcona, Man.



Frame Welded with Thermit by the Illinois Central, Centralia, Ill

Thermit Welding Will Save You from $25 to $250 on Every Frame Weld

Scarcely any dismantling is required where locomotive frames are welded with Thermit, as it is only necessary to provide room for the mold box around the parts to be welded together. It is common practice to complete a locomotive frame weld and return the engine to service in twelve hours or less.

The mechanical officials of 419 railroad shops in the United States, Canada and Mexico are using Thermit regularly and taking advantage of the very large saving which the Thermit process makes possible.

The initial cost of installing materials is so small that the saving on just one job is usually sufficient to cover it. Full information regarding the process will be found in our pamphlet 2144, which will be sent promptly on request.

GOLDSCHMIDT THERMIT COMPANY

WILLIAM C. CUNTZ, Gen. Mgr.
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329-333 Folsom Street, San Francisco
90 West Street, New York
7300 South Chicago Avenue, Chicago

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On construction work you should use a machine that will be busy all the time, because an idle machine means a loss in money.

THE BROWNHOIST LOCOMOTIVE CRANE

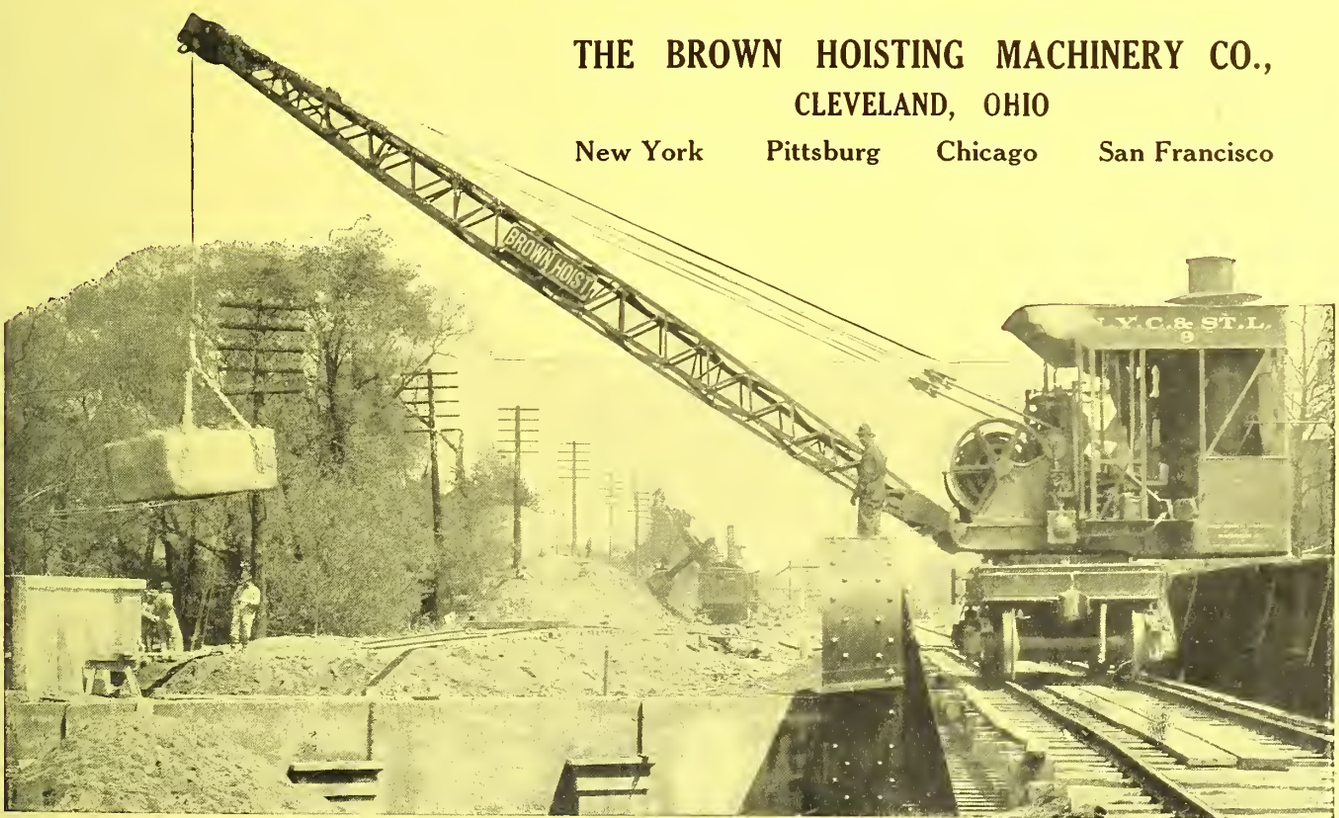
Can be kept busy all the time from the beginning to the end on any construction work—because it can be used for excavating with grab or drag-line bucket; handling sand, gravel, stone, etc., with grab bucket or skips; drive piling and sheeting with either steam pile-driver or drop-hammer; place the concrete in elevated forms or in trenches; pull piling and sheeting; place the backfill; switch the cars; and all the miscellaneous hoisting work.

CHANGE

These Cranes are self-propelled; made in various capacities; eight and four-wheel; and with either steam, electric, or gas engine drive.

Our Catalogs I and K show how and where the Crane is used. Write for these Catalogs.

THE BROWN HOISTING MACHINERY CO.,
CLEVELAND, OHIO
New York Pittsburg Chicago San Francisco



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Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 193 — TORONTO, CANADA, MARCH, 1914 — Subscription Rates Page 125

Imperial Wire & Cable Company, Limited

Electrical Wire and Cables for all Purposes—Paper and Rubber Insulated Lead Covered Cables; Rubber Covered Wire; Weatherproof Wire; Flexible Lamp Cord; Bare Copper Wire, Etc.

Branch Offices are situated at Toronto and Winnipeg—Write to nearest point for information and prices.

Alberta and British Columbia enquiries will be handled through our Sales Agents, The Northern Electric & Manufacturing Co., Limited, at Calgary and Vancouver

GENERAL RAILWAY SIGNAL CO. OF CANADA, LIMITED

GENERAL OFFICE AND WORKS, : LACHINE, P. Q.

Makers of Standard Appliances as Approved by Railway Signal Association and Board of Railway Commissioners.

ENAMELED IRON SIGNS

For Steam and Electric Railways, Express, Telegraph and other purposes.

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NON-CORROSIVE MALLEABLE TIE PLATES AND RAIL BRACES

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Electric Cars, Fine Carriages, Wagons, Sleighs, Etc.

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DUNDAS ONTARIO

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Manufacturers of "Cleveland" Pneumatic Tools and "Cleveland" Rock Drills.

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THE WHYTE RAILWAY SIGNAL CO. LIMITED

Foundry and Office: 1882-90 Davenport Rd. TORONTO

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of all descriptions to stock or special design, apply to

The Canadian Office and School Furniture Co., Limited

Preston Ontario

Ventilation--Sanitation--Economy--Safety

All Combined in

THE COOPER FORCED VENTILATION HOT AIR HEATER

(PATENTED)

Ask for the full story.

We Also Manufacture Pressed Steel Hot Water Heaters

THE COOPER HEATER CO., CARLISLE, PA.

THE PRESTON Car & Coach Co. Limited

PRESTON, ONT.

Manufacturers of

Steam and Electric Railway Cars and Special Cars

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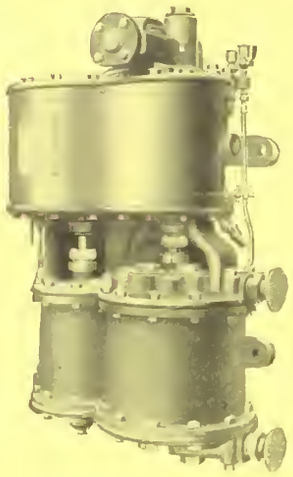
Westinghouse Air Compressors

Every steam-shovel should have an air-compressor outfit.



Westinghouse Cross Compound Compressor.

Steam Shovel equipped with Westinghouse Cross Compound Compressor.

WESTINGHOUSE Steam-driven Compressors are of such a size and design that they may be installed on the shovel structure. They require little attention, are simple and withstand the roughest handling.

Large numbers of Westinghouse steam driven air-compressors are now in use in construction work of all kinds. They are usually attached to a hoisting engine boiler, but are just as easily attached to a column, post or any substantial support.

Westinghouse steam driven compressors are made in both simple and compound types.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX	WINNIPEG	CALGARY	VANCOUVER
Traders Bank Building	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.	158 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

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Where QUALITY counts in

WIRES AND CABLES

BARE and INSULATED WIRES, RAILWAY and POWER FEEDER CABLES in Copper or Aluminum. COPPER TROLLEY WIRE COPPER CLAD WIRE (Duplex Metals) GALVANIZED STEEL STRAND GUY WIRE.

Stocks of wire and cables carried at Toronto, Montreal, Winnipeg and Vancouver.

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Macdonald, Marpole Co., Limited
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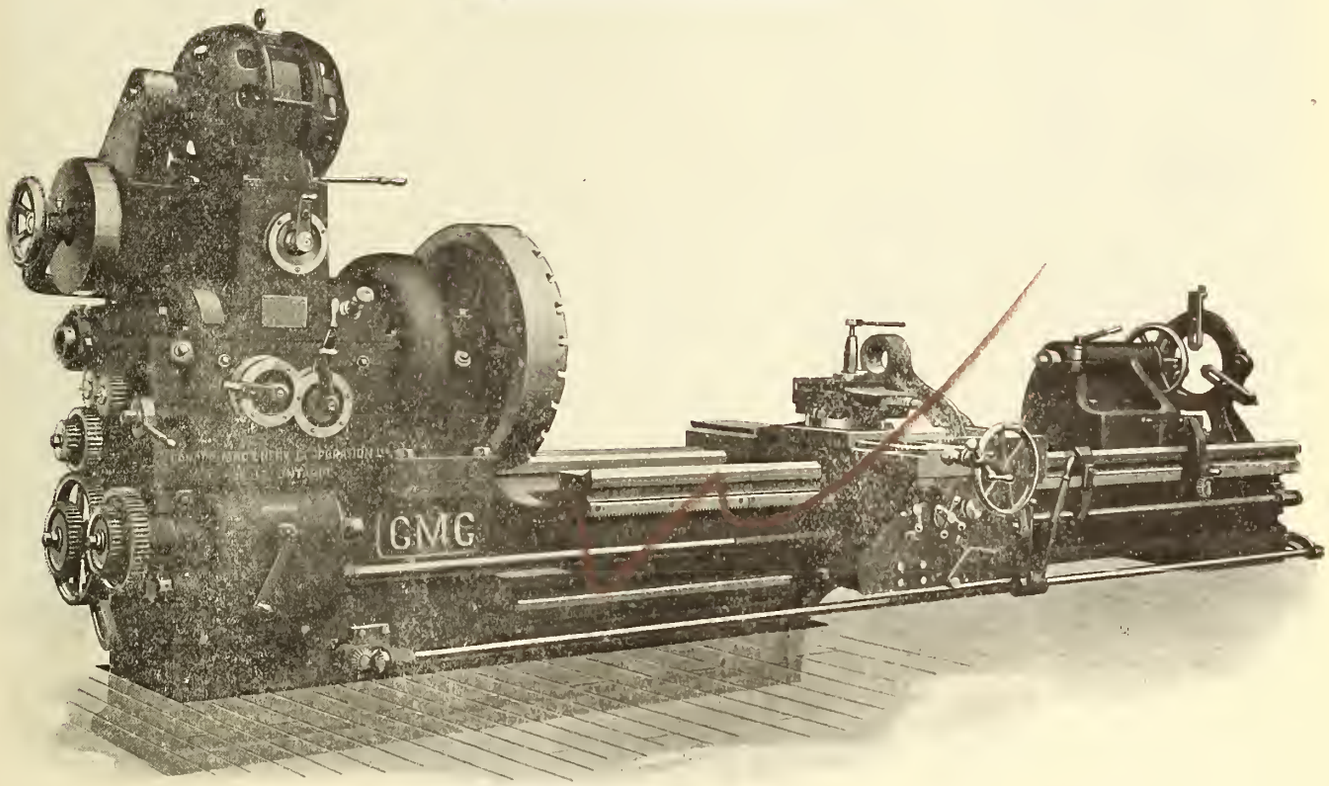
CANADA WIRE & CABLE CO., LIMITED — CANADA — TORONTO CANADA

TRIPLE GEARED C.M.C. GAP LATHE



36" x 60" x 18' All Geared Motor Driven Gap Lathe

The design of the head illustrated is our standard for gap lathes of 36" swing and larger.

The simplicity of design of the head is shown by 27 spindle speeds (9 through face plate drive), being obtained by only 16 gears.

The clutch control handle for starting and stopping the machine is conveniently carried on the apron.

The sliding drive gears are of special heat treated chrome nickel steel and are all carefully rounded to facilitate meshing.

Photographs and specifications sent on request.

Representatives:—

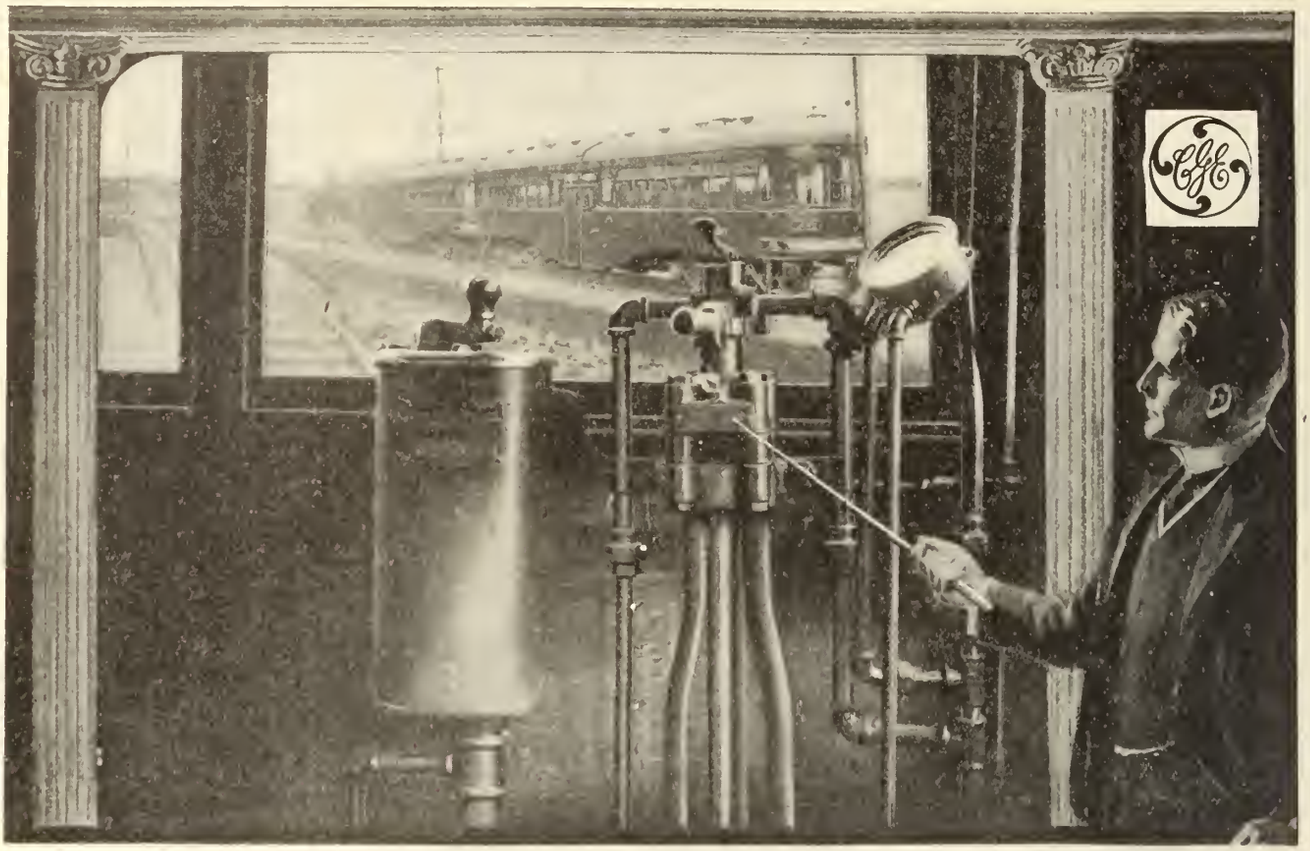
QUEBEC:
Williams & Wilson, Limited
Montreal

MANITOBA:
The A. R. Williams Machinery Co., Ltd,
Winnipeg

Canada Machinery Corporation, Ltd.

GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.



For Interurban Railways

there is no system which has the adaptability and all round reliability inherent in the combination of **SPRAGUE C-G-E TYPE MK CONTROL** and the **COMBINED STRAIGHT AND AUTOMATIC AIR BRAKE SYSTEM.**

The straight air system will give you dependable service and the MK control—electrically operated—affords maximum reliability under all conditions.

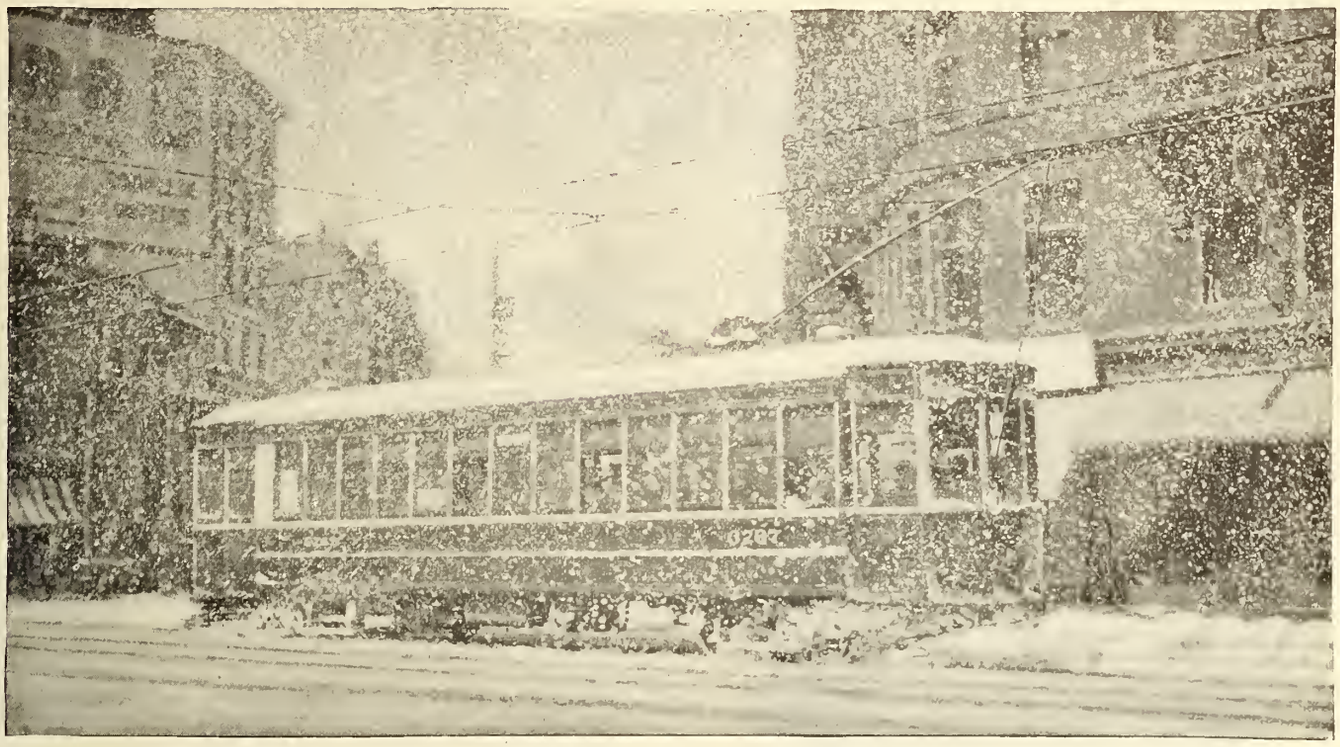
When multiple unit trains are operated, the straight and automatic air brake feature will give **maximum protection and adaptability**—and the MK Control will insure the **service reliability** and **low maintenance** which have characterized the "all electric" method of operation during twelve years in the heaviest service known to the railway field.

CANADIAN GENERAL ELECTRIC COMPANY,

LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



Insure Your Overhead Construction

Rain, sleet and snow cannot affect C-G-E Sherardized Line Material. Every iron and steel part is thoroughly weather-proofed by the improved C-G-E process which constitutes the best insurance against rust and consequent breakage.

C-G-E Sherardizing not only gives a coating of zinc to the surface of the metal, but causes this coating to form, with the iron, an alloy extending considerably below the surface and becoming an integral part of the whole. Thus scaling is impossible even under the most severe and prolonged service.

C-G-E Sherardizing also furnishes efficient protection to threaded parts without materially altering their dimensions. It is also free from the weakening effect sometimes caused by hot galvanizing on malleable iron.

C-G-E Sherardizing successfully withstands the Preece test of successive immersions in copper sulphate solution and has proved its absolute reliability under prolonged exposure to salt spray.

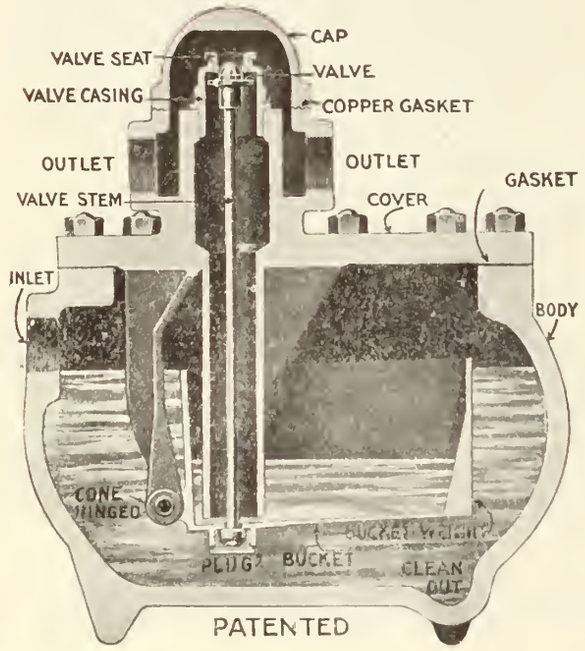
All C-G-E Line Material is Sherardized—a positive insurance against Winter's storms.

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

POWER PLANT EQUIPMENT



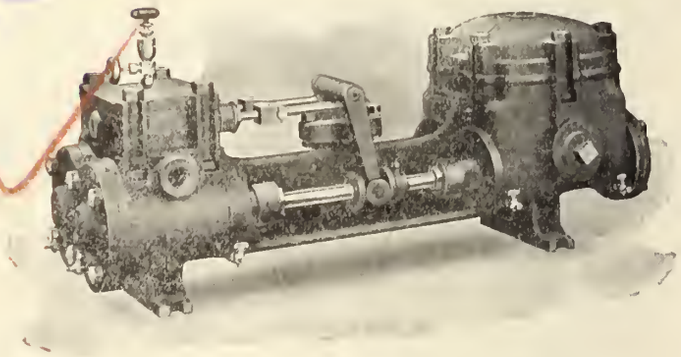
THE SQUIRES TRAP

The Squires Steam Traps will discharge the condensation to any height corresponding with the steam pressure; one pound being necessary for each twenty-seven inches of lift desired. They are also suitable to remove the water of condensation from a vacuum system of heating when equipped with our vacuum attachments.

As soon as sufficient water enters the trap, the bucket, being buoyant, rises and closes the valve which is attached to it by a brass rod. When the condensation in the trap body has reached the high water line the bucket fills and sinks. The pressure at the trap then discharges the water in the bucket together with the condensation in the trap body through the valve port to the outlet until it has reached the low water line.

BOILER FEED PUMPS

Our Duplex Steam Boiler Feed Pumps have been designed with the idea of making them more compact and accessible than any pumps hitherto offered for this service. They can be furnished in sizes up to 2,000 U. S. gallons per minute against a working pressure of 150 lbs. per square inch, with a steam pressure of approximately 100 lbs. per square inch.



CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of:—Air Compressors, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Turbines, Structural Steel Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

HEAD OFFICES, TORONTO. District Sales Offices, Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

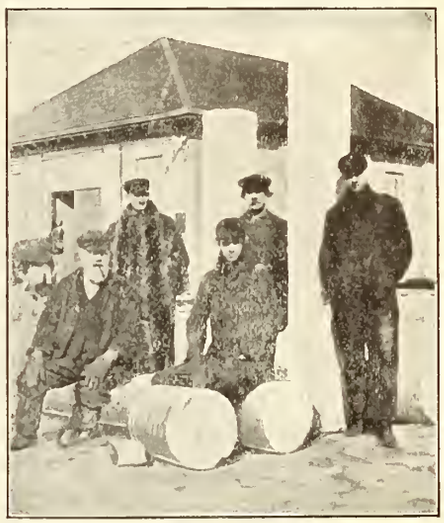
CONTRACTORS' EQUIPMENT

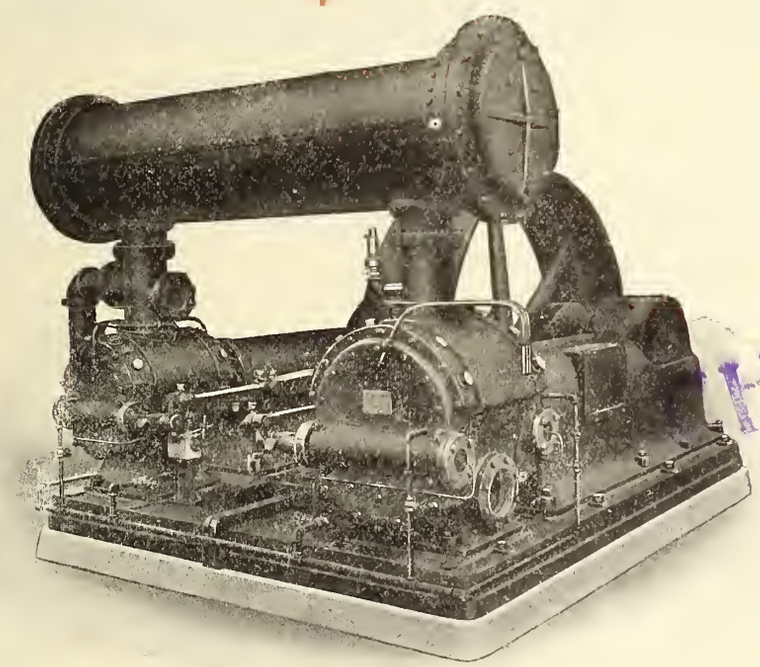
McKIERNAN-TERRY
CORE DRILLS

In connection with the construction of new steam or electric railways, or with the development and extension of older properties, the McKiernan-Terry Core Drill has been found of remarkable utility. It is used for test borings, either for the purpose of road-bed construction or for determining the position of anchorages and piers for bridges.

The McKiernan-Terry Core Drill is employed in both dimension stone and crushed stone quarrying. In both businesses it is used for ascertaining the depth and quality of the stone, but in the latter it is also employed for blasting out large quantities of rock at one time.

The 16-inch hard limestone cores here shown were taken out by one of our class "C" McKiernan-Terry Core Drills, operated by the corporation of Winnipeg.





BLAISDELL
AIR COMPRESSORS

Durability and reliability, next to efficiency, are conceded to be of first importance in machinery of this character when used for any purpose. It should be noticed that in the design of the BLAISDELL Compressors all principal bearing surfaces are provided with a flood lubrication, thus insuring freedom from trouble and resulting in absolute reliability of service.

These points will especially appeal to those running power plants in which continuous service is an absolute essential, and to those to whom in most cases, a breakdown would involve serious delay and loss.

CANADIAN ALLIS-CHALMERS,
LIMITED

Manufacturers of Air Compressors, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

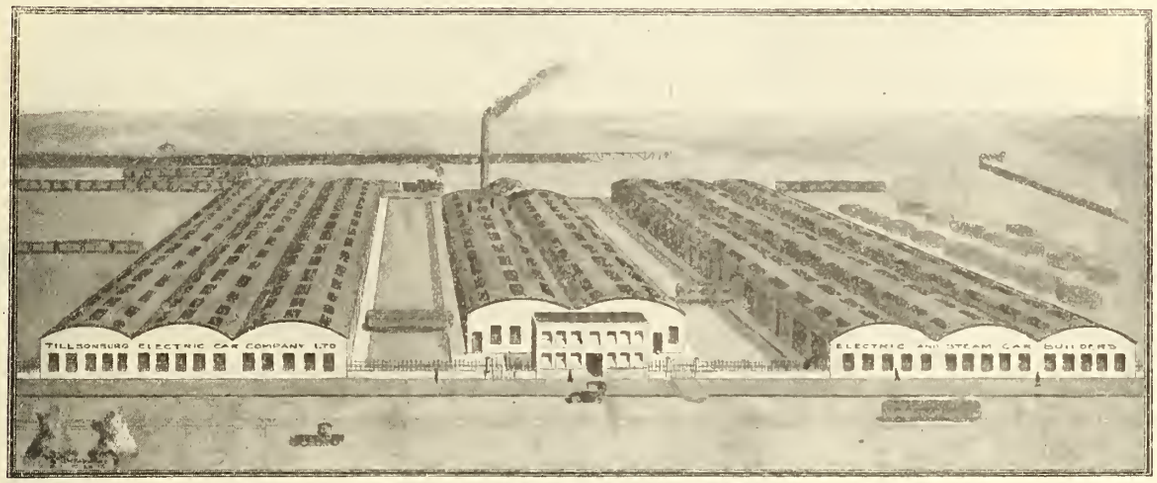
Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

Dependable Deliveries on Electric Cars



We have already built Freight and Express Cars and now have under construction Interurban Cars.

The plant is capable of catering to your most exacting requirements, and the process of manufacture and methods of workmanship are open for inspection to all electric railway officials.

We are at all times ready to give your specifications and deliveries our best attention.

THE TILLSONBURG ELECTRIC CAR COMPANY, LTD.

Office and Works, Tillsonburg, Ont.

THE
Steel Company of Canada
LIMITED

Railroad Track Equipment
Angle Bars Tie Plates
Steel Track Spikes Bolts & Nuts

PIG IRON
Foundry Basic Malleable

Car Axles and Forgings
Invincible Fencing
Bar Iron Bar Steel

Arm Braces Wood and Machine Screws
Copper Trolley Wire, Telephone and Galvanized Wire
Nails Tacks Wrought Pipe

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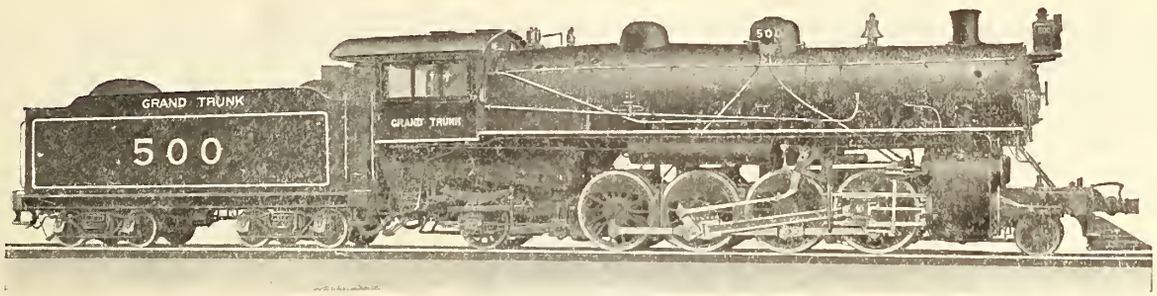
J. B. H. Rickaby, Victoria, B.C.
H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

INCREASED TRAIN LOADS

MIKADOS VS. CONSOLIDATIONS



Total Weight of Engine, 283,000 pounds; Weight on Drivers, 213,500 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 175 pounds; Cylinders, 27 x 30 inches; Maximum Tractive Power, 51,700 pounds.

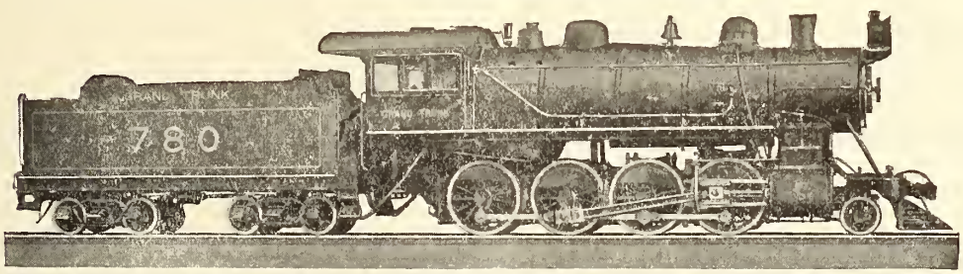
The substitution of Mikado locomotives for Consolidations on the Grand Trunk Railway System has enabled that road to greatly increase train loads and to properly provide for the growth of freight traffic.

This is shown by the following ratings that have recently been put into effect on the Western division:

	Miles	Helper Service	Consolidation	Mikado	Increase
Port Huron to Nichols	156½	None	2000	2800	40%
Nichols to Elsdon	168½	None	1700	2500	47%
Elsdon to Nichols	168½	For 5 miles	2000	2800	40%
Nichols to Port Huron	156½	None	2000	2800	40%

The Western division is made up of broken grades not exceeding 0.6 per cent., except a 5 mile 0.95 per cent. grade from Sedley to Valparaiso, where a helper is required.

Fifty additional Mikado locomotives are now being delivered by this company to the Grand Trunk Railway System.



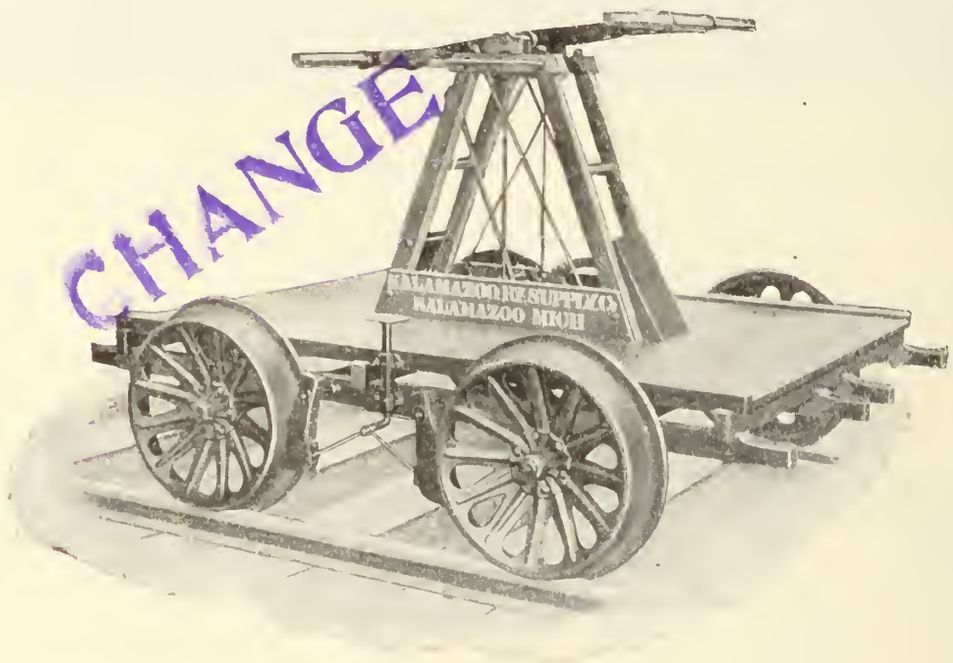
Total Weight of Engine, 212,000 pounds; Weight on Drivers, 186,000 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 210 pounds; Cylinders, 22½ and 35 x 32 inches; Maximum Tractive Power, 34,400 pounds.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

HAND-CARS

PUSH CARS, TRACK LAYING CARS, INSPECTION CARS,
VELOCIPEDES—MUDGE-ADAMS MOTOR CARS



Kalamazoo Cars are all fitted with improved pressed-steel wheels which give from 50 to 100 per cent. greater service than any wheel of similar weight or design on the market.

FULL LINE OF RAILROAD APPLIANCES CARRIED IN STOCK.

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MONTREAL	TORONTO	COBALT	WINNIPEG	CALGARY
318 St. James St.	155 West Richmond St.	Opp. Right of Way Mine	259-261 Stanley St.	10th Ave. and 3rd St. East

VANCOUVER	QUEBEC	ST. JOHN, N.B.	HALIFAX
101 Water St.	31 St. Louis St.	57 Smythe St.	78 Granville St.

1914
RAIL ORDERS

Before placing yours consider the following facts—clearly proven in our Rail Reports—Bulletins 1, 2 and 3.

1st—Titanium-Treated Open Hearth Rails wear better than Standard Open Hearth—Because they are cleaner.

2nd—Titanium-Treated Open Hearth Rails have greater endurance than Standard Open Hearth—Because they are free from excessive Segregation and Slag inclusions and are therefore more uniform.

3rd—To get the maximum benefit from Titanium-Treatment our "Ferro Carbon-Titanium Specification for Rails" should be written in your contracts and our men should be authorized to supervise the use of our product.

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Operating Under Rossi Patents. Process and Products Patented.

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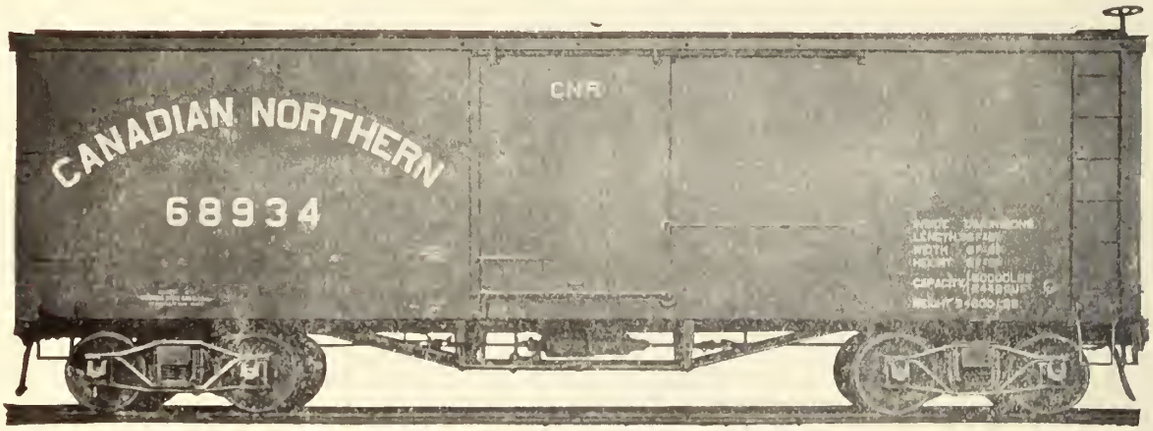
Pittsburgh Office: Oliver Building **Chicago Office: Peoples Gas Building**

AGENTS:

The Primos Chemical Co., Primos, Delaware Co., Pa. Pacific Coast: Eccles & Smith Co., Los Angeles, Portland, San Francisco

GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Ltd., Sheffield, England

T. H. & B. Ry. 50 Ton, All Steel, Hopper Bottom, Coal Car



C. N. R. 30 Ton All Wood Box Car

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The operating organization of this company is composed of men who have had international experience in the construction of railway rolling stock. The plant is equipped to build freight, passenger and electric car equipment of all classes, and is in a position to give prompt delivery.

Manufacturers in Canada of Damascus Brake Beams and Brascott Ladders

National Steel Car Company, Limited

Montreal Office
Shaughnessy Bldg.

Western Union Code
Cable Address "Nasteel"

Works and Operating Offices
Hamilton, Ont.

Here's Exactly Why Engineers Recommend

Scherzer ROLLING Lift Bridges

"Used All Over The World"

Designed on the Universal Rolling Principle

200 Scherzer Rolling Lift Bridges now in successful use in the

United States, Canada, England, Ireland, Wales, France, Holland, Belgium and other countries.

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Notice the simple, rigid, riveted one-piece movable bridge. Extraordinary simplicity and rigidity—greatest efficiency at less cost.

Some Reasons Why The Scherzer Rolling Lift Bridges Are Recommended by Engineers the World Over—

It is a riveted complete rigid structure.

Truss has no pin connections.

Very little machinery in structure—about 5 per cent. of total metal. (Machinery costs about three times as much per lb. as structural steel.)

Over 50 per cent. less MACHINERY than a design with trunnions.

So perfectly balanced as to require little power to operate.

Cost of maintenance low.

Raised and lowered without shock.

Less metal than other designs.

Gives maximum clearance of waterway without fender piles.

Machinery or truss not exposed to damage by boat lurching to side.

Concentrated loading at any point not as great as on a trunnion.

Counterweight is fixed. Height of counterweight not much over ordinary truss.

No high towers.

All parts easy of access.

No costly trunnions or heavy castings liable to be displaced.

No uplift to overcome before bridge commences to rise.

Requires shorter piers than a trunnion.

Trusses roll in direct line of standard distance c. to c. of ordinary trusses.

Grade of railway or bridge could be raised in a simple manner.

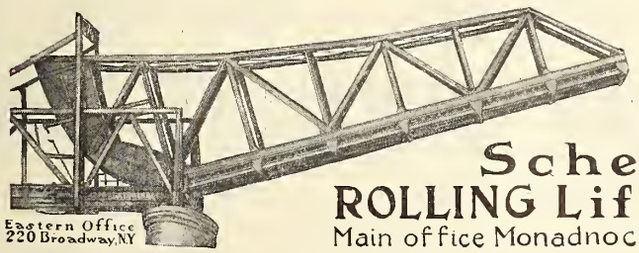
Scherzer ROLLING Lift Bridges cost less to install, operate and maintain—because they are simple, rigid, riveted structures with less metal than any other movable bridge and far less machinery. They are balanced in all positions, minimizing motor power. Their base is rounded just enough to let them roll forward and down, closing them; or roll back and up, opening them. This forward and back motion saves large amounts in material, weight and motive power, as a much shorter span can be used. When open, the bridge is back, away from the channel, preventing accidents from moving boats.

No friction-causing axles, journals or trunnions are used to carry the bridge. There is nothing to lubricate but the small motor and very simple machinery. The curved base rolls on level tracks, using the simple principle of track and wheel used by all railroads. The foundations naturally cost less because the bridge weighs less. No wharfage is needed on either side. New bridges can be added beside the old ones, avoiding wasteful replacement.

A Scherzer ROLLING Lift Bridge can be opened or closed in thirty seconds, a vast saving in time for land and water traffic. Tracks are fastened permanently to the bridge, doing away with rail lifts or end lifts, and preventing accidents. When open, these bridges are barriers against accidents and signal distant traffic to stop.

The Foundations Cost Less Because the Superstructure Is So Simple and Weighs Less.

Send for sketches, estimates and full information, showing how Scherzer ROLLING Lift Bridges are adapted for the widest channels, with particulars of demonstrated efficiency and economy.



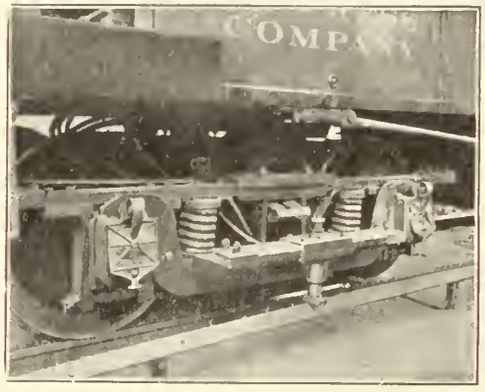
Eastern Office 220 Broadway, NY

Scherzer ROLLING Lift Bridge Co.

Main office Monadnock Block Chicago, U.S.A.

Cable Address Scherzer Chicago

The Maintenance Record On Roads Using the Simmen System



is showing clearly that this System is largely eliminating the chief stumbling block in the way of universal use of automatic block signals.

The reasons for this are obvious.

There is nothing in these installations requiring any additional employment of labor for inspection.

The overhead is in accordance with standard telephone construction and is easily kept under inspection by the regular force of linemen.

The simple Cab Signal equipment on the cars (contact shoe—relay—battery—lamps) is inspected and cared for by the regular barn and shop inspectors.

Dispatcher's table, record sheet and batteries, are in the dispatcher's office and are easily cared for by the dispatcher with the occasional help of a lineman.

And that is all there is to it.

There is no intricate track mechanism—there is no mechanism of any kind, anywhere in the Simmen System, which requires special inspection or repair organization.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

This
Trade Mark
on High Voltage
Porcelain Insulators
and Fittings
Insures —

Reliability
in service
as a direct result
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Quality
First!

Extensive additions to our
Pottery now make possible
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ESTABLISHED IN 1888

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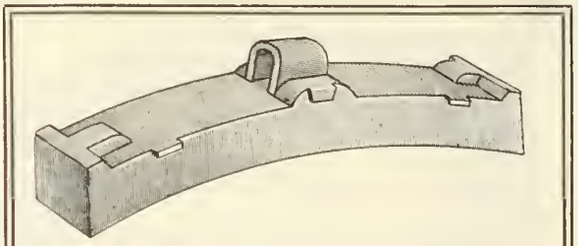
Our Improved Reinforced

BRAKESHOES

For All Classes of Steam and Electric Cars.



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Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

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We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.

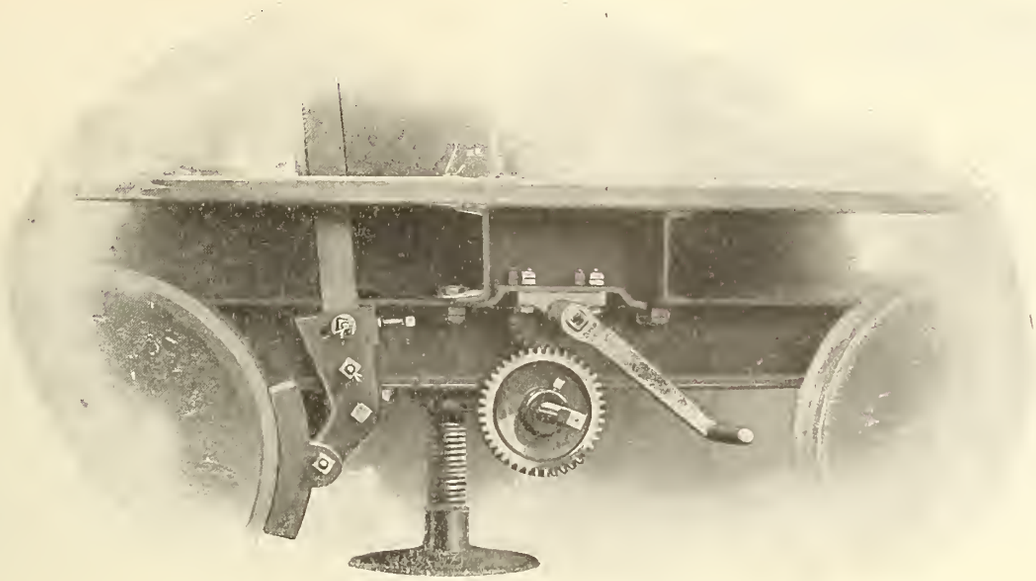
25-ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

Sherbrooke, Que.



Perfect Bonding

without interference with traffic. The cut shows the pivotal jack used in removing the bonding car from the track. By this means the car can be quickly and easily removed from the track to allow cars to pass.

Electric Weld Rail Bond terminals are guaranteed against deterioration. The bond shapes are right to give longest life to the bond.

Write for Full Details.

The Electric Railway Improvement Co.

Cleveland, Ohio

Canadian Government Railways

Intercolonial Railway

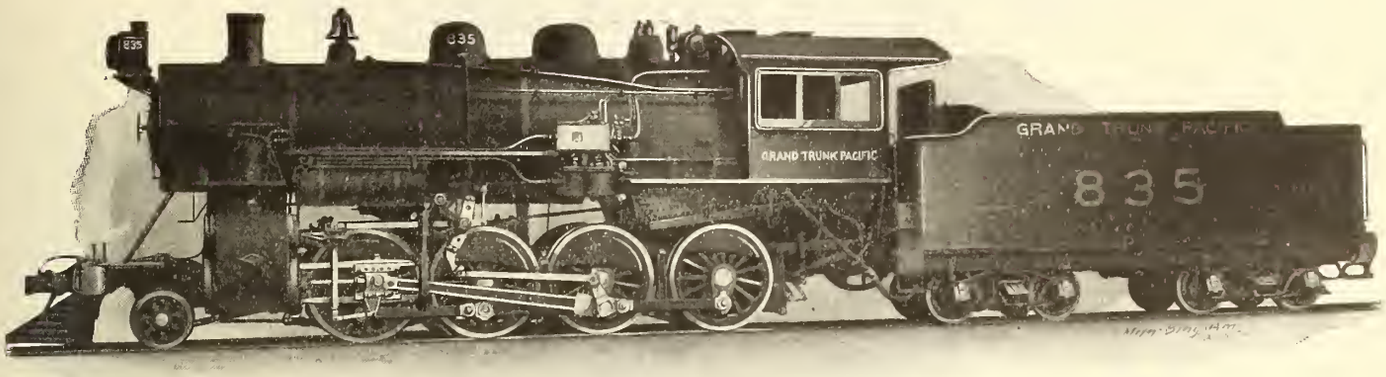
Prince Edward Island Railway

The Intercolonial is the only all-Canadian trunk line from Montreal to the Atlantic Sea-board. The Maritime Express, daily except Saturday, leaves Bonaventure Union Depot, Montreal, for Halifax, making connections for St. John, the Sydneys, Prince Edward Island and Newfoundland, and is noted for excellence of sleeping and dining car service. The local passenger service on the Canadian Government Lines, in proportion to the population served, is not equalled in America.

The operation of fast through freights, frequency of local and special freights, and the attention given to patrons of the railway, give every satisfaction to freight shippers.

Canadian Locomotives

for contractors, industrial works, railroads, etc.



CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 16 tons. Weight of tender in working order 150,000 lbs.

All locomotives are equipped complete with fittings, fixtures, tools and all appliances necessary for their operation.

If desired, we will furnish with all tenders on standard locomotives, complete detailed specifications, fully describing all construction features, with the various sizes of dimensions noted. Specifications can also be accompanied by photographs showing the type of locomotive proposed, with any modifications clearly mentioned.

We have had a half century's experience which may be useful to intending purchasers in selecting locomotives suitable for peculiar conditions, or where roads are not fully completed or surveyed.

Our plant is now being greatly enlarged. New equipment has been installed and the capacity of the works brought up to an output of about eighteen locomotives a month, which will soon be increased to twenty-five a month. Consult us before purchasing a locomotive!

Canadian Locomotive Company, Limited

Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

EDISON BSCO

PRIMARY BATTERY

FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

EDISON-BSCO
Type 452 Cell,
450 Ampere Hours
Capacity.

In connection with the use of EDISON-BSCO Cells on track circuits, a prominent Signal Engineer writes:

"Concerning the test of EDISON-BSCO three-cell battery outfit in track circuit at ————, our Supervisor reports that this battery was set up on April 5th, and that it was renewed on December 4th, which is eight months lacking one day. During that period the service was satisfactory and nothing was required in the way of attendance."

Since the cost of active material is approximately the same for Edison or gravity cells, and the Edison cells will feed a track circuit eight months without attention, it is quite evident that on a division or an entire road equipped with Edison Cells, the saving is considerable on account of the frequent expense incident to renewal or cleaning of the gravity cells being eliminated. For this reason, together with the fact that it is desirable to use cells of the same type for track circuit and signal operation, the EDISON-BSCO cell is rapidly replacing the gravity in railway signal service.

Detailed information on request.

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Complete Renewal

The Cheapest Form of Battery Energy

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Thomas A Edison

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Canadian Consolidated Rubber Co.

LIMITED

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"The Signs of To-day"
KEYSTONE
Car Destination Signs

KEYSTONE Car Destination Signs are being adopted by the leading Street Railway Systems of Canada and the United States as fast as the factory can turn them out.

This is not surprising when you consider that they look better—work easier—are less liable to get out of order—and take up less space.

The illustration above shows one of the new Keystone Signs now in use by the Montreal Tramways Company, as seen from the street, and the cut below shows another Montreal Sign as seen from the back.

In the Keystone Sign the rollers are both directly driven by gears, chains and sprockets, and are under constant, uniform tension, which can be readily adjusted by means of a simple brake. No spring rollers, nor, in fact, any springs whatever, are used in any part of the Keystone mechanism. This mechanism occupies less than one inch between the edge of the curtain and the outside of the steel frame or box in which the sign is mounted.

The curtain is printed on one continuous piece of cloth, without any seams or bindings, which consequently does not draw or wrinkle. The printing compound is very dense and durable, giving very clear and lasting lettering. Centering indicators and street indicators are placed for every name on the curtain, making it much easier to adjust accurately under difficult lighting conditions.

By simply loosening one set-screw the curtain and rollers can be readily removed for cleaning the glass or transferring the curtain.

Write us for more information about the Keystone Sign, the guarantee and our prices.

Manufactured by

***Electric Service Supplies Co.,* Philadelphia, New York, Chicago**

Canadian Distributors:

John Millen & Son, Limited

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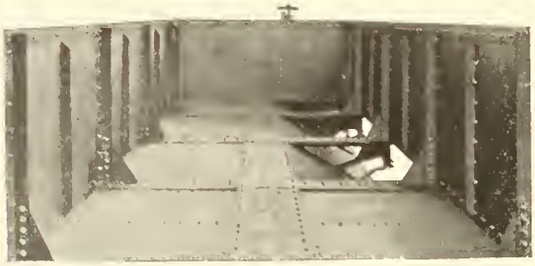
OTIS DUMP CARS

Patented

THE MOST PRACTICAL CAR FOR ALL BULK FREIGHT.

DUMP THE MATERIAL AND SAVE TIME AND MONEY.

ALWAYS READY FOR USE.



All Steel Car with one section open.

THERE ARE THOUSANDS OF OTIS CARS IN USE IN COAL AND GENERAL SERVICE

A SIMPLE, EASY OPERATING LEVEL FLOOR GONDOLA CAR THAT DUMPS THE ENTIRE LOAD

THE **HART-OTIS CAR CO.,** LIMITED :: **MONTREAL**

Canada for the Canadians. *Reciprocity is the Life of Trade.*

SPECIAL ROPES FOR LUMBERING.
WE CARRY IN STOCK ALL SIZES OF WIRE ROPES FOR:
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FITTINGS OF ALL DESCRIPTIONS.

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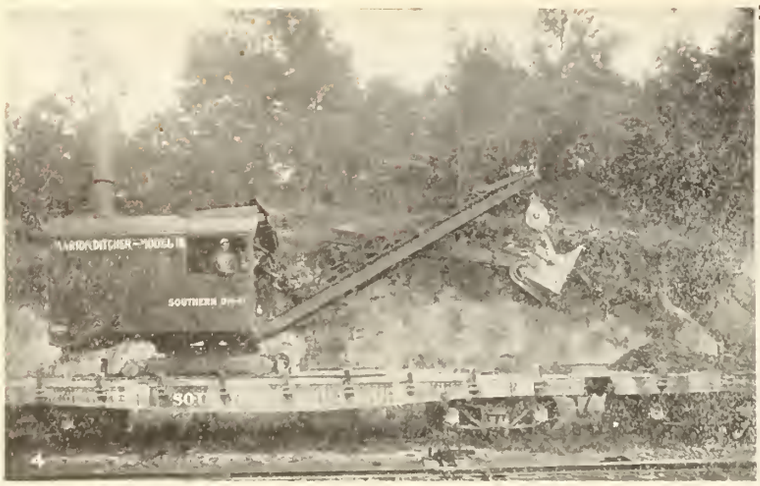
We will gladly mail you our latest Catalog upon request.

Special sizes and lengths of ropes made to order.



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are specially designed for cleaning out or widening old ditches or cutting new ones along the right-of-way

Exclusive Features

Several exclusive and invaluable features are embodied in all Marion Railroad Ditchers. Three independent sets of engines for governing the hoisting, swinging and thrusting motions. Ditchers are equipped with boom raising and lowering device.

MADE IN TWO SIZES — ILLUSTRATIONS AND FULL PARTICULARS UPON REQUEST

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GRAND TRUNK RAILWAY SYSTEM

THE DOUBLE TRACK WAY

offers Excellence in Equipment, Excellence in Service

The Grand Trunk Railway System

The Pioneer Railway of Canada

The only double track railway reaching all important centres in Eastern Canada. Fast Limited trains are operated between all important points on the System, including Montreal, Ottawa, Toronto, Quebec, Portland, Boston, New York, Buffalo, Detroit and Chicago. The equipment on the trains of the Grand Trunk is of the highest standard. Electric lighted Pullman Sleeping Cars on night trains. High grade Parlor-Library, Dining and Parlor-Library-Cafe Cars on day trains. Handsome Club Compartment Cars on Night trains between Montreal and Toronto, leave Montreal at 10.30 p.m., and Toronto at 10.45 p.m.

The "International Limited"

The train de luxe, in Canada, runs every day in the year between Montreal, Toronto, Hamilton, London, Detroit and Chicago. This train is one of the finest and fastest long distance trains in the world.

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The new $2,500,000 hotel, situated in the heart of Ottawa, Ont., the capital of Canada, is one of the finest hotels on the Continent. Accommodation, 350 rooms. Rates, $2.00 and upwards. European plan.

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Located in Winnipeg on the same site as the old "Fort Garry" of Indian days. Centrally located. 300 rooms. Cost $2,000,000. The latest in hotel construction. European plan.

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Beautifully situated in Algonquin Provincial Park. The home of winter sports in Ontario. 2,000 feet above sea level. Winter attractions, snow-shoeing, skating, tobogganing, skiing. Rates, $2.50 to $3.00 per day. $16.00 to $18.00 per week.

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G. T. BELL, Passenger Traffic Manager, MONTREAL. H. G. ELLIOTT, General Passenger Agent, MONTREAL.

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BY USING THE
TATE FLEXIBLE STAYBOLT

TIME HAS DEMONSTRATED

FIRST—That flexible staybolts produce more satisfactory and more economical results than rigid staybolts.

SECOND—That TATE FLEXIBLE STAYBOLTS are best of all, measured by every standard.

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Ask for our New Catalog just issued

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CANADIAN ALLIS-CHALMERS, Limited, General Offices, TORONTO, ONT.

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MODERN HIGH-CLASS

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Norton's Improved

HIGH SPEED JACKS

They lift and lower their full rated capacity
Four Times as fast as other Ball Bearing Jacks of equal capacity.
All Crucible Steel, light and strong.
Send for complete catalogue and Discount.
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Made in Canada by

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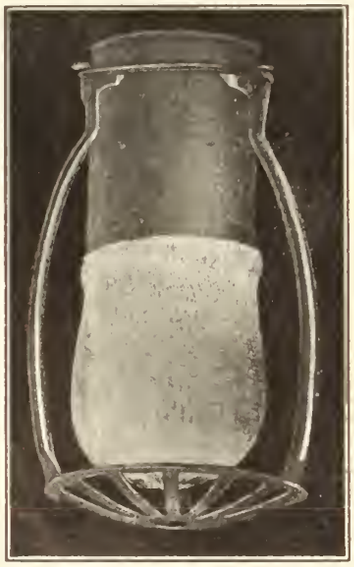

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No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

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718 TRANSPORTATION BUILDING, MONTREAL

MOST MEN

Spend a Large Part of Each Year on Trains

That is Why They Look For

COMFORT CONVENIENCE SERVICE SPEED

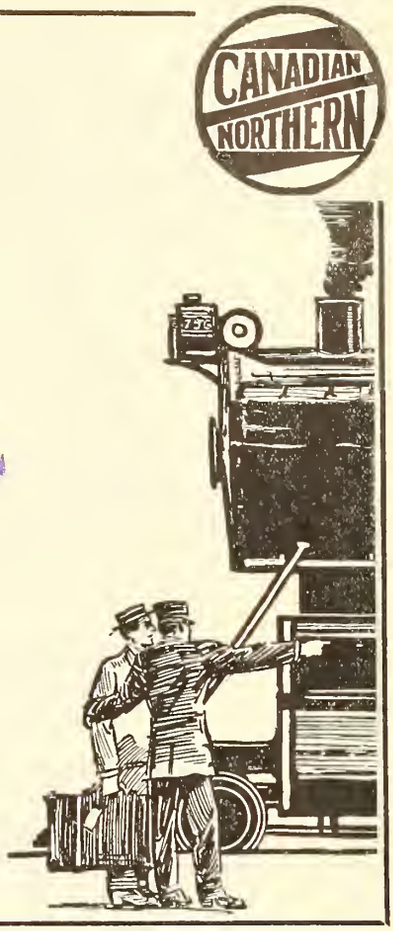
And Find Them Only on the

Solid Vestibuled Trains and Finely Equipped Dining and Parlor Cars of the

CHANGE

Canadian Northern

Reaching all the Chief Centres of Canada



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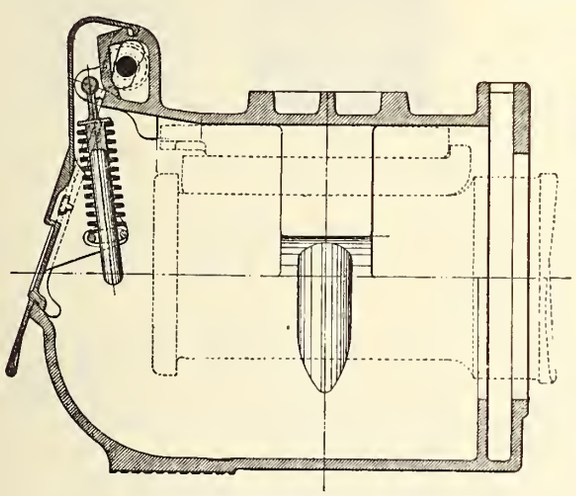

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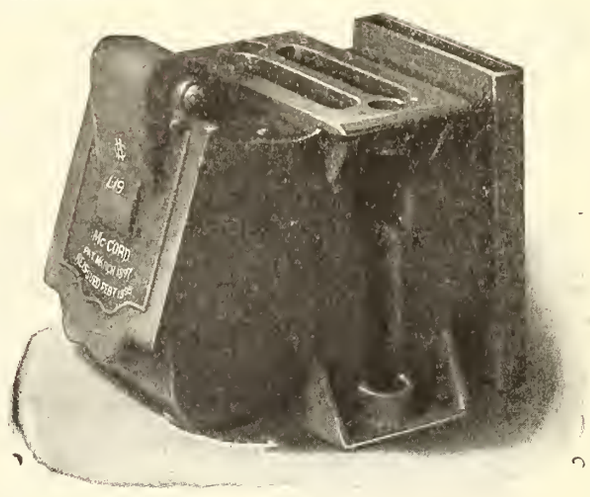

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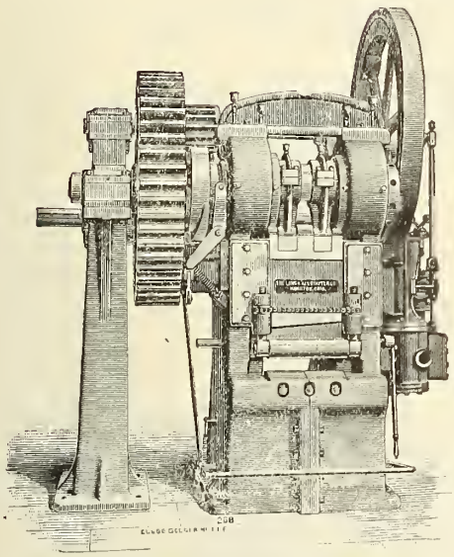

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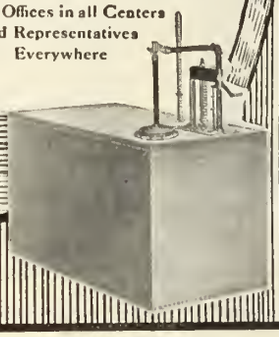

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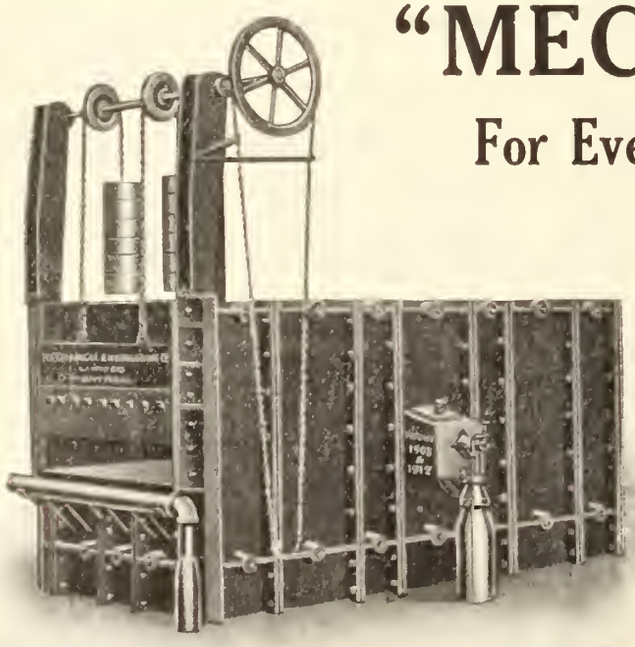

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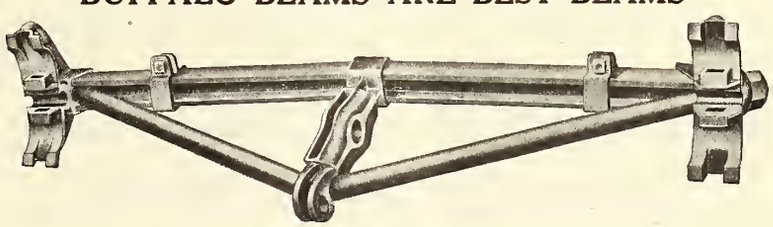

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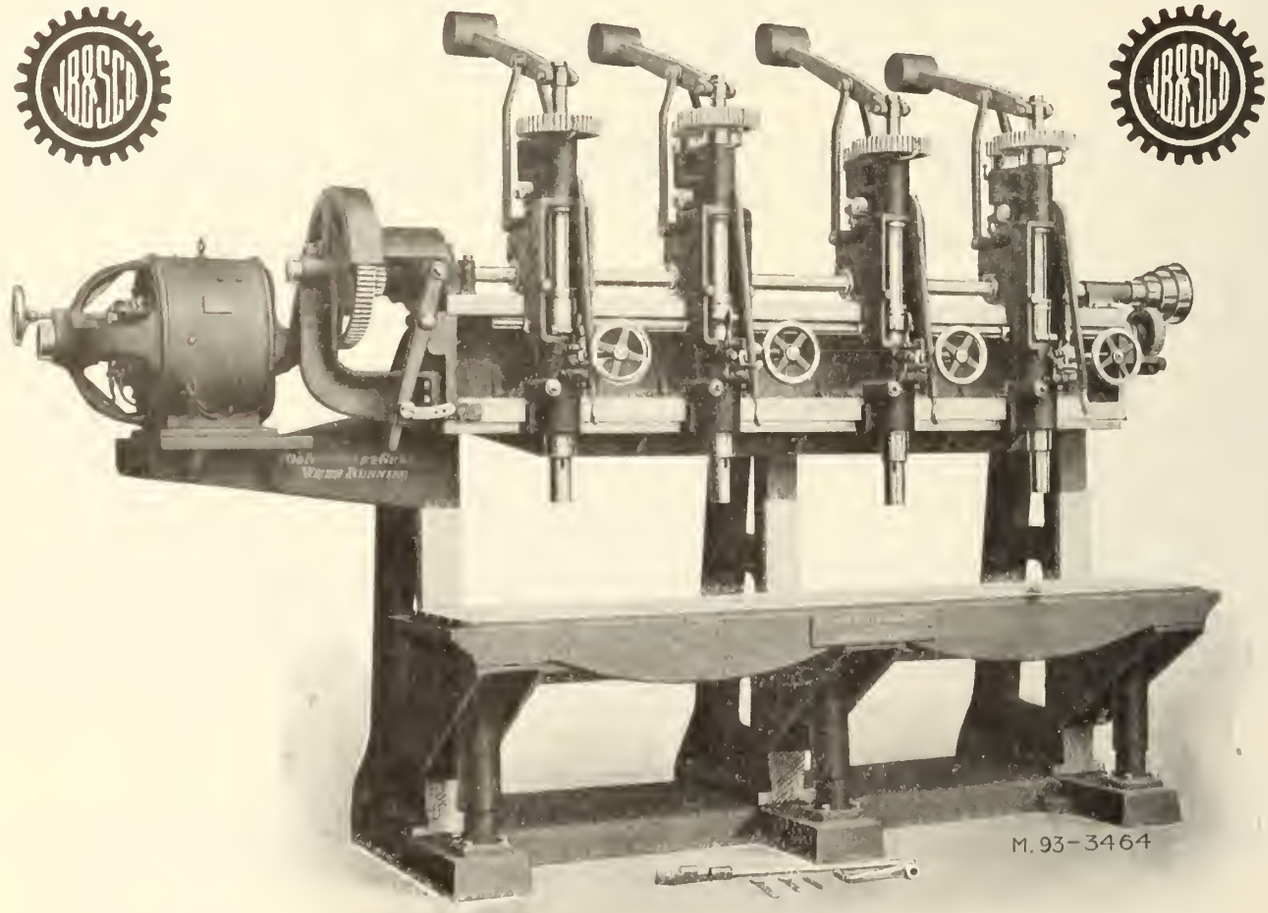

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Canadian Railway and Marine World

March, 1914.

Cast Iron Wheel Records.

By H. H. Vaughan, M. Can. Soc. C. E., Assistant to Vice President, Canadian Pacific Railway.

Practically all railways have abandoned any form of cast iron wheel record which follows the history of each individual wheel. Apart from the enormous amount of work in reporting and entering the movements of several hundred thousand wheels which are in service in a large system, it is practically impossible to avoid incorrect numbers being reported. The difficulty of straightening out the errors that arose, errors which frequently were not disclosed for years after they actually occurred, and the correspondence involved in the attempt, were sufficient reasons for discarding a system that did not furnish sufficient useful information to justify its expense. The writer has not investigated methods used on other roads to describe them with accuracy in this paper, but believes that apart from the records maintained for guarantee purposes, the only systems in general use are those in which the average life of wheels removed from service for various causes, is determined in various ways. It is usual to show a figure for the average life of 12 to 18 years to be shown for wheels, when as a matter of fact they are lasting about 5 or 6.

The figures showing the life of the actual wheels removed can be obtained with considerable accuracy and with simple reports and records. Each wheel is marked with its number, the date cast, etc., so that no complications are introduced by recording the date put into service and the date removed. While no record is usually kept of any time the wheel may be out of service, or the movements of the car under which it has been placed, these factors are relatively unimportant on a large number of wheels, and the average life of the wheels removed is a figure of sufficient importance on any road to justify the records and statements required. It should properly be kept by weight of wheels, so that any alteration that occurs in the life of wheels under the same weight of equipment may be distinguished from the changes due to the introduction of a greater proportion of heavier equipment or similar causes.

known, the number removed in each year's life for each cause may be expressed as a percentage of the number made and this percentage may be compared year by year to determine the comparative service obtained from the different wheels.

As the records are compiled in the C. P. R., no attention is paid to the date the wheel is put into service. For wheels made in any one year, the number removed in that year are taken as being removed in the first year of their life, those removed in the next year, as in the second year of their life and so on. This introduces an inaccuracy in the case of any particular wheels placed in service towards the end of the year, but the error becomes unimportant after a year or so and the labor of compiling the record is greatly reduced. The statement obtained by this system is shown in fig. 1—which gives the results for 600 lb. wheels cast by the C. P. R. in 1902, the first year for which this statement was prepared. Similar statements have been made up for the same weight of wheel with its subse-

FIG. 1—RECORD OF SERVICE GIVEN BY C. P. R. 600-LBS. 33-INCH "CAST IRON WHEELS," A & B SERIES

Year Cast, 1902. Number of Wheels, 30288. Serial Numbers. A 84889-106990, B 1-8177

Year	Worn Flange			Slid Flat			Broken or Chipped Flange			Broken Wheel			Total Operating Defects			Total Manufacturers' Defects			Removed from Tenders			Total Number Removed		
	Number	Percent	Total Percent	Number	Percent	Total Percent	Number	Percent	Total Percent	Number	Percent	Total Percent	Number	Percent	Total Percent	Number	Percent	Total Percent	Number	Percent	Total Percent	Number	Percent	Total Percent
1902	6	0.02	0.02	149	0.49	0.49	8	0.03	0.03				163	0.54	0.54	14	0.04	0.04	118	0.39	0.39	295	0.97	0.97
1903	139	0.46	0.48	503	1.66	2.15	38	0.13	0.16				699	2.31	2.85	332	1.09	1.13	814	2.69	3.08	1845	6.09	7.06
1904	362	1.20	1.68	535	1.77	3.92	41	0.14	0.30				958	3.17	6.02	670	2.21	3.34	264	0.87	3.95	1892	6.25	13.31
1905	915	3.02	4.70	408	1.35	5.27	36	0.12	0.42				1382	4.56	10.58	780	2.58	5.92	82	0.27	4.22	2244	7.41	20.72
1906	1081	3.57	8.27	254	0.84	6.11	21	0.07	0.49				1391	4.59	15.17	816	2.70	8.62	21	0.07	4.29	2228	7.36	28.08
1907	961	3.17	11.44	231	0.76	6.87	46	0.15	0.64				1262	4.16	19.33	676	2.23	10.85	17	0.06	4.35	1955	6.45	34.53
1908	771	2.55	13.99	159	0.52	7.39	21	0.07	0.71				983	3.25	22.58	734	2.42	13.27	12	0.04	4.39	1729	5.71	40.24
1909	641	2.12	16.11	100	0.33	7.72	15	0.05	0.76				785	2.59	25.17	539	1.78	15.05	12	0.04	4.43	1336	4.41	44.65
1910	465	1.53	17.64	88	0.29	8.01	10	0.03	0.79	3	0.01	0.01	579	1.91	27.08	413	1.36	16.41	2	0.01	4.44	994	3.28	47.93
1911	223	0.74	18.38	39	0.13	8.14	7	0.02	0.81	2	0.01	0.02	289	0.95	28.03	294	0.97	17.38	1		4.44	584	1.93	49.86
1912	138	0.45	18.83	30	0.10	8.24			0.81			0.02	175	0.58	28.61	188	0.62	18.00	1		4.44	364	1.20	51 06

wheels obtained by dividing the number in service by the number removed per year, but this figure is not of much value, as it depends more on the rate at which the number of wheels in service increases than on the actual life of the wheels removed. Thus if the number of wheels in service remained stationary for a period of years, while the number of wheels removed increased 25%, it would indicate a decrease in the average life of the wheels of 20%, while if during the same period the wheels in service had increased 50%, the same increase in the number of wheels removed would indicate an increase in the average life of 20%. Now if the increase in the wheels in service had taken place in two or three years, it would have had comparatively little influence on the wheels removed, so that an increase in the life of the wheel might be shown by these figures, while a reduction had actually occurred. In addition reports of wheels removed on foreign lines are not obtained correctly, especially for wheels removed on handling companies account and in general it is not uncommon for a life of

While the average life of wheels removed affords valuable information over a period of years, it does not enable the result of any variation in the quality or service of the wheels to be detected until considerable time has elapsed, and then only in a general way. When the wheel foundry methods of the C. P. R. were revised in 1908, it became desirable to introduce some system by which it could be determined whether better service results were being obtained or not, without the complications of the old individual records. This was accomplished in a satisfactory and simple manner by comparing for each years make of wheels, of the same weight and manufacture, the number removed for various classes of defect in each year of their life. This system does not require any additional reports over those commonly used. The only information needed is the make of the wheel, weight, date cast, maker and cause of removal, items that are likely to be reported accurately and which are those required for a record of any kind. As the number of wheels of any group cast in each year is

quent modification to 645 lbs. and 625 lbs. up to 1912, one of the advantages of this system being that with the records that had been kept it was possible without too much work to go back as many years as necessary to compare the results with those of previous years.

This statement, fig. 1—while giving all the information that is obtained for the wheels it refers to, does not enable any comparison to be made easily, and for that purpose a series of such statements for wheels made in successive years are combined as shown in fig. 2. This statement shows the number of the wheels of the weight it relates to made in each year, and the percentage removed in each year of their life for all causes, except worn flange, slid flat and removed from tenders. A similar statement, fig. 3, shows the percentage removed each year for worn flange, and slid flat and similar statement, fig. 4, shows the percentage of broken wheels and broken and chipped flanges for the same series. It is evident that similar statements may easily be prepared for any cause of remov-

al it is desired to investigate, but those shown are the ones that have been considered important. The elimination of wheels slid flat, worn flanges and removed from tenders, leaves a balance, that while not corresponding to the classification of manufacturers and operating defects, is broadly affected by the quality of wheels turned out, so that the statement, fig. 2, is a record of the foundry output in this respect.

made or purchased for renewals. The former will evidently not be placed under foreign equipment to the same extent, but as this number has been under 10% of the total number placed in service each year its effect can be allowed for.

The reliability of the statement as a whole is confirmed by the fact that since 1908 it shows a decreased percentage of wheels removed and that the average life of the

An important point in this statement is the general agreement of the results shown throughout the life of any series of wheels with those shown in the first year or two. It appears almost certain that if the wheels are of good quality and carefully inspected there will be less poor wheels to fail in the first year or so, and this result will persist throughout their life. This result is certainly true in the case of 1904 and 1908 wheels and if it is confirmed by further experience, this form of statement furnishes a simple method of determining within a comparatively short time the service that may be expected from any group of wheels without the necessity for complicated records.

Figs. 3 and 4 are also interesting statements. Wheels slid flat, or worn flanges are not chargeable against the foundry, but they may be largely affected by the shops. Careless tapping and mating, cars down on side bearings and sundry other causes for worn flanges are all avoidable and results may be followed by means of this report. Slid flat wheels are also caused by improper maintenance and operation and may be

FIG. 2—STATEMENT OF C P.R. 600 & 645 LBS. WHEELS REMOVED EXCEPT ACCOUNT OF WORN FLANGES, SLID FLAT AND TENDERS

Percentage Removed each year

Year Cast	No Wheels Cast	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	Lbs
1912	15384	.06												645
1911	42105	.04	.25											"
1910	35710	.04	.27	.85										"
1909	53390	.03	.38	1.11	2.28									
1908	36165	.11	.56	1.09	1.98	3.16								600 & 645
1907	66730	.30	1.52	3.69	5.85	8.78	12.03	10.						" "
1906	63819	.13	1 05	2.36	4.37	6.19	8.39	10.76						" "
1905	49239	.13	.83	2.40	4.53	7.10	8.98	11.01	13.50					600
1904	32852	.07	.67	1.60	2.84	4.94	7 18	8.62	9.92	10.99				"
1903	35108	.16	1.38	3.45	5.84	8.16	10.96	13 61	15 29	16.54	17.33			"
1902	30288	.07	1.29	2.64	6.33	9 09	11.47	13.96	15 79	17 19	18.19	18.81		"
1901	27749	16	1.10	3.45	6 30	9 15	11.92	14 1	16 6	19 0	20 38	21.60	22.78	"

FIG. 3—C. P. R. WHEELS REMOVED ON ACCOUNT OF WORN FLANGE AND SLID FLATS

Year Cast	No. Wheels Cast	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7th Year		8th Year		9th Year		10th Year		lbs
		W	F	S	F	W	F	S	F	W	F	S	F	W	F	S	F	W	F	S	F	W	F	S	F	
1912	15384	07	.62																			645
1911	42105	01	.26	.04	1.50																	"
1910	35710	01	.21	.07	1.95	.16	3.33															"
1909	53390	01	.47	.05	2.25	14	4.50	.36	5.47													
1908	36165	02	.53	.10	2.31	.33	3 83	.71	5.13	1.42	6.09											600 & 64.5
1907	66730	02	.56	.20	2.41	.84	4 84	1.97	6.52	3.70	8.19	5.67	9.44									" "
1906	63819	.03	.73	.19	3.52	.81	6.13	2.34	8.53	4.39	9.98	6.43	11.27	8.29	12.16							" "
1905	49239	.04	.60	.42	2.67	1.89	4.72	4.28	6.39	7.69	7.97	10.79	8.99	31.41	9.64	15.32	10.14					600
1904	32852	.06	.27	.40	2.57	2.01	4.58	5.44	6.35	9 36	7.74	13 87	8.88	17.36	9 49	19.86	9.81	21.30	10.0			"
1903	35108	.03	.33	.44	1 99	2 46	3 61	6 01	4 93	9.84	5 80	13 31	6.64	16.40	7.35	18.51	7.70	19 72	7.96	20.55	8.13	"

FIG. 4—C P. R. WHEELS REMOVED ON ACCOUNT OF BROKEN FLANGE OR WHEEL

Year Cast	No. Wheels Cast	1st Year		2nd Year		3rd Year		4th Year		5th Year		6th Year		7th Year		8th Year		9th Year		10th Year		
		B	F	B	W	B	F	B	W	B	F	B	W	B	F	B	W	B	F	B	W	B	F	B	W	&
1912	15384	.02																				600 645 lbs.
1911	42105	.01		.04	.002																	
1910	35710	.01		.04		.07																
1909	53390	01		.06	.003	.10		.19	.005													
1908	36165	.02		.08		.14		.21	005	.28	.02											
1907	66730	.07		.18		.34		.53	.005	.68	01	.85	.02									
1906	63819	.05		.37		.61		.87		1.13	.005	1.35		1.52	.011							
1905	49239	03		.17		.46		.65		.80		1.04	.004	1.19	.01	1.31	.016					
1904	32852	.04		.12		.29		.48		.62		.71		.82	.003	.87		.93				
1903	35108	.03		.16		.29		.46		.64		.77		.87		.96	.003	1.04	.006	1.11		
1902	30288	03		.16		.30		.42		.49		.64		.71		.76		.79	.01	.81	.02	
1901	27749	02		.11		.19		.31		.46		.54		.63		.67		.70		.76		
1900	31060	02		.13		.29		.40		53		.61		67		.74		.79		83		

This statement shows several interesting features. There is evidently a decided variation in the percentage of the wheels removed of different years make, and it is only reasonable to suppose that where a larger percentage is removed in a given time, say 6 or 7 years, the life of the wheel is less. If this be granted some years makes are evidently considerably superior to others, for instance those made in 1904 were far better than the average, while those made since 1908 have been uniformly good.

If all wheels made were accounted for, there would of course be no assumption involved, but by an inspection of fig. 1 it will be seen that of the wheels made in 1902, only 51% have been accounted for in 1912. It is improbable that 49% are still in service and the difference is therefore to be accounted for by wheels placed under foreign cars or removed on foreign roads and not reported. This discrepancy might be reduced if the number of wheels of any make placed under foreign cars were deducted from the number made before calculating the percentage, but it would introduce a complication of doubtful advantages. The chief effect of this factor is in comparing wheels received under new cars with those

FIG. 5—MANUFACTURER. A

Percentage Removed Each Year

Year Cast	No. Wheels Cast	1st	2nd	3rd	4th	5th	6th	7th	Lbs.
1912	24975	.04							645
1911	19527	.05	.47						"
1910	8950	.08	.53	1.51					"
1909	8614	.14	.60	1.49	2.62				"
1908	23018	.04	.61	1.38	2.92	4.54			"
1907	14000	.04	.35	1.02	1.98	3.20	4.61		600
1906	1800	.16	.55	1.05	3.00	4.11	5.61	6.78	"
				MANUFACTURER. B.					
1907	4000		.22	1.90	4.32	7.36	11.36		600
				MANUFACTURER. C.					
1907	4000	.10	1.12	2.60	4.48	6.23	10.21		600

wheels removed has since that time increased as follows

Year	Manufacturers' Defects.	Operating Defects.	Total
1908	5 Yrs. 2 Ms.	4 Yrs. 5 Ms.	4 Yrs. 8 Ms.
1909	5 " 2 "	4 " 7 "	4 " 9 "
1910	5 " 7 "	4 " 9 "	5 " 0 "
1911	5 " 4 "	4 " 9 "	4 " 11 "
1912	5 " 9 "	5 " 0 "	5 " 4 "
1913	5 " 11 "	5 " 5 "	5 " 7 "

largely reduced by care.

It will be seen from this statement that there is comparatively little difference between the wheels removed for being slid flat of the various years make. There is, however, a most decided difference in the number removed for worn flange, the wheels made in 1906 being considerably better than those of previous years, while there is a still greater reduction in 1908. The percentage of 1908 wheels removed in 5 years

1903, 1904, and 1905. In 1908 the method from this cause is only about 40% of the number removed in an equal time of the 1906 wheels and less than 20% of the corresponding number for the wheels made in

FIG. 6—MANUFACTURER. A.

Year Cast	Wheels Cast	1st Year W	F	S	F.	2nd Year W.	F.	S.	F.	3rd Year W.	F.	S.	F.	4th Year W.	F	S.	F.	5th Year W.	F.	S.	F.	6th Year W.	F.	S.	F.	7th Year W.	F.	S.	F.	Lbs.
1912	24975	.03	.11																											625 & 645
1911	19527	.03	.28	.12	1.46																									645
1910	8950	—	.39	.10	1.97	.41	5.27																							..
1909	8614	—	.37	.07	1.47	.26	3.28			.70	4.70																			..
1908	23018	.02	.19	.08	2.07	.20	3.59			.66	5.03	1.46	6.02																	..
1907	14000	.04	.31	.14	1.59	.43	2.98			1.20	4.32	2.29	5.13	3.66	5.82															600
1906	1800		.78	.17	1.50	.34	2.22			1.12	3.44	1.90	4.44	2.96	4.82			3.35	5.26											..
										MANUFACTURER. B.																				
1907	4000		.05		.90	.02	.313			.10	5.53	.52	6.55	1.79	7.73															600
										MANUFACTURER. C.																				
1907	4000		.05	.02	.68	.02	2.15			.52	4.10	.87	5.32	2.34	6.77															600

worn flanges, slid flat, and removed from tenders. These diagrams illustrate the statement that a group of wheels that show up well in the first two years will show correspondingly good results throughout later years. They are also interesting as showing the great difference between various groups of wheels and the improvement that took place in 1908 and subsequent years. Figs. 11, 12, 13, and 14 show the wheels removed for worn flange, slid flat, broken or chipped flange and broken wheels for the C. P. R. 600 lbs. wheel, for which statements were given in figs. 3 and 4, and illustrate in an interesting way the numerical results which have been referred to.

Reference has been made throughout this paper to the revision of the C. P. R. foundry methods in 1908 and to the results obtained since that date, which evidently show a considerable improvement. Prior to that date the mixture had been handled by

of taping was carefully gone into and the work carried on with greater care, so it would appear that the proper carrying out of this work is most important to avoid injury to wheels from worn flanges. To the end of the 4th year the 1909 wheels are even better, so that the 1908 results were not simply accidental, but the consequence of greater care and better methods.

Fig. 4, showing broken and chipped flanges and broken wheels, is also instructive. Unfortunately no distribution is made between broken and chipped flanges, but two facts are certainly shown. The most important is that broken and chipped flanges have been greatly reduced since 1908, and since there seems no reason for any change in the chipped flanges, it is to be hoped that the broken flanges have been largely eliminated. The second is that broken wheels are a most unimportant factor, the number rarely amounting to one tenth of 1% in 10 years. These facts are of the greatest interest as showing the excellent service that may be obtained from a well made chilled wheel.

Figs, 5, 6, 7, show similar statements for the wheels supplied by three separate manufacturers, giving the same information for the same weight of wheel as figs. 2, 3, and 4. It will be seen in fig. 5 that 1907 wheels from manufacturer A compare very closely with the 1908 C. P. R. wheels on the percentage removed for foundry causes, but that for the balance of the groups of wheels, poorer results are shown. In fig. 6 the removal of wheels for worn flanges from manufacturer B is exceedingly small, while the number removed from other manufacturers compare with the later C. P. R. results. Wheels from manufacturers B and C were received under new cars, so that it would appear that in the case of B particular care was taken with the taping. In fig. 7 there is a peculiar circumstance. The broken and chipped

FIG. 7—MANUFACTURER. A.

Year Cast	No. Wheels Cast	1st Year B.	F.	B.	W.	2nd Year B.	F.	B.	W.	3rd Year B.	F.	B.	W.	4th Year B.	F.	B.	W.	5th Year B.	F.	B.	W.	6th Year B.	F.	B.	W.	7th Year B.	F.	B.	W.	Lbs
1912	24975	.02																												645
1911	19527	.02				.07		.01																						..
1910	8950	.03				.18				.26		.01																		..
1909	8614	.03				.23				.42				.58																..
1908	23018	.03				.11				.19				.32				.42												..
1907	14000	.01				.11				.17				.31				.38				.42								600
1906	1800	.11				.17				.34				.40				.46				.57				.68				..
										MANUFACTURER. B.																				
1907	4000																	.02				.02								600
										MANUFACTURER. C.																				
1907	4000					.08				.16				21				.29				.31		05						600

plotted records for a number of different from C. P. R. 1908 and 1909 wheels, but there are practically no broken flanges and no broken wheels from manufacturer B. This question is being investigated, but without any reason being so far obtained.

Before leaving this description of these records it is interesting to note that they

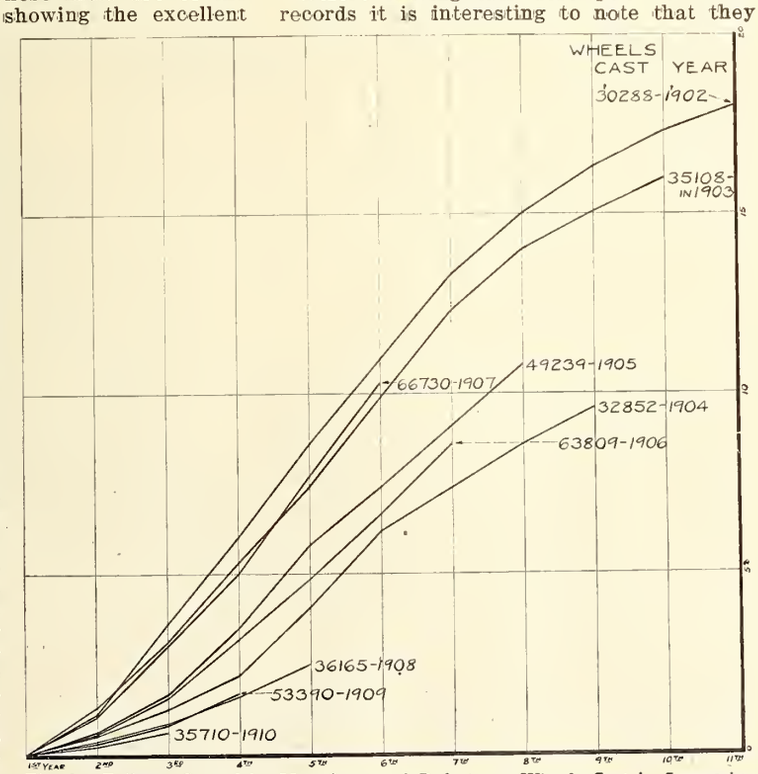


Fig. 8.—Failures Caused by Manufacturers' Defects on Wheels Cast in Successive Years for 60,000 lbs. Capacity Cars for C.P.R.

may be easily plotted and figs. 8 to 14 show weights of wheels of C. P. R. make. Figs. 8, 9, and 10 show the percentage of wheels of 600 lbs., 650 lbs., and 700 lbs. weight respectively, removed for causes other than

brands and numbers and as the records show in some years very good wheels were made and in others the results were not as good.

In 1906 and 1907, considerable trouble arose, a large number of failures occurring in service, caused, as was subsequently discovered, chiefly by iron of widely varying silicon content, but of the same brand, being used indiscriminately. The system of inspection was not sufficiently thorough to reject all wheels of improper quality, and while the records in use at that time did not indicate anything unusual, sufficient trouble developed in service to draw attention to the irregularity in the wheels. Ira B. Lesh was engaged to organize the manufacture on a basis in which the mixtures would be accurately determined by chemical analysis and the inspection effective to reject any of the product that was not of the proper quality. A proper mixture is of course only one of the factors entering into the manufacture of a satisfactory wheel and considerable attention was paid to other points as well with the results that obvious defects disappeared while the records show that a permanent improvement was obtained.

It is not the intention to make this paper one of the manufacture of chilled cast iron wheels, but in view of the enormous importance of the subject, it is interesting to describe the lines on which the C. P. R. practice has been developed and discuss the opportunities for improvement.

The writer considers one of the most important factors in obtaining good wheels is that of inspection. Absolutely uniform and perfect foundry practice is of course the great thing to obtain and the most difficult, but that is the portion of the subject which would be better described by some competent wheel manufacturer. Inspection should detect those wheels which for any reason depart from the accepted quality, and for this purpose the wheels to be tested should be selected with care and sufficient wheels broken from any days run to en-

sure the rejection of any that are either too hard or too soft. This may be accomplished by comparing the tapes and chill tests and rejecting all soft and hard wheels until it can be determined within reasonable limits that the wheels accepted are good.

Inspection should of course, detect all ordinary defects, but it can be carried on to properly protect the heat, and this is most important. One thing should be remembered, that out of the ordinary lot of wheels, 60% will run through their life and be removed without any defect that reduces the life of the wheel so that it looks very much as though the question of getting the other 40% out of the way by better practice or improved inspection were the important ones.

The question of mixtures is a very vexed one. Prior to 1908 charcoal iron was extensively used on the C. P. R., and the trouble that occurred was caused by its improper use and not on account of its quality. Since that time its use was abandoned for about two years and it has subsequently been employed to the extent of 10 or 15% of the mixture. In spite of the great reputation of charcoal iron, it is a question to what extent it can be better than coke iron after being melted up in a cupola heated by

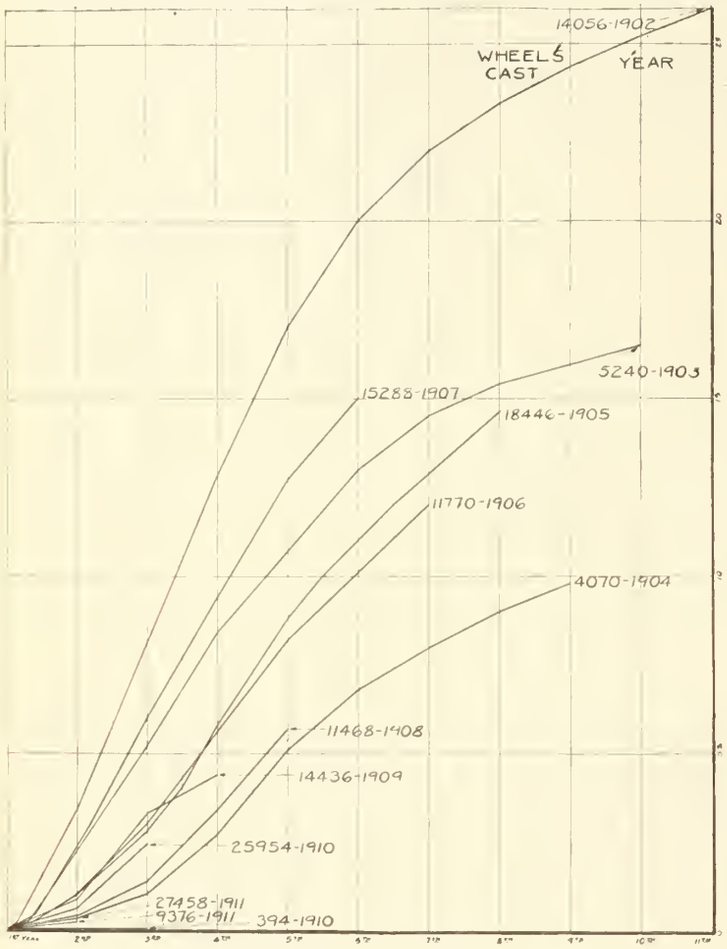


Fig. 9.—Failures Caused by Manufacturers' Defects on Wheels Cast in Successive Years for 80,000 lbs. Capacity Cars for C.P.R.

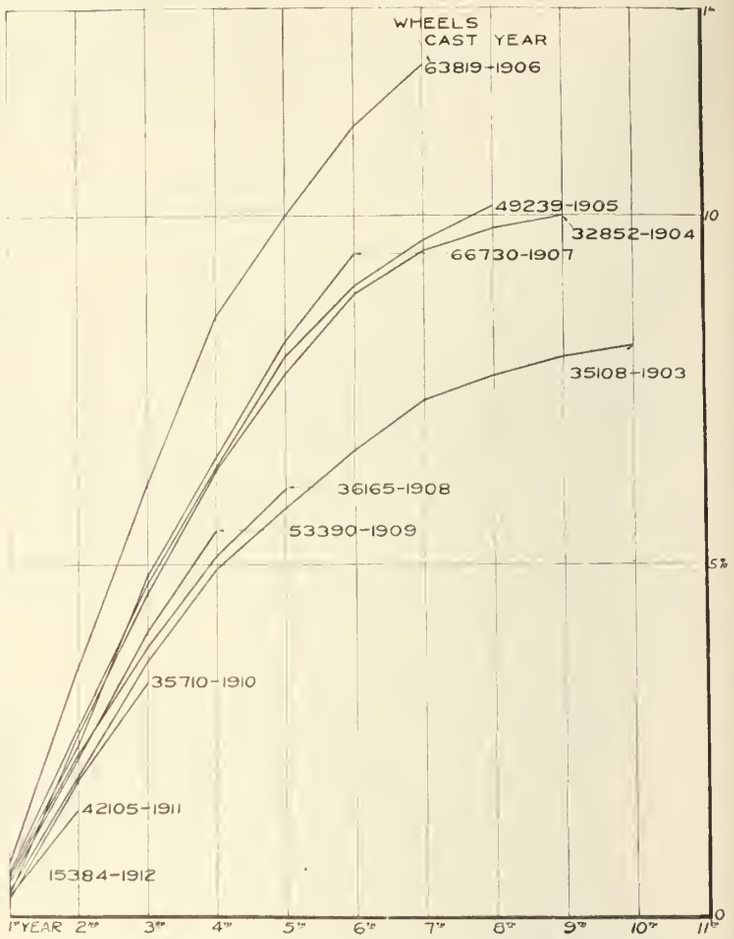


Fig. 12.—C.P.R. Wheels Removed on Account of Slid Flats.

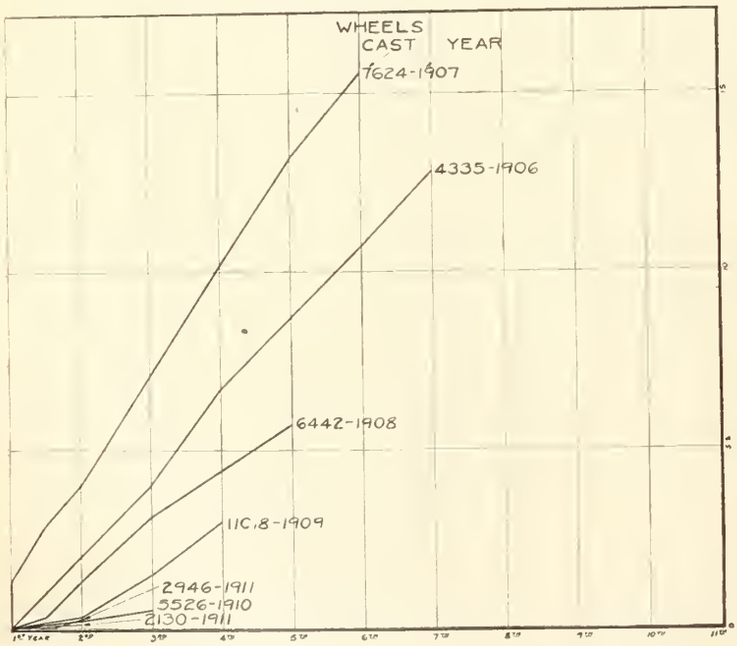


Fig. 10.—Failures Caused by Manufacturers' Defects on Wheels Cast in Successive Years for 100,000 lbs. Capacity Cars for C.P.R.

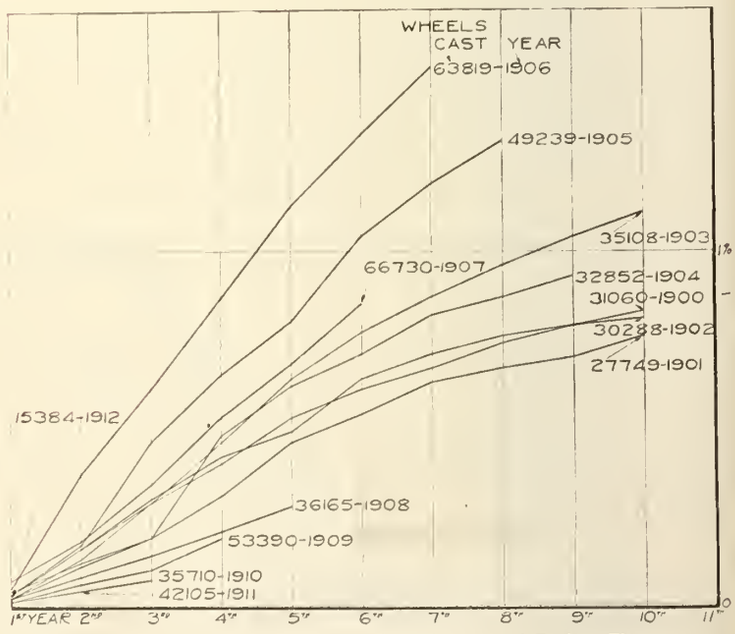


Fig. 13.—C.P.R. Wheels Removed on Account of Broken Flange.

coke. This statement is not intended to refer to the use of iron with a low sulphur content to prevent the constant increment in sulphur which occurs from remelting with coke, but refers to the value of charcoal iron as against coke irons. Good results have certainly been obtained from the latter if properly handled, but on the other hand if any advantage in strength can be shown for charcoal iron the additional cost is not worth considering. The great question at the present time is that of improving the quality of the chilled wheel. It has only one serious point of weakness, the danger of broken flanges. The records show that the number of broken flanges has been greatly reduced since 1908. If this is correct, the causes are, the reinforced flange, careful manufacture, good inspection and a rather hard wheel. The reinforced flange was introduced in 1906-7 when the 600 lbs. wheel was changed to 645 lbs. and it would appear that this change made a grey iron beneath it taking less than its share on account of its greater elasticity. It is therefore necessary to maintain a sufficient depth of white iron to resist a force of this nature, which is that brought on the flange by the rail, and it is evident that the white iron is greatly assisted when backed up by a large amount of grey iron, which is the case when the flange is reinforced as in the latter designs of wheels. This is probably the correct explanation of the greater amount of flange breakage with soft wheels, and it is apparently confirmed by the results that have been obtained.

There is good ground for expecting that the use of the reinforced flange and better knowledge of the causes governing the strength of white iron may lead to considerably better results being obtained from the chilled wheel in the future.

On light equipment, with less severe brake service than is usual today, the chilled wheel has given excellent results and is

Book Reviews.

Any of the books reviewed my be obtained through Canadian Railway and Marine World at the published price.

AMERICAN RED CROSS ABRIDGED Text Book on First Aid (Railroad Edition).—By Major C. Lynch, U.S.A. 150 pages, 5 by 7 ins., 19 plates. Paper cover. P. Blakiston's Son and Co., Philadelphia, Pa. 50 cents.

GOVERNMENT OWNERSHIP OF RAILways.—By S. O. Dunn, Editor Railway Age Gazette. 400 pages, 5 by 7½ ins. Cloth. D. Appleton & Co., New York. $1.50 net, $1.62 post paid.

This is a comprehensive discussion of the desirability of government ownership of railways under different political and economic conditions, and especially of the desirability of government ownership of railways under the political and economic conditions existing in the United States. It gives concisely the history of the relations between railways and the state in the leading countries, and outlines the causes which have led to the adoption of government ownership where it now prevails. It then discusses the following points: The relative economy and efficiency of public and private ownership and management. The adequacy, quality and safety of the transportation service rendered by railways under the two policies. The policies followed and the results of ratemaking under public and private management. The financial results to the public of state ownership. The effects of public ownership on the condition of labor. The political effects of government ownership. The concluding chapter summarizes the discussion in the preceding parts of the book and the conclusions reached.

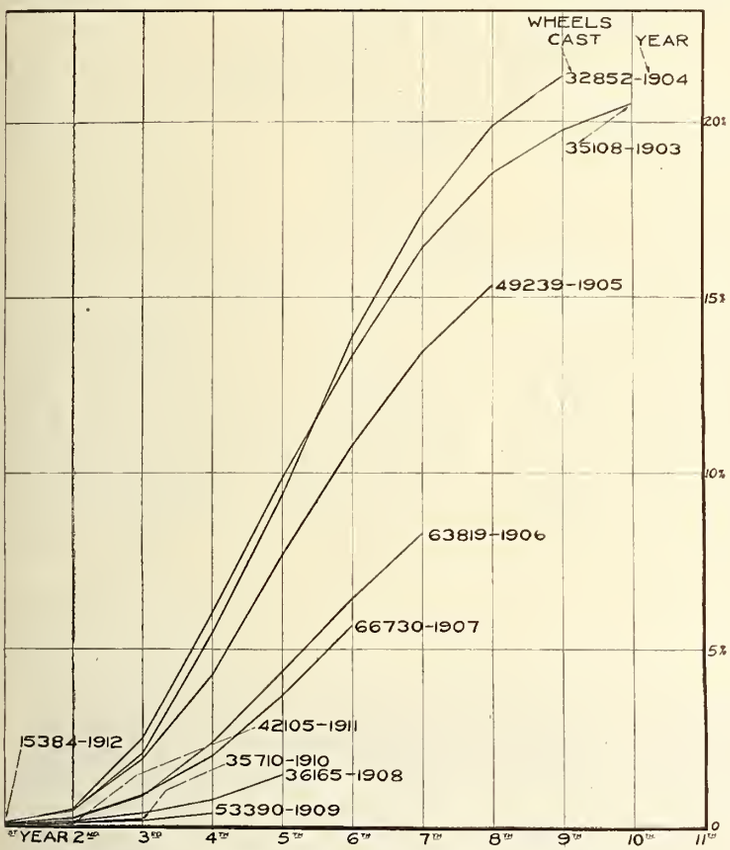


Fig. 11.—C.P.R. Wheels Removed on Account of Worn Flange.

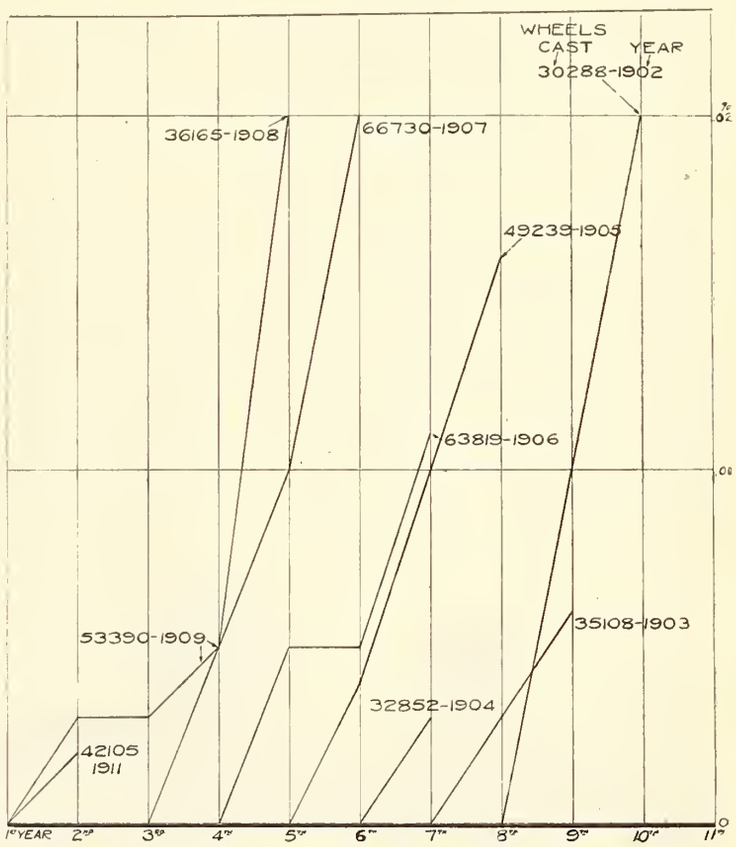


Fig. 14.—C.P.R. Wheels Removed on Account of Broken Wheel.

great improvement.

The C. P. R. practice has during the past few years run to a hard wheel, the rule being to use the M. C. B. limits for depth of chill, applying them to the pure white iron only. This was introduced on account of an investigation made of a number of wheels causing derailments on account of broken flanges, which showed that the majority were soft wheels, having 3-8 in. or less depth of chill. It would certainly appear that a light chill is a cause of weakness, not only in the tread under heavy loads, but in the flanges. This may be explained by the structure being that of a hard rigid surface joined to a softer and less rigid back. Grey iron while often considered as a rigid material has only about 50 to 60% of the rigidity of the white iron, which probably corresponds closely to that of hardened steel. When this compound structure is subjected to any force, placing a tensile strain on the surface, this strain is largely localized on the layer of white iron, the even now most economical and satisfactory in most respects. Flanges practically never break through the line in which they are restricted in strength, and until they do so, there is every reason to hope that the cast wheel may be able to hold its own, and in time to render the good service it has in the past.

The foregoing paper was read before the Canadian Railway Club in Montreal recently.

Where tube lengths of 12 or 14 ft. were common 14 or 15 years ago, lengths of 20, 22 and even 24 ft. are used in present day practice, with the result that smokebox temperatures have decreased from about 750 to 800 degrees, to 550 to 600 degrees, the only increase of energy required being the slightly greater draft in the smokebox to pull the smoke through the longer tubes.

The maximum rate of combustion per sq. ft. of grate area per hour for bituminous coal of good quality is 120 lbs., and for hard coal, from 55 to 70 lbs.

The evaporative value of tubes or flues varies with the difference in length, diameter and spacing.

Esquimalt and Nanaimo Railway Mechanical Terminal Facilities at Victoria, B.C.

The recently completed group of buildings forming the Esquimalt and Nanaimo Ry. terminal plant at Victoria West, B.C., comprises a locomotive house, machine shop, car repair shop, boiler and engine houses, store, etc.

The locomotive house has 10 stalls, each 13 ft. 7 ins. at the front, 26 ft. 5 ins. at the back, and 90 ft. deep. The walls are of 13 in. brickwork on strong concrete foundations, and the roof is of timber construction covered with felt and gravel. The usual locomotive pits are provided, together with one drop pit 7½ ft. wide. The walls of these are of 10 in. concrete, to which is fastened, by means of anchor bolts, the 6 by 12 in. timbers carrying trackage. For a width of 3 ft. all around the pit, 3 in. planking is spiked, the intervening floor space being finished off with cinders.

The machine shop is 68 by 112 ft., and 18 ft. high to the under side of roof truss, and is provided with two locomotive pits and one drop pit similar in construction to those in locomotive house. The shops abut end on to the back of the locomotive house, one track entering from the end stall, and one from the outside of the locomotive house, thus providing outgoing and incoming tracks over turntable. The roof is pitched and is carried by six timber trusses at 16 ft. centres; these are supported on brick piers standing out 4½ins. from the 13 in. walls. Good lighting has been secured by three large skylights on the roof, together with ample sidelights, two windows being fixed in each bay. Bench accommodation has been supplied for the fitters, and the whole floor has been planked over. A width of about 36 ft., extending the length of the building, has been reserved for the installation of machinery tools, which are now being fixed, and include:—18 ft. wheel lathe, 16 ft. Bertram lathe, Bertram gap lathe, 20 ft. gap lathe, 8 ft. screwing machine, small Bertram lathe, a large and a small drill, wheel press, planer, and shaper. The main shafting will be bracket fixed to the brick piers, and the counter shafting to the underside of the roof trusses.

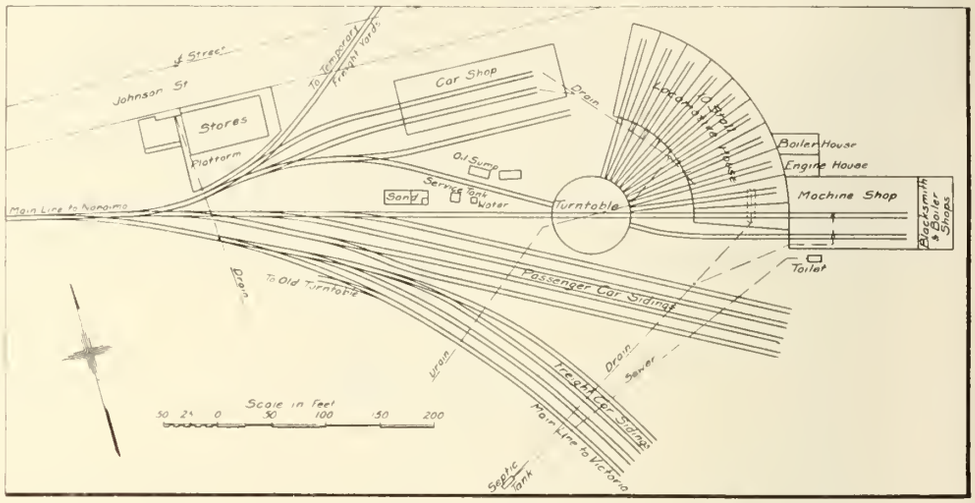
The blacksmith and boiler shop is a continuation of the machine shop, partitioned therefrom by a 9 in. brick wall. In it will be located the steam hammer, two circular and one oblong forges, together with one set of shears and one set of rolls. This building is 32 by 68 ft.

The engine room and boiler room are located in the angle formed by the two main buildings, the former being 31 ft. 10 in. by 20½ ft. and the latter 45¾ ft. by 19¼ ft. The engine provided is 75 h.p. and of the tandem compound type. The air compressor is of the imperial cross compound steam driven type X, made by the Ingersoll-Rand Co. Two 100 h.p. standard C.P.R. locomotive type boilers, carrying 130 lbs. pressure, are being installed. They are equipped for fuel oil, which will be pumped to the burners from a 4 by 6 ft. circular auxiliary tank, located underground outside the building. This tank, in turn, will be supplied by gravity from the service tank located near the turntable.

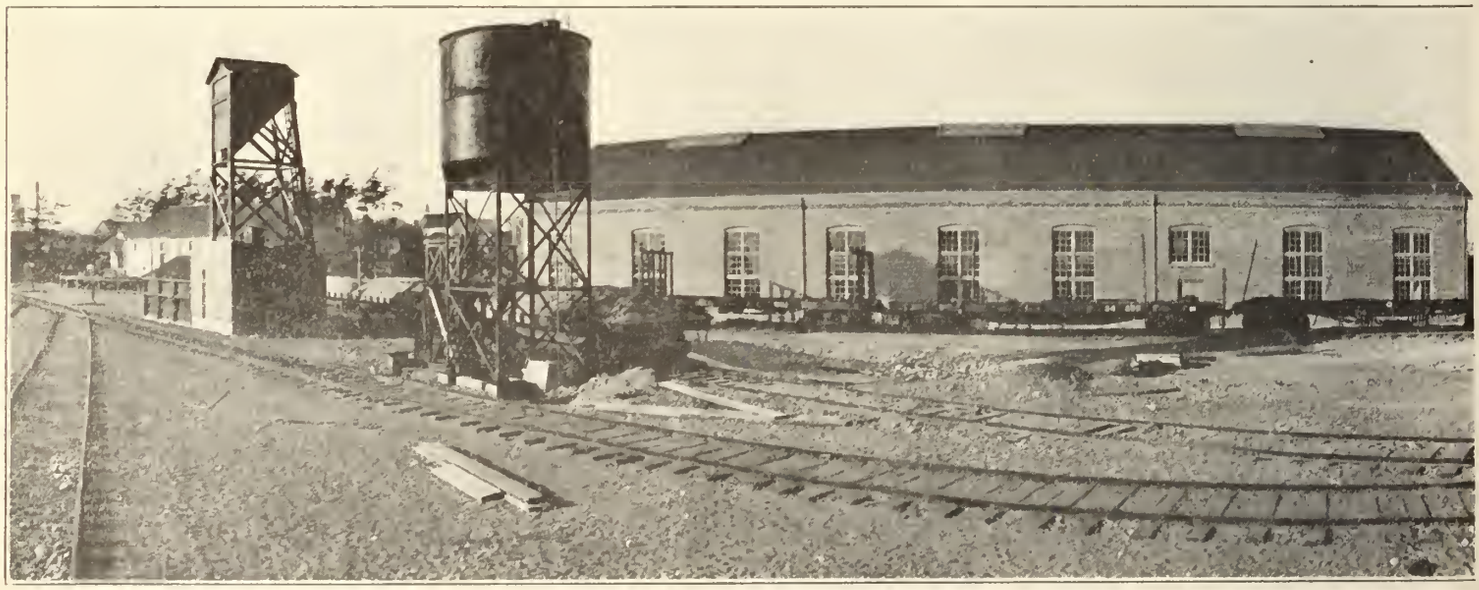
The car repair shop is 50 by 150 ft., and of 13 in. brickwork. The roof is pitched and covered with corrugated iron, the whole being carried by eight timber trusses at 16¾ ft. centres. Here, as in the other buildings described, car pits of concrete construction are provided, together with the usual features necessary for the economical handling of repair work.

The store is one story and basement, the walls of the former being 13 in. brickwork, and of the latter of 18in. concrete. On the ground floor a space of 38 by 56 ft. is reserved for the store proper and is equipped with a hand power elevator to serve the basement, and also shelving for the reception of supplies. At the east end of this floor there are three rooms, the outer two being offices for the Master Mechanic and Storekeeper respectively, while the centre one is intended to house seven Bowser self registering oil pumps. The different varieties of oil to be used will be stored in 2 by 4 by 12 ft. oblong tanks, made of 3-16 in. plate. These are located in the basement in a reinforced concrete fireproof chamber, 15½ by 24½ ft., the feed piping leading direct therefrom to the Bowser pumps above. The remainder of the basement floor is intended for the storage of heavy material brought down by the elevator. A platform has been erected round three sides of the building to facilitate the handling of deliveries from the track and street.

Eight feet from the centre of one of the tracks leading across the turntable is the concrete fuel oil storage tank, 22 by 8 by 10 ft. high, which is entirely underground. The walls are 10 ins. thick with a 12 in.



Esquimalt and Nanaimo Ry.'s Mechanical Terminal Layout at Victoria, B.C.



Panoramic View Esquimalt and Nanaimo Railway Mechanical Terminal. See opposite page.

roof, the latter being strongly reinforced with T iron and expanded metal to ensure the safe carrying of trackage above. Near the storage tank, and equidistant between the two tracks crossing the turntable, stands an 8,000 gal. circular steel service tank, supplied by pump from the storage tank, from which the oil proceeds by gravity to the auxiliary tank near the boiler house. Locomotives will also receive their supply of fuel here by means of two sway pipes which radiate from the bottom of the tank, one to each track. Close by is the water standpipe, so that when taking oil, locomotives can also receive their water supply without change of position. A sand plant has been built 20 ft. from the water standpipe along the same track. The erection is of timber construction and of standard C.P.R. design. Generally speaking, the whole plant as above described is of an up to date character, all buildings are lit throughout by electricity, and are also equipped with water hydrants for fire protection.

The buildings are located to the extreme northwest of the ground, being alloted for terminal purposes. The layout of the freight yards, sheds and passenger station has not been completed, but the accompanying plan indicates the general scheme, so far as the shop layout is concerned.

The work of erection commenced April, 1913, and has been carried out by the contractor, E. R. Doe, of Victoria, B.C., under the direction of R. A. Bainbridge, Division Engineer, with A. L. Kennedy as Engineer in Charge. We are indebted to H. E. Beasley, General Superintendent, for the foregoing information.

The Most Powerful Electric Locomotives.—The New York Central Rd. is having built for its terminal service six electric locomotives which will be the most powerful yet constructed. They will be capable of developing 2,000 horse power continuously or 2,600 horse power for one hour. The equivalent tractive effort is 14,000 lbs. at 54 miles an hour continuously, or 20,000 lbs. at 49 miles an hour at the one hour rating. Each locomotive will haul, if necessary, a 1,200 ton train on level track, continuously, at 60 miles an hour. They are insulated for 1,200 volts to enable them in the future, should it be desired, to operate on this voltage. They have a higher efficiency than any other high speed electric locomotives yet built.

Proposal for Appointment of Royal Commission on Transportation.

The Canadian Society of Civil Engineers has submitted the following memorial to the Dominion Government:—

The time is now opportune to appoint a Royal Commission on transportation and allied problems. The early opening of the Panama Canal and the great development in all lines of industry from one end of Canada to the other raise questions demanding the most careful solution.

The report of the Transportation Commission made in 1898 contains a great deal of valuable data, but is now largely obsolete.

Such a Commission should consist of seven members, viz.:—one railway engineer, one hydraulic engineer, one railway manager, a lawyer, a transportation manager familiar with lake and ocean navigation, two eminent business men, one from the east, one from the west, and a secretary. Such report should include and, whenever possible, make recommendation on the following matters:

Water Routes.—River improvement, lake and gulf, dealing with existing systems—proposed systems from the commercial and engineering sides, harbors, docks, graving docks, types of ships and barges for inland service.

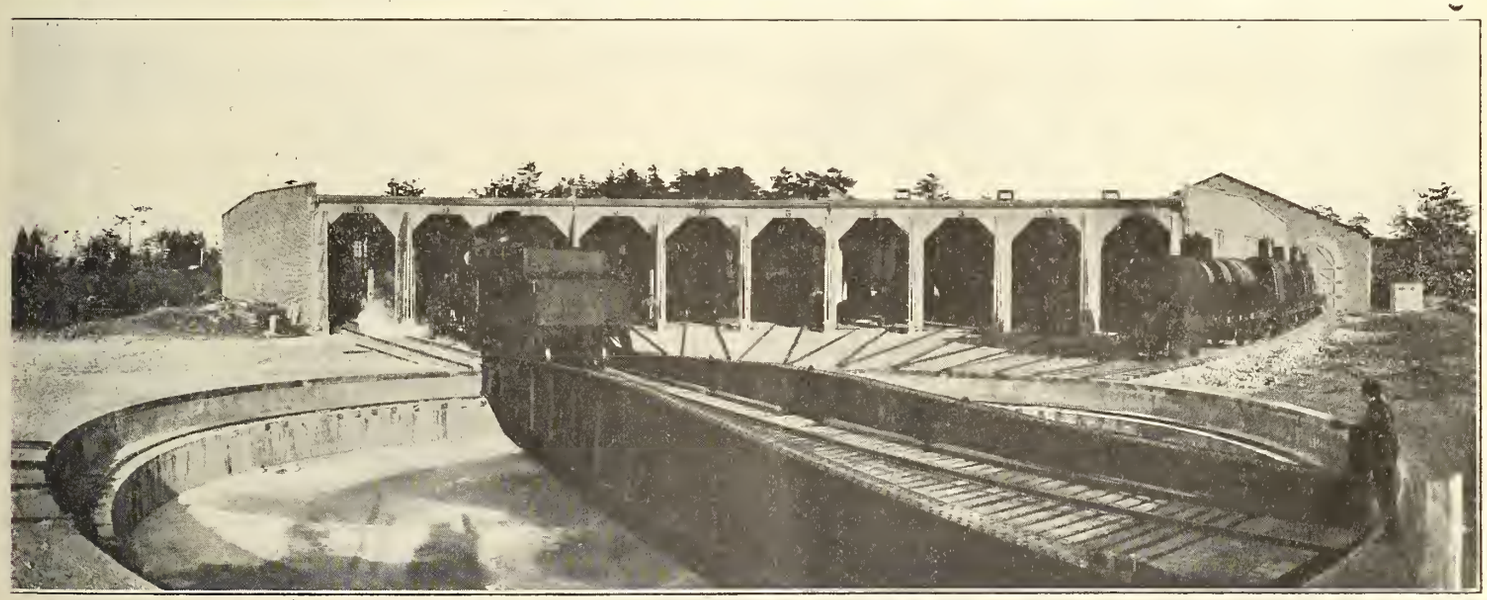
Winter and other Ports.—National and local, required facilities and equipment having regard to the handling of grain, merchandise, manufactures, coal and the other heavy bulk products to the end that the most economical method be secured. There is a necessity for an even, steady movement of traffic throughout the year. How may this be accomplished at the least possible cost to the people of Canada? The water power possibilities, as an incident of navigation on the St. Lawrence, Ottawa, and other important rivers. It is believed by competent men that the St. Lawrence may be converted into slack water navigation from Montreal to Lake Ontario by the building of about five dams and five ship several million horse power of energy may be had at very low cost. Such a possibility suggests a development in manufacturing of incalculable value to the country and would seem worthy of special report. The existing canal system on the St. Lawrence is expensive to maintain and operate. The suggested system would seem to offer an canal locks, and that as an incident thereto, opportunity for large savings in both respects.

Railways.—In what respect is it possible to improve, having regard to terminals, receiving and delivering freight in large cities and at other important points? How may transportation be rendered more economical? What should be the policy of the country regarding new railways? What conditions should be made on behalf of the public? A reasonable definition of what earnings and expenses should be. To what extent should regulation extend in order that capital may be secured for the continued requirements of the country and the public be sufficiently protected?

Routes and Outlets.—The Atlantic seaboard. The Pacific seaboard. The Hudson Bay. The Great Lakes.

The Canadian Society of Civil Engineers represents practically every qualified engineer in Canada. It is with a knowledge of the importance of the subject and of how easily great mistakes, causing enormous waste of money, can be made, that your memorialists have approached the subject, in the hope that you may see fit to grant such a Royal Commission to the end that our common country may be benefited.

The Blacksod Bay Atlantic Route.—Discussing the proposed short route across the Atlantic via Blacksod Bay, Ireland, the Shipping World draws attention to the fact that passengers dislike very much the trouble and annoyance of any transshipment, and American and Canadian travellers are not likely to take kindly to a railway journey across Ireland, a steamer passage across the Channel, and another railway journey to their destination. Further, on the reverse journey, passengers will prefer to embark either at Liverpool or Southampton to being subjected to the inconvenience of going direct to Blacksod Bay by train and a coasting steamer. Such a service could not be a success without handling a large amount of cargo, and as Blacksod Bay is so far removed from the large industrial centres, this class of traffic is not likely to be attracted.



Panoramic View Esquimalt and Nanaimo Railway Mechanical Terminal. See opposite page.

Experimental Fireproof Trains.—The Great Western Railway of England has put in service two experimental fireproof trains, each consisting of four cars. The cars are built entirely of steel, and are lighted throughout electrically. Wood has been practically eliminated from these trains. The only wooden construction is the footboard on the outside.

National Transcontinental Railway Car Shops at Transcona.

The first instalment of this article in the last issue described the freight car shop and the passenger car shops, as well as giving a general description of the whole plant, including the locomotive department. The second instalment follows:

The Passenger Car Paint Shop is 87 by 340 ft., of an exactly similar type of construction to the passenger car shop, with concrete sub walls, surmounted by brick walls, spanned by steel trusses. There are four working tracks extending the length of the building, the central ones at 21 ft. centres, and the outer ones 21 ft. centres.

Between each of the outer pairs there is a 2 ft. industrial track. The working tracks have 12¾ ft. doors in each end of the building, with 5 ft. doors for the service tracks. The two service tracks have a cross connection through small turntables, 130 ft. from the west end, leading across to the planing mill, which is immediately to the south.

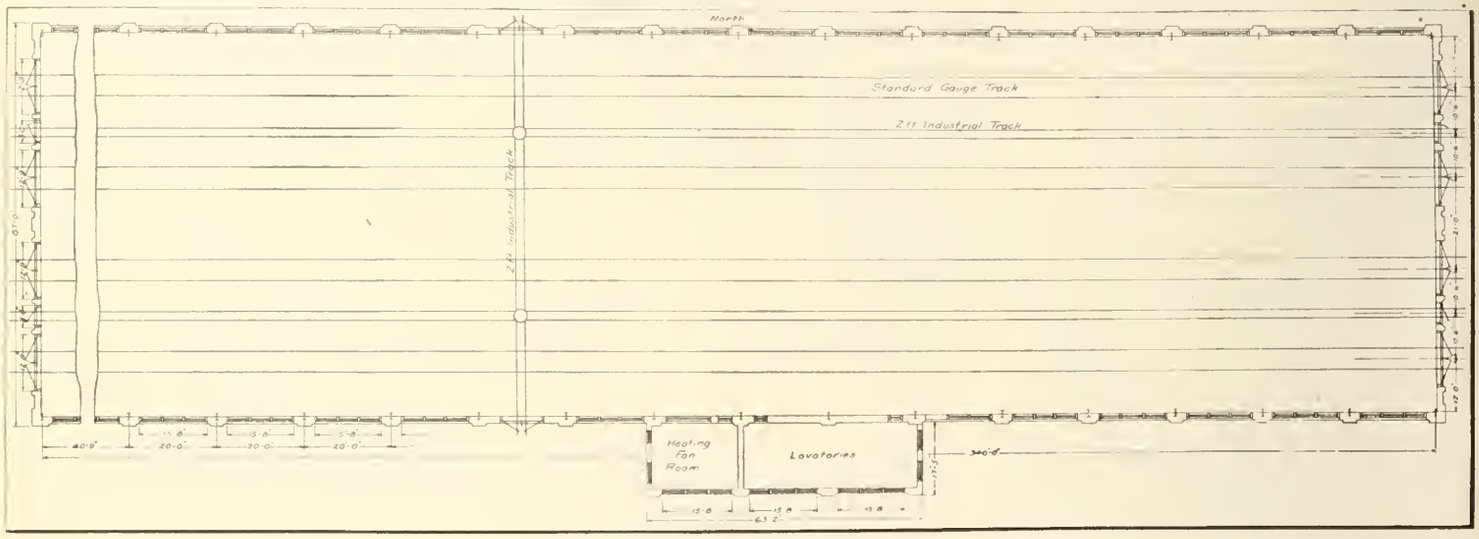


Fig. 6.—Plan of Passenger Car Paint Shop.

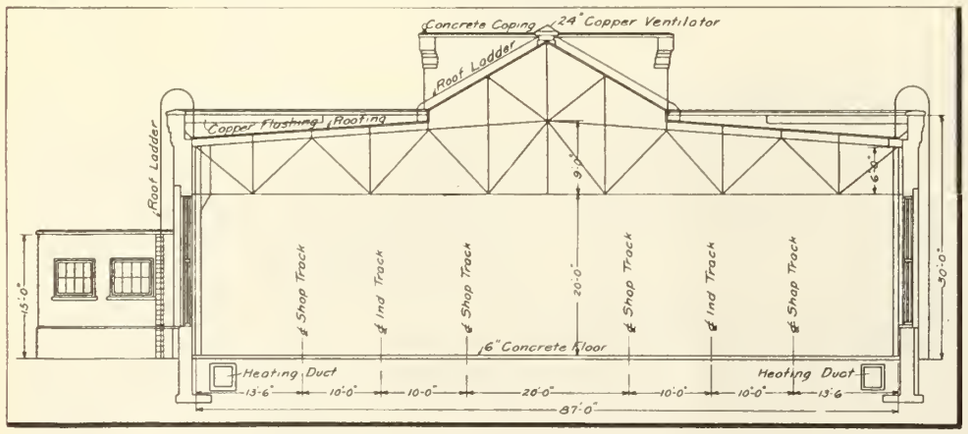


Fig. 7.—Cross Section of Passenger Car Paint Shop.

The shop is divided into 20 ft. sections, cross wise of the shop, by the roof trusses, and in each of these sections there is a large window, providing excellent illumination, in conjunction with the skylights in the monitor roof. The steel roof trusses have a clear 87 ft. span across the shop, and the bottom chord is 20 ft. above the floor. The central depth of the spans is 9 ft., sloping to 6 ft. at the side walls. A monitor, 28 ft. wide, with a depth of 10 ft. above the truss, extends the length of the shop, surmounted by a row of 24 in. copper ventilators, one over each section.

A 17 ft. wide building, 15 ft. high, adjoining the main building near the centre, and extending the length of three shop sections, contains the auxiliary shop facilities, including foreman's office, lavatory and wash room, and the indirect heating plant. A 12 ft. fan connects with a 2½ ft. square concrete duct across the shop, with branch concrete ducts along each wall, all these ducts being under the floor. In the wall under each truss there are outlets. The shop is kept thoroughly drained by traps in the floor, which is of 6 in. concrete. These traps are located at 40 ft. centres along the centre line of each of the working tracks, a 3 in. wrought iron down pipe, connecting with a longitudinal pipe of the same size, to cross pipes, each of which cares for a quarter of the shop. The floor from the wall has a 1 in. drop to the traps, and from the service track to each side, and also from the centre there is a ½ in. drop to the traps.

The Paint Storehouse, 40 by 30 ft. is of the standard construction, with concrete lower walls, carrying brick upperwork, and spanned by steel trusses. It is situated to the rear of the passenger car paint shop, to the north of the lumber sheds. Inside, there is a clear height to bottom of truss of 12 ft. The floor of the building is raised above that outside about 2¼ ft. by a gravel fill, surfaced with 3 in. planking. Along the west and south sides there is a 3½ ft. wide platform, raised 2 ft., for a tank and oil storage stand. In the centre are the dry color bins, putty mixer, grinder, glass rack and pot racks, the latter to the rear of a counter, separated from the east side of the building by an aisle, over which the supplies are served. This counter has a central flap top. A telpher overhead track enters a door on the north side, making a partial circuit of the building and out on the east through a door on that side.

A platform extends along the east and north sides. At the south end on the east side, the platform is at the level of the stores interior, sloping up near the north end to the platform level along the north side, which is at 4 ft. above the ground level, with a 3 in. drain slope towards the outside. The platform width on the east side is 5 ft., and on the north 6 ft. The north side platform adjoins the yard track, and on it will be unloaded all the supplies to be brought into the building through the north door over the projecting overhead track.

The Upholstering Shop is situated in the larger gallery of the east passenger car shop, and is reached from the lower level either by the stairs or by a hoist, as mentioned in the description of that building in the February issue. It contains the following equipment:

Machine for washing bunk curtains, etc., with benzine. Diameter of drum 36 ins., and 50 ins. high.

Extracting machine, with benzine tank and fittings complete, for extracting benzine. Rotary drum 30 by 14 ins.

Washing machine for blankets, etc., 50 by 36 ins.

Rotary extracting machine, with soap and water fittings, 30 by 14 ins.

Soap tank with fittings complete with steam heating coil to boil soap water for washing and extracting machine. Drum 3½ ft. by 30 ins.

Steam box, 18 by 11 by 7 ft., with steam coil at back, and sliding doors at front, for drying blankets.

Steam table to steam edges of blankets, with copper steam pipe attached to one side of 9 by 6 ft. table.

Frames to stretch blankets, 9 ft. by 6 ft. 8 ins.

Stretching tables for frames, operated by compressed air.

Feather renovating machine, to renovate and clean feathers in connection with two feather bunks, 8 by 6 ft.

Hair picking machine.

Benzine tank for 500 gals. Bowser equipment.

Electric cutter.

The Planing Mill, 100 by 300 ft., is of the

standard construction, with concrete lower walls, surmounted by brick masonry and spanned by steel trusses. It adjoins the passenger car paint shop, to which it is very similar in design, and abuts on the midway, the second building from the north end. The roof structure is carried on through steel trusses spanning the building at 20 ft. centres. The central depth of the span is 10 ft., sloping to 7 ft. at the side walls. A 20 ft. monitor, 8 ft. deep, extends the length of the building, surmounted by a 24 in. copper ventilator over each section. There is a clearance of 20 ft. below the lower chord of the truss and the floor. The latter is composed of 3 in. pine, nailed to 4 by 6 in. sleepers bedded in 6 ins. of bituminous concrete.

Slightly west of the centre of the building, along the south wall, there is a lavatory room, 40 by 15 ft., and 10 ft. high, containing the usual lavatory conveniences, including lockers, etc. On a platform surmounting this room is the heating fan, reached by a ladder at one end. The heating duct from the fan passes down through one end of the lavatory room to a cross tunnel under the building, from which heating ducts branch off under the floor along each wall, with headers midway in each section.

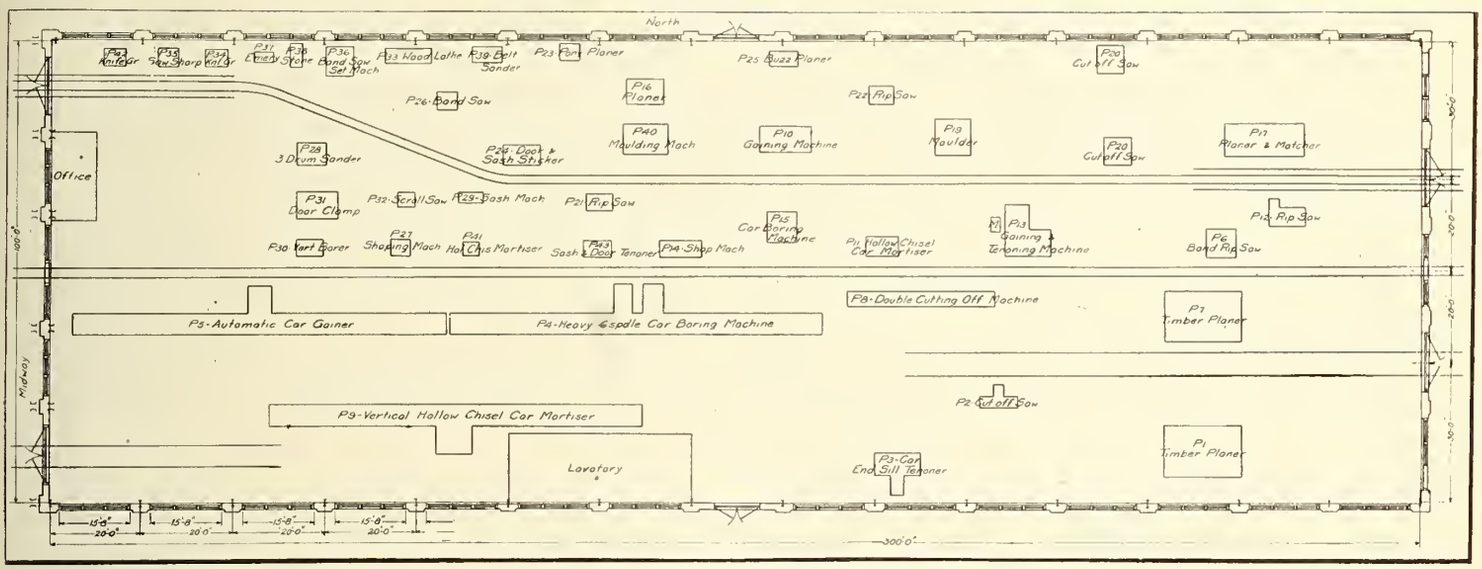


Fig. 8.—Plan and Machinery Location of Planing Mill.

The machine equipment of the building is most complete, and is as follows:

P1. Timber planer. Capacity up to 20 by 16 ins. Feed from 40 to 100 ft. per min. Floor motor driven.

P2. Automatic railway cutoff saw. Table 8 by 2 ft. To cut 12 by 16 ins. 36 in. saw. Floor motor driven.

P3. Vertical automatic car sill end tenoner. Single, double, or triple tenons without reversing timbers. Arranged with variable speed automatic power feed to 13 in. cutter heads with range for working 16 in. square timbers. Three 13 in. heads.

P4. Standard heavy six spindle car boring machine. Two universal and four vertical spindles with hand table feed, combined with extra range vertical hollow chisel car mortiser. Power table feed working to a 40 ft. travelling steel timber table. Boring capacity for 4 in. bits and 14 in. square timbers. Mortiser with adjustable chisel ram, direct geared feed and quick reverse, 18 in. stroke and 16 in. cross adjustment of tool plunger. Mortiser capacity for 3 in. square chisels and 18 by 20 in. timbers to 10 in. deep. Self contained countershaft arranged for motor drive with flexible motor couplings.

P5. Extra heavy automatic car gainer. Power table feed mechanism. 40 ft. travelling steel timber table. Roller stands, timber rolls, layout stops and ratchet clamps. Variable speed automatic feed to head with cross travel for timbers 24 by 21 ins. 16 in. gainer head with 2 to 4 ins. expansion. Motor driven.

P6. Automatic band rip saw. 5 in. blade ripping 28 ins. between saw and fence, and 14 ins. under guides. 8 in. power driven feed rolls with 48 by 46 in. table. Feed 20 to 120 ft. per min. Flexible coupling motor driven.

P7. Timber planer and sizer. Planer capacity to 20 by 16 in. timbers. 40 to 100 ft. per min. feed. Floor motor driven.

P8. Double automatic railway cutoff saw. Capacity 34 ins. wide, to cut 14 ins. by 12 ft. long. 36 in. saws. Floor countershaft with flexible coupling motor drive.

P10. Leclair gaining machine. Flexible countershaft, direct motor driven.

P11. Extra range vertical hollow chisel car mortiser. Universal boring attachment, with adjustable chisel ram and stationary timber bed. Capacity up to 18 by 20 ins., with 2½ in. square chisels. Countershaft with flexible couplings, motor driven.

P12. Large car rip saw. Capacity to rip 14 ins. thick with 36 in. saw. 82 by 52 in. iron table. Motor driven.

P13. Leclair combined gaining and tenoning machine. Heavy universal car tenoner for single, double or triple tenons, with gap frame to work 14 in. high timbers. Gaining attachment. Motor driven.

P14. Two spindle shaping machines. Spindles 26 in. centres. Knives drop below surface. Table 40 by 58 ins. Motor driven.

P15. Medium three spindle car boring machine. Capacity up to 2½ in. diam. and 14 in. deep. 3 fluted timber feed rolls connected to hand wheel, and one wedge screw clamp quick acting spindle carriage adjusting levers. Arranged for 14 in. bits and 12 in. wide timber. Complete set of bits 7-16 to 2 ins. Motor driven.

P16. Cabinet smoothing planer. Capacity from 1-16 to 6 ins. thick, by 30 ins. wide. Spring pressure feed roll control. Feed speeds from 15 to 40 ft. per min. Motor driven.

P17. Double cylinder four sided planer and matcher. 15 ins. wide and 6 in. opening with 3 pairs of 10 in. feed rolls, 6 bit round top and bottom cylinders, high speed steel cutters, 12 bit matcher heads, jointing attachment for all heads, and power driven grinder for top and bottom heads. Profiling attachment with jointer and grinder for same. Feed up to 200 ft. per min. Motor driven.

P18. Automatic railway cutoff saw. Saws up to 24 ins. Saw projection of 7½ ins. and cutting 22 ins. wide. Power feed to saw with foot control with three speeds of forward and quick return. Motor driven.

P19. Heavy four sided inside or outside moulder. 15 by 6 ins., cylinders to be of crucible steel forgings, to be four sided and to be slotted on each side. Four 9 in. rolls with spring pressure for feed. Motor driven.

P20. Automatic railway cutoff saw. To cut 20 ins. wide by 4 ins. thick, with table 66 by 23 ins. Power feed stroke with foot control adjustable to 20 in. length or less, with three speeds forward and quick return cushioned by air cylinder. Motor driven.

P21. Improved standard rip saw. To rip 16 ins. to inside flange and 22 ins. to outside flange. 22 in. saw to cut 7 ins. thick. Table, 72 by 39 ins., and to have parallel lift of 5 ins. and arranged for use of gang saws or cutter heads on the mandril. 16 in. saw. Motor driven.

P22. Improved standard rip saw. To rip 16 ins. inside flange and 22 ins. to outside flange. Saw to cut 7 ins. thick. 70 by 36 in. iron table, to have parallel lift of 5 ins. by screw and bevel gears, with self locking adjustable ripping fence and arranged for use on gang saws or cutter heads on the mandril. 16 in. saw. Motor driven.

P23. Pony planer. Single cylinder 24 ins. wide, opening 6 ins., with two pairs of gear driven feed rolls, cylinder fitted with two knives and belt on each end. Motor driven.

P24. Combination door and sash sticker. Boring and grooving attachments. Top, bottom and outside arbors with ploughing and boring attachments on each square head. Knives, grooving saws, boring bits. Motor driven.

P25. Buzz planer. Cylinder 24 ins. wide, slotted on four sides, fitted with two knives. Table faced with steel plates next to cutter head. Cutter head vertical adjustment. Motor driven.

P26. 36 in. special band saw. To take 15 in. stock below doors, and equipped with safety doors. 29 by 33 in. table. Motor driven.

P27. Two spindle shaping machines. 26 in. centres, one piece frame. Knives capable of dropping below surface. Table 40 by 58 ins. Motor driven.

P28. Three drum sander. Drums 61 ins. wide. Paper applied spirally. Brush cylinder on finished work. Power hoist for upper feed roll frame. Change gears for variable

speed control. Reverse gear. Motor driven.

P29. Sash mortising and relishing machine. Routing and wedge cutting attachment. Two hollow chisels and bits, relishing bit and head with knives, tool holders, stops and layout gauges. Routing bit, with blind router, five saws with door relishers, and two with wedge cutters. Motor driven.

P30. Single spindle vertical borer. Universal table and gear driven head, two speeds. Bits up to 2 in. diam. and 12 in. twist. Bits 3-8 to 1½ in. Motor driven.

P31. Heavy door clamp. For doors, sashes or blinds. Up to 4½ ft. wide rails, 9 ft. 4 ins. long. 12 clamp dogs and end clamp bar, foot release lever.

P32. Scroll saw. 36 in. square table, with central 8 in. diam. cast iron plate. The strain to be raised or lowered for thicknesses up to 12 ins. Pump to blow dust away. Motor driven.

P33. 20 in. double end wood lathe. Large face plate for back of headstock. Floor stand and rest for large diameters. Centres and chucks. Belt driven from line shaft.

P34. 30 in. knife grinder. Carriage has automatic feed and stop and water pump. 24 by 1½ in. emery, wet or dry. Belt driven from line shaft.

P35. Circular saw sharpener. To sharpen cross cut saws from 6 to 44 ins., rip saws 12 to 59 ins. Square or bevel teeth. Belt driven from line shaft.

P36. Band saw filing and setting machine. Sticking attachment. Belt driven from line shaft.

P37. Double emery grinder. Two 12 in. emerys, respectively 1 and ½ in. faces Belt driven from line shaft.

P38. Grindstone. 60 by 8 ins. Trough. Belt driven from line shaft.

P39. Belt sander. Capacity 5 ft. 2 ins. by 42 ins. by 18 ins. Motor driven.

P40. Four sided extra heavy moulding machine. Frame built up from plain cast iron bed plate. Table working by screw working on ball bearings. Feed consists of an under and two upper driving rolls, and controlled through a friction clutch for starting and stopping. Feeds from 15 to 60 ft. Motor driven.

P41. Hollow chisel mortiser. Compound angular table for making mortises at an angle with the face of the stock. Chisels ¼ to ¾ in. square, 23 in. stroke. For material 5½ by 6 ins. Motor driven.

P42. Automatic knife grinding machine. Automatic travel of slide, screw cross feed variable in taper at will, water attachment with pump.

P43. Sash and door car tenoner. Carriage wide and long, moving on roller bearings. To cut tenons 7½ ins. long at one pass. Motor driven.

All shapers, rip and cross cut saws and buzz planers are equipped with patent safety guards, to minimize danger of operating to the mechanics. Machines P10 and P13 are special gaining machines invented by A. Leclair, millwright in the G.T.R. Montreal car shops. Machines of his design, in use in the different G.T.R. car shops, have been described in these columns recently.

The north portion of the mill contains all the smaller wood working machinery, all the machines being served by a 2 ft. industrial track extending through the building. Entering the building from either end, in line with the industrial track, there is a standard gauge track, over which the timber may be brought into the shop in car lots for machining, and be reloaded for shipment if required. It will be observed that the location of the machinery is open in its nature, allowing ample space for manipulating the smaller timber members without interference. The machines are so arranged with regard to each other as to facilitate the sequence of operations.

The heavier and larger members are handled in the south section of the shop, between which and the other section there is an industrial track, running the length of the shop along its centre line. From both ends there are standard gauge tracks entering the building, the west one 50 ft. long, and the east one 100 ft. long, used for the same service as in the former instance. The machinery in this section is so arranged as to give a continuous movement of the members through the shop. The principal parts handled in this section will be the side and end sills. These will enter from the west, passing through the planers, the end sills passing through the tenoner, and side sills through the mortiser. Thence they will pass to the boring and mortising machines, completing the series of operations at the west end, where they can be loaded on cars on the standard gauge track.

The proximity of the planing mill to the passenger car and freight car shops makes for a rapid handling of the material from the mill to the assembling shops. The material from the stock sheds to the rear of the mill passes through the latter, coming out at the midway end completely machined, with practically no retrograde movements in that shop, thence across the midway to either the passenger car or freight car shops. The wood working machinery used principally on passenger car work is grouped for the most part in the northwest portion of the mill, where it is handy to the passenger car shop. The open space in that portion of the mill is an assembly floor for the fine fittings.

The Lumber Shed is to the rear and in line with the planing mill. It is a purely frame building, 60 by 165 ft., and is spanned by wooden trusses at 15 ft. centres, being also divided into three 20 ft. longitudinal bays by supporting columns. The wall intervening columns are all 8 in. square timbers, extending to a height of 17 ft. above the ground, the lower end encased in concrete and sunk to a depth of 4½ ft. The wall framing consists of 2 by 4 in. studding at 2 ft. centres, with 6 by 1 in. cross brace,

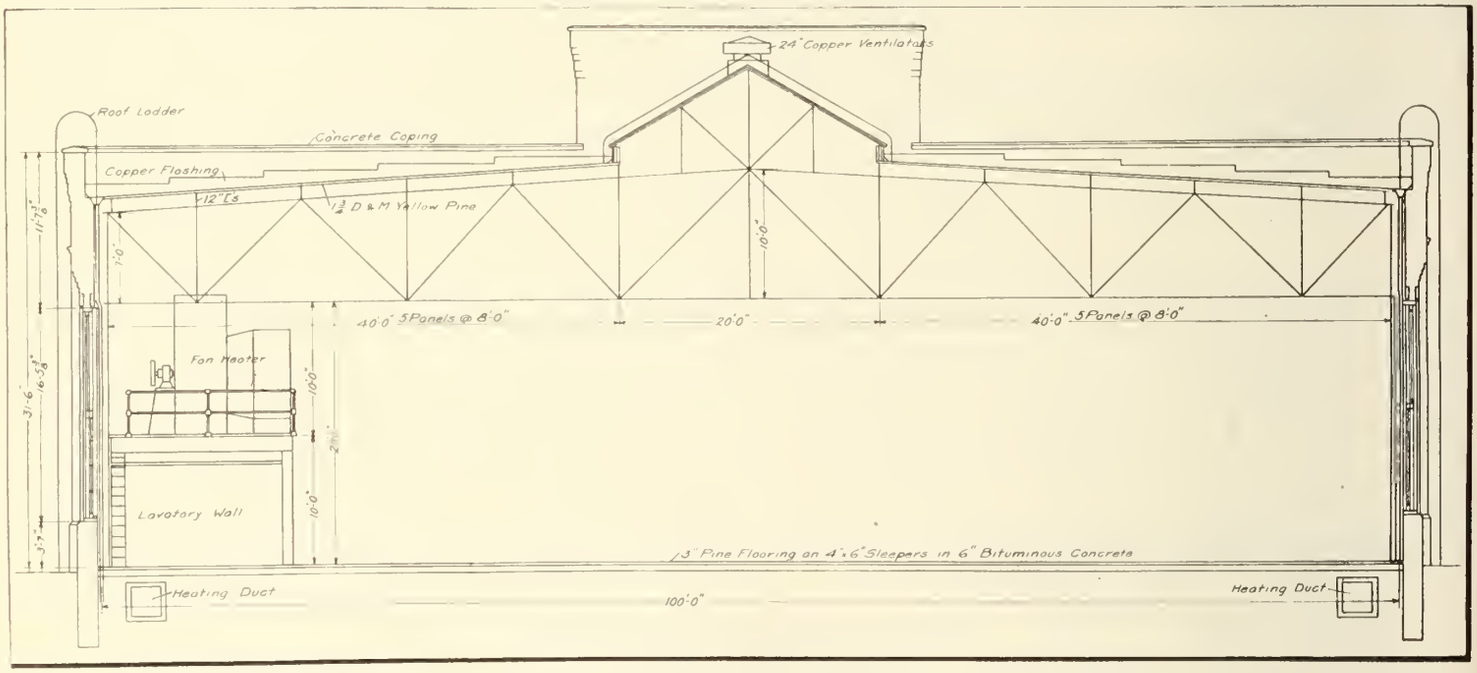


Fig. 9.—Cross Section of Planing Mill.

the outside covered with 1 in. sheathing. The roof trusses consist of a lower 6 by 10 in. member, with 4 by 6 in. bracing, and 6 by 8 in. stringers. The roof is covered with 1¾ in. sheathing, covered with prepared roofing. In every other section, there are two 6 by 10 in. skylights in the roof, one in each side.

Through the centre of the shop there extends a standard gauge track for bringing in and taking out the stored lumber. The dimensions of the building are such that most of the lumber may be stored at right angles to this central track, from cars on which it can be unloaded.

The Dry Kiln is contained in a brick and concrete building, 40 by 50 ft., to the southeast of the planing mill, near the lumber shed, in length from east to west. Through the centre there is a concrete separating wall, dividing the kiln into two separate sections. Each section contains two 4 ft. 11 in. tracks, at 9 ft. centres.

The side and dividing walls each contain a 2 in. air space, inside of which there is a 4 in. wall to the kiln interior, with a 9 in. wall to the outside. The dividing wall has this thickness each side of the air space.

In the ends of the buildings, each half has two double doors opening outwards. The roof slopes from the central dividing wall towards the sides, with a height of 11 ft. 4 ins. at the centre, and 9 ft. at the side walls. The roof consists of 4 ins. of reinforced concrete. This is carried on 12 in. I beams spanning each section, at 10 ft. centres, with two intervening 8 in. I beam stringers in each section. The wall over the end doors is supported on a through 12 in. I beam, spanning the full width of the building.

Each end of the kiln is served by a transfer table, operating in pits 80 ft. long, located 10 ft. beyond the end of the building. These pits are 5 ft. wide and 1 ft. 7½ ins. deep, with a 2 ft. gauge track extending the length of the pits, in the bottom. Lumber can be loaded from the adjoining yard tracks to kiln cars carried on the transfer tables, passing in at one end, and, when dried, out at the other.

The foundations of the building are of concrete, carried down to a safe depth. The floors of the kiln, and the portion of the yard in front of the building ends, and extending to the concrete transfer pits, are of 6 in. concrete, with a ¾ in. cement finish.

The control cabinet for the heating control apparatus is a small leanto, 3 by 2 ft., with the outer wall 2 ft. high, sloping up to the kiln wall at the west end. The control cabinet is of concrete and covers a concrete chamber 2 ft. deep, which contains the pipe connections. The roof of the cabinet is hinged at the top to make the interior accessible from the outside only. This hinged roof consists of two thicknesses of tongued and grooved pine, fitted diagonally, with a 1-8 in. sheet of asbestos between, the whole covered with galvanized sheet iron. Inside the cabinet, at a height of 12 ins. above the ground level, or 3 ft. above the bottom of the pit, there is a floor, through which project the control valve wheels and gauge connections.

Through the bottom of the control cabinet pit, the steam and return connections with the power house pit are made, steam entering in a 4 in. main, and the return through a 3 in. main. Inside the pit both divide, one for each kiln room, the steam passing through the walls in 3 in. mains, and the return in 2½ in. mains. Along the inside wall of that end of the kiln rooms there is a concrete pit, 15 by 18 in., extending the width of each room, the mains from the control cabinet passing along this pit, the steam main on the bottom of the pit, and the return carried on the side wall of the pit. Each room is divided into 7 units of heating pipes, which consist of 2 in. pipes laid on the floor of the room, extending the full length, the condensation passing out to the return main at the far end, and thence back to the pit. The heating units consist, four of 3 pipes, two of 5 pipes, and one of 10 pipes, making 32 heating units of 2 in. pipe, each about 45 ft. long. Each end header is connected from the steam main by a 2½ in. connection. The control cabinet contains valve wheels for both steam and return for both rooms, and also a recording thermometer for each room mounted on a side wall, and pressure gauges mounted on the floor. On the rear wall there is carried the electrical control apparatus for the interior lighting.

This article will be concluded in our next issue.

With saturated steam, the average maximum horsepower is reached at a piston speed of 700 ft. per min., remaining constant up to 1,000 ft. per sec., then slightly decreasing; with superheated steam, it is reached at 1,000 ft. per min., remaining constant for greater speeds.

Birthdays of Transportation Men in March.

Many happy returns of the day to:—

W. G. Annable, General Passenger Agent, C.P.R. Atlantic Steamship Lines, Montreal, born at Ottawa, Mar. 3, 1875.

John Archibald, Locomotive Foreman, C.P.R., Coquitlam, B.C., born at Edinburgh, Scotland, Mar. 13, 1872.

C. H. Bowes, Assistant General Passenger Agent, C.P.R., Vancouver, B.C., born at Bangor, Me., Mar. 22, 1877.

George Bury, Vice President, C.P.R., Winnipeg, born at Montreal, Mar. 6, 1866.

Allan Cameron, Superintendent, Land Branch, Department of Natural Resources, C.P.R., Calgary, Alta., born near Owen Sound, Ont., Mar. 14, 1864.

Frank Clark, Locomotive Foreman, Canadian Northern Ry., Radville, Sask., born at Cowes, Isle of Wight, Eng., Mar. 20, 1884.

F. G. J. Comeau, General Freight Agent, Dominion Atlantic Ry., Halifax, N.S., born at Meteghan River, N.S., Mar. 10, 1859.

W. A. Cooper, Manager, Sleeping, Dining and Parlor Cars and News Service, C.P.R., Montreal, born there, Mar. 22, 1871.

A. E. Cox, General Storekeeper, Canadian Northern Ry., Winnipeg, born at Huddersfield, Eng., Mar. 12, 1863.

Hon. N. Curry, President, Canadian Car and Foundry Co., Montreal, born in King's county, N.S., Mar. 26, 1851.

C. T. Delamere, Assistant Engineer of Construction, C.P.R., Montreal, born at Brainerd, Minn., Mar. 18, 1881.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co., Montreal, and President Canadian Electric Railway Association, born at Montreal, Mar. 4, 1876.

G. R. Fairhead, District Freight Agent, Canadian Northern Ry., Hamilton, Ont., born at Toronto, Mar. 6, 1882.

W. T. Fitzmaurice, Assistant Superintendent, Moncton and Ste. Flavie District, Intercolonial Ry., Newcastle, N.B., born at Bedford, N.S., Mar. 19, 1870.

C. Forrester, Superintendent, Stratford Division, Ontario Lines, G.T.R., Stratford, born at Wanstead, Ont., Mar. 5, 1876.

C. O. Foss, M. Can. Soc. C.E., District Engineer, National Transcontinental Ry., St. John, N.B., born at Wentworth, N.H., Mar. 20, 1852.

H. M. Gain, Trainmaster, Districts 6 and 7, Belleville Division, Eastern Lines, G.T.R., Belleville, Ont., born at Lindsay, Ont., Mar. 21, 1879.

R. A. Gamble, Assistant General Yardmaster, C.P.R., Winnipeg, born at Dublin, Ireland, Mar. 1, 1876.

H. W. Gays, General Manager, Ottawa and New York Ry., Ottawa, Ont., born at Brant, Erie Co., N.Y., Mar. 21, 1848.

E. P. Goodwin, Inspecting Engineer, National Transcontinenal Ry., Ottawa, Ont., born at Baie Verte, N.B., Mar. 17, 1865.

J. Halstead, Division Freight Agent, C.P.R., Calgary, Alta., born at Bracebridge, Ont., Mar. 2, 1877.

R. M. Hannaford, M. Can. Soc. C. E., Assistant Chief Engineer, Montreal Tramways Co., Montreal, born there, Mar. 22, 1865.

C. A. Hayes, General Traffic Manager, Canadian Government Railways, Moncton, N.B., born at West Springfield, Mass., Mar. 10, 1865.

H. T. Hazen, M. Can. Soc. C.E., Mackenzie, Mann & Co., Toronto, born at Truro, N.S., Mar. 14, 1870.

Joseph Hobson, M. Can. Soc. C.E., Consulting Engineer, G.T.R., Hamilton, Ont., born at Guelph, Ont., Mar. 1834.

J. I. Hobson, Treasurer, Canada Steamship Lines, Ltd., Montreal, born at Guelph, Ont., Mar. 30, 1872.

N. J. Holden, President, The Holden Co., Ltd., Montreal, born at Nobleton, Ont., Mar. 22, 1866.

A. R. Holtby, Master of Bridges and Buildings, Mountain Division, G.T.P.R., Prince Rupert, B.C., born at Rawdon, Que., Mar. 23, 1859.

Frank Lee, M. Can. Soc. C.E., Principal Assistant Engineer, C.P.R., Winnipeg, born at Chicago, Ill., Mar. 7, 1873.

R. W. Long, Division Freight Agent, G. T. R., Hamilton, Ont., born at Appin, Ont., Mar. 20, 1873.

T. W. Lowe, General Boiler Inspector, C.P.R. Western Lines, Winnipeg, born at Montreal, Mar. 30, 1858.

J. M. McKay, Superintendent, District 1, British Columbia Division, C.P.R., Revelstoke, born at Tiverton, Ont., Mar. 13, 1868.

Owen McKay, M. Can. Soc. C.E., Chief Engineer, Essex Terminal Ry., Walkerville, Ont., born in Ross tp., Renfrew co., Ont., Mar. 13, 1848.

Sir Donald D. Mann, Vice President, Mackenzie, Mann & Co., Ltd., and First Vice President Canadian Northern Ry., Toronto, born at Acton, Ont., Mar. 23, 1853.

H. H. Melanson, General Passenger Agent, Canadian Government Railways, Moncton, N.B., born at Scadouc, N.B., Mar. 9, 1872.

J. V. Murphy, District Passenger Agent, C.P.R., Nelson, B.C., born at Bowmanville, Ont., Mar. 5, 1885.

C. B. Mutchler, Signal Engineer, G. T. Pacific Ry., Winnipeg, born at Pine Island, Minn., Mar. 8, 1879.

Peter Paton, Assistant Operating Superintendent, Passenger Steamers, Canada Steamship Lines, Ltd., Toronto, born at New Lowell, Ont., Mar. 13, 1869.

R. Patterson, Master Mechanic, G.T.R., Stratford, Ont., born at Brantford, Ont., Mar. 13, 1860.

F. W. Peters, General Superintendent British Columbia Division, C.P.R., Vancouver, born at St. John, N.B., Mar. 25, 1860.

E. H. Sewell, City Passenger Agent, C. P. R., Sherbrooke, Que., born at Quebec, Line, Montreal, born at Kingston, Ont., Mar. 21, 1855.

W. Y. Soper, Vice President, Ottawa Electric Ry. Co., Ottawa, Ont., born at Oldtown, Me., Mar. 9, 1854.

E. F. L. Sturdee, Assistant District Passenger Agent, C.P.R., Toronto, born at St. John, N.B., Mar. 29, 1876.

G. W. Vaux, General Agent, Passenger Department, Union Pacific Rd., Chicago, born at Montreal, Mar. 21, 1866.

A. T. Weldon, General Freight and Passenger Agent, Black Diamond Steamship Line, Montreal, born at Dorchester, N.B., Mar. 6, 1876.

D. O. Wood, General Freight Agent for Ontario, Allan Line Steamship Co., Toronto, born at Kleinburg, Ont., Mar. 16, 1864.

The grate surface required for saturated steam locomotives is the horsepower divided by 30, and for superheated steam locomotives, the horsepower divided by 36.9.

F. Stockdill, Interlocking Inspector, C.P.R., Montreal, in remitting his renewal subscription for Canadian Railway and Marine World, writes: "Please find enclosed subscription for your valuable paper."

An evaporation of 10 lbs. of water per hour per sq. ft. of outside heating surface may be obtained from 2¼ in. tubes 18 ft. long, and 55 lbs. per sq. ft. of firebox heating surface.

It is estimated that about 10% of all motive power is normally out of commission, undergoing repairs. As about 2% of these repairs can be handled with locomotive house facilities, there ought to be main shop accommodation for 8 stalls per 100 locomotives belonging to the line.

Railway Statistics for 1912-13.

Following is an abstract of the railway statistics for the year ended June 30, 1913, as prepared by J. L. Payne, Comptroller of Railway and Canal Statistics:—

Operative mileage increased during the year by 2,576 miles, bringing the total up to 29,304. This was the largest increase in the history of Canadian railways. The growth of mileage by ten year periods is shown in the following table:—

1863	2,189	1893	15,005
1873	3,832	1903	18,988
1883	9,577	1913	29,304

The mileage in operation in 1913, with the increase for the year, was distributed by Provinces as follows:—

	Miles.	Increase.
Nova Scotia	1,360	2
Prince Edward Island	279	10
New Brunswick	1,545	...
Quebec	3,986	103
Ontario	9,000	454
Manitoba	3,993	473
Saskatchewan	4,651	897
Alberta	2,212	316
British Columbia	1,951	96
Yukon	102	...
In United States	225	225
Total	29,304	2,576

There was during the year an addition of 232 miles to double track, bringing the total up to 1,984, and 786 miles to yard track and sidings. The aggregate of all tracks was 38,223 miles—an increase over 1912 of 3,594.

It was definitely ascertained that 18,647 miles of new line were under construction on June 30, 1913. On June 30, 1912, there were 8,826 miles in process of being built; so that the increase in 1913 over 1912 was 9,821. This construction wor was distributed as follows:—

Alberta	4,733
Saskatchewan	4,007
Manitoba	872
British Columbia	3,884
Ontario	2,977
Quebec	1,518
New Brunswick	544
Nova Scotia	112
Total	18,647

The various stages of construction were: Surveyed, 6,560 miles; under contract, 8,651 miles; completed, 2,956 miles, and in operation, although not officially accepted, 542 miles.

During the year a careful and judicial revision was made of the capital statement. Duplication and extinguished liability had been carried along for many years. The revision led to the elimination of $157,000,000 of stocks and bonds, and left the total in force on June 30, at $1,548,256,796. This was divided as follows:—Stocks, $759,645,016; consolidated debenture stock, $163,257,224; bonds, $625,354,356. Since the process of deletion cut out more liability than was added during the year, there appears a small reduction in the total for 1913 as compared with 1912.

The cost of Government owned and operated railways, representing 2,131 miles of line, reached a total of $126,930,887 in 1913. This is not included in capitalization.

Dividends on stocks amounted in 1913 to $33,670,651. In 1908 the volume of dividends was $12,955,243; so that the increase within that period was equal to 160%.

The amount of cash subsidies paid during the year was $9,758,085, distributed as follows:—By the Dominion, $9,176,234; by the provinces, $554,500; by municipalities, $27,350. The additions brought the total account on June 30 up to the following:—By the Dominion. $163,251,469; by the provinces, $36,500,015; by municipalities, $18,078,324. Guarantees by Governments of principal and interest of bonds increased by $29,890,229 during the year. The guarantee account on June 30 stood as follows:—

Dominion	$ 95,486,590
Manitoba	24,059,447
Alberta	45,489,000
Saskatchewan	33,735,000
Ontario	7,860,000
Nova Scotia	5,022,000
British Columbia	59,262,072
New Brunswick	3,654,265
Quebec	372,000
Total	$274,960,374

In addition, and representing a form of aid heretofore unknown in railway statistics, the Dominion Government purchased in 1913 bonds of the Grand Trunk Pacific to the amount of $8,214,934.

The statement of land grants to railways stood on June 30, as follows:—By the Dominion, 31,864,074 acres; by the provinces, 18,692,974 acres.

Passengers carried, 46,230,765; tons of freight carried, 106,992,710. There was an increase over 1912 of 5,106,584 in the number of passengers carried, and of 17,548,379 in the number of tons of freight hauled. These were the largest increments for any year on record. The growth of passenger and freight traffic, by five year periods, is shown in the following table:—

	Passengers.	Freight. Tons.
1878	6,443,924	7,883,472
1883	9,579,984	13,266,255
1888	11,416,791	17,172,759
1893	13,618,027	22,001,599
1898	18,444,049	28,785,903
1903	22,148,742	47,373,417
1908	34,044,992	63,071,167
1913	46,230,765	106,992,710

The average number of passengers per train was 62, and the average passenger journey was 71 miles. The average number of loaded cars per freight train was 18. The average train load was 342 tons, and the average carload was 19.01 tons. There has for seven years past been a steady improvement in both carload and trainload. The average freight haul was 216 miles, which is the longest in the world.

Gross earnings for 1913 aggregated $256,702,703, compared with $219,403,753 in 1912. The increase of $37,298,951 was considerably the largest of any year. In addition, $24,588,410 was earned by Canadian railways in 1913 from outside operations, making a final total of $281,291,113. These outside operations, however, do not constitute any part of the account except as regards net corporate income in the striking of a balance for the year. The rise of gross earnings is as follows: 1883, $33,244,586; 1893, $52,042,396; 1903, $96,064,526; 1913, $256,702,703. The increase in 1913 over 1912 was equal to 17%, and the increase for the last ten year period was 167%.

Gross earnings per mile of line for the past 30 years have been as follows: 1883, $3,471; 1893, $3,468; 1903, $5,059; 1913, $8,751.

The sources of gross earnings in 1912 and 1913 were:—

	1912.	1913.
Passenger service	$ 65,048,187	$ 74,431,994
Freight service	149,961,140	177,089,373
Station and train privileges.	1,086,687	1,566,721
Telegraphs, rents, etc.	3,307,739	3,614,615
Total	$219,403,753	$256,702,703

Passenger earnings were equal to 1.976c. per passenger per mile, and freight earnings equal to .758c. per ton mile. Operating expenses in 1913 were $182,011,690, against $150,726,540 in 1912. While earnings increased 17% over 1912, operating expenses increased 20.7%. The distribution of operating expenses in 1912 and 1913 was as follows:—

	1912.	1913.
Way and structure	$31,514,098	$35,933,323
Equipment	29,811,510	37,289,718
Traffic expenses	5,293,700	6,143,201
Transportation	78,969,544	96,688,264
General expenses	5,137,688	5,957,184
Total	$150,726,540	$182,011,690

The steady increase of operating expenses per mile of line for the past thirty years is shown as follows: 1883, $2,578; 1893, $2,440; 1903, $3,554; 1913, $6,204.

The difference between gross income and operating expenses in 1913 was $74,691,013, which is popularly regarded as net earnings. After making proper deductions, however, the actual net corporate income for the year was $57,523,127, which included profits of $6,698,787 from outside operations.

Following was the situation with respect to equipment on June 30, 1913:—

	Number.	Increase.
Locomotives	5,119	635
Cars in passenger service	5,696	750
Cars in freight service	182,221	41,303
Cars in company's service	15,526	5,060

Not only were these substantial additions made to rolling stock, but for the most part the increase consisted of larger and heavier

Accidents.

The movement of trains in 1913 resulted in the killing of 710 persons and the injury of 2,966. In addition, 32 persons were killed and 1,606 injured from other causes than the movement of trains. Of the killed from all causes, 41 were passengers, 324 were employes, and 418 were classified as "others." Of the injured, 667 were passengers, 3,407 were employes, and 498 were "others." One passenger in every 1,216,559 was killed, and one in every 71,124 was injured. This was a comparatively low record in respect of fatal accidents; but the proportion of injured passengers was high.

The number of employes increased by 22,751 in 1913, bringing the total up to 178,652. Salaries and wages amounted to $115,749,825, as compared with $87,299,639 in 1912.

The C.P.R. Staff Record Office at the general offices, Montreal, which is in charge of A. Rondeau, has a staff of 16 men. There are over 80,000 personal records of officials and employes, giving date of birth, particulars of service, etc., which are kept on cards, contained in some 350 boxes. The pension records are kept in the same office.

Canadian Transfer Co.—Following are the directors for the current year, who were re-elected at the recent annual meeting at Montreal:—C. Cassils, Hugh Paton, G. R. Starke, Sir H. Montagu Allan, and F. W. Molson. F. M. McRobie is General Manager and Secretary.

The Toronto, Hamilton and Buffalo Ry. put in operation the electric automatic block signal system between Hamilton and Welland, Ont., recently. A similar system will probably be installed between Hamilton and Brantford, Ont., during the current year.

J. E. Beatty, Division Engineer, Construction Department, C.P.R., Montreal, writes Canadian Railway and Marine World: "I attach hereto money order to cover my subscription to your satisfactory publication."

Lachine Bridge.—P. B. Motley, Engineer of Bridges, C.P.R., read a paper on the St. Lawrence Bridge at Lachine, Que., before the Canadian Society of Civil Engineers in Montreal, Feb. 5.

The Minister of Public Works stated in the House of Commons recently, in connection with the Dominion Government telegraph line between Athabasca Landing and McMurray, that the line is completed to Duncans Creek, 57 miles, beyond which point the right of way has been cleared for a further 42 miles to 20 miles south of Pelican Rapids. Construction was commenced June 5, 1912, and $27,004.43 has been spent. No officers have yet been established along the line.

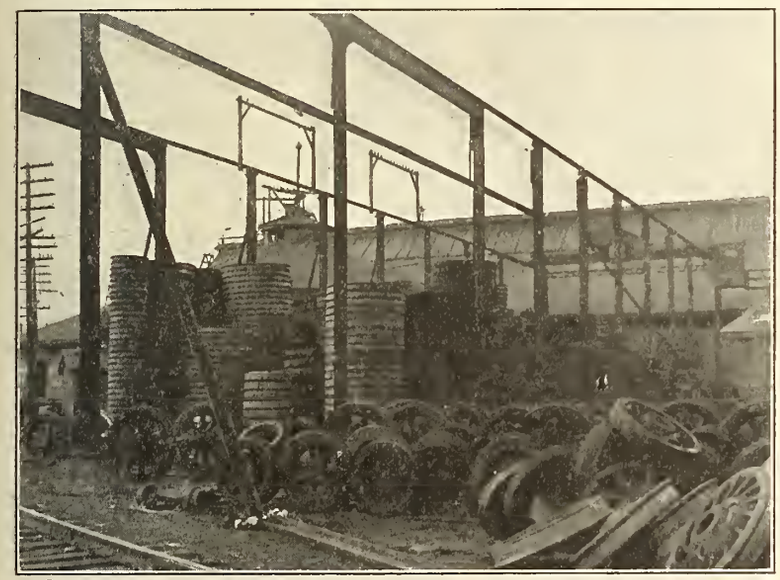
Railway Mechanical Methods and Devices.

Locomotive Tire Storage, Grand Trunk Railway Montreal Shops.

The storing of material around shops and yards in a systematic manner, so that it may be readily got at as required, with the least disturbance of other stored material, is one of the many important problems presented around every shop. The storage of the small parts is well looked after by the stores department officials, but it is not possible to always adopt their methods where materials larger than they are in the habit of handling in the usual manner are involved.

Around a locomotive shop, where repairs are handled, locomotive tires come under the list of those parts requiring most frequent renewal. In the G. T. R. Montreal locomotive shops, the problem of storing these tires, using a minimum of space, made necessary by the cramped condition of the shop grounds, has been effectively solved as shown in the accompanying illustration, of the tire storage yard, just outside the main shop door. Instead of standing them on their rims against a supporting wall, which requires a considerable amount of room, vertical piling has been resorted to, all tires of a size being piled in one tier. The storage area is boarded over, presenting a level surface on which to pile, so that a considerable height can be used.

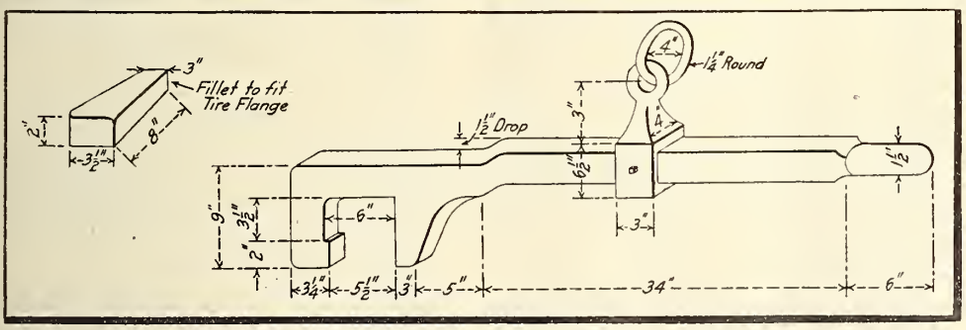
Spanning the tire storage yard, there is a light electric crane, carried on old bridge columns. The crane is operated from a suspended cabin overhanging the outside of the track. The tires are carried down the storage space, and can be dropped directly on the cars at the far end to be run into the shop to the right for machining, or to the left to the circular building shown, for tire mounting. The locomotive truck storage space is shown to the right. It communicates with a service track along the row of crane columns.



Locomotive Tire Storage, Served by Electric Crane.

Clamp for Lifting Tires.

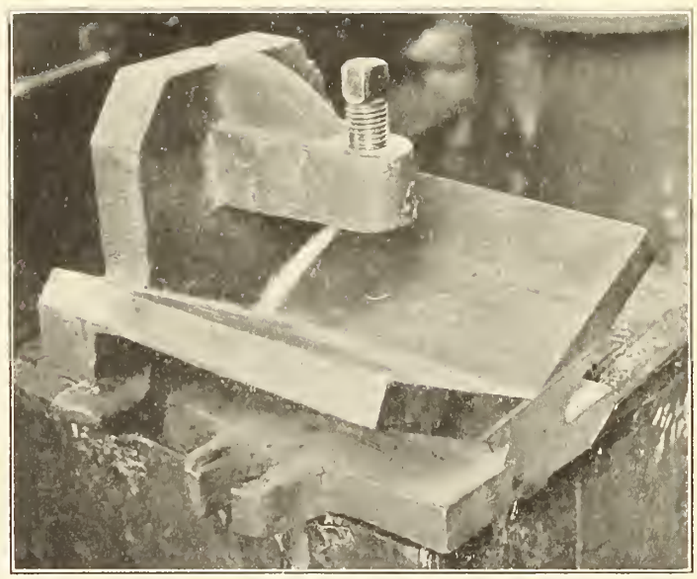
The accompanying illustration shows a very convenient form of clamp used in lifting locomotive tires in and out of the boring mill, on the St. Louis and San Francisco Rd. It consists of a heavy forged bar, with a cut out jaw on one end like a heavy spanner. The inner face of this cut out is square with the body of the forging, and fits up against the inner surface of the tire to be lifted. The other face of the jaw slips loosely over the tire flange, a taper pin driven in between this face and the flange and tread rigidly securing the whole. A collar fits over the arm of the bar, secured in the desired position by a set screw. The upper face of the collar is forged with a lifting eye. This collar is made adjustable in order that it may be slipped along the bar to centre the lifting ring over the centre of the tire so that the whole tire is balanced. This information is abstracted from the Railway Age Gazette, mechanical edition. The whole principle is very similar to the lifting hook arrangement in use at the C. P. R. Angus shops, Montreal, for lifting axles in and out of the lathe so as to avoid the central driving head. It is said that this clamp makes a quick fastening.



Clamp for Lifting Tires.

Facing Brasses at Quebec Central Railway Shops.

A very useful jig for facing brasses is in use in the Quebec Central Ry. shops, at Sherbrooke, Que. Brasses, from the very nature of their shape, are more or less awkward to handle in the machine, and especially when held in a vise are they difficult to line up. This jig is extremely simple, consisting of a V shaped casting, with a flat base, to be bolted to the shaper table, and at the back of the V space, there is a vertical shoulder, with a lug projecting horizontally therefrom, containing a set screw, for clamping the work in place. The base of the jig has an aligning rib planed in its surface, so that all that is required to set up the job, is to set the jig on the table, bolt it down, and then place in the brass, which is secured by the upper set screw. Both sides are open and free to be operated on by the shaper tool. The Q. C. R. shops are in charge of G. M. Robins, Master Mechanic, with E. M. Green, General Foreman Machine Shop.



Jig for Facing Brasses.

Tempering Long Taps at Grand Trunk Railway Montreal Locomotive Shops.

In the handling of long taps during the tempering process, it is usually necessary for the blacksmith to have the use of a lathe, in which to place the tap to ascertain whether the heating has caused it to bend slightly, in which case it is customary to bend the tap back to its correct alignment by prying up under the bent section, with the tap still retained between the lathe centres. The objection to this method is that a lathe must be taken out of useful service, which quite frequently involves the idleness of the lathe operator during this period as well.

A special system of handling this work has been evolved in the G.T.R. Montreal locomotive shops, where the care of taps is in charge of R. Pike, Foreman Toolmaker.

A steel tank, 18 ins. diam. by 8 ft. long, is sunk into the ground, with only the upper 2 ft. above the floor level. Across the top of this tank there is a frame carrying a bearing bracket vertically, in which a long brass spindle is carried, this spindle being of such a fit that it may be raised or lowered. On the lower end of this spindle there is attached an offset arm, with an upwardly projecting centre. An adjustable arm of similar design is secured on the upper length of the spindle, but may be adjusted in position by means of a clamp. The centre on this arm projects downwards. It is a sliding fit in the arm, and is held in its lowest position normally by a coiled spring around the lower part of the centre, bearing against a head on the end of the latter.

An oil furnace heats the tap to the requisite temperature, when it is removed, and the tank spindle raised and the tap placed between centres, these latter being first adjusted to the length of the tap to be tempered. Between these centres the tap can be revolved and its truth determined. If out of true, it can be removed for straightening. This is accomplished by the device attached to the cover of the adjacent oil box. A flat loop of bar stock is bolted to the cover of the box and a roller placed in front of the loop. By the combined use of the loop and roller the tap can be bent at any desired place and then replaced between the centres for verification. Once true, the whole supporting vertical spindle is lowered into the tempering bath, with which the tank is filled, where it is kept as long as necessary. This vertical spindle is counterweighted by a weight, and in consequence moves freely. Any length of tap up to 7¾ ft. can be treated. The whole equipment can be placed in the corner of the tool room, out of the way of the general work, and away from the lathes.

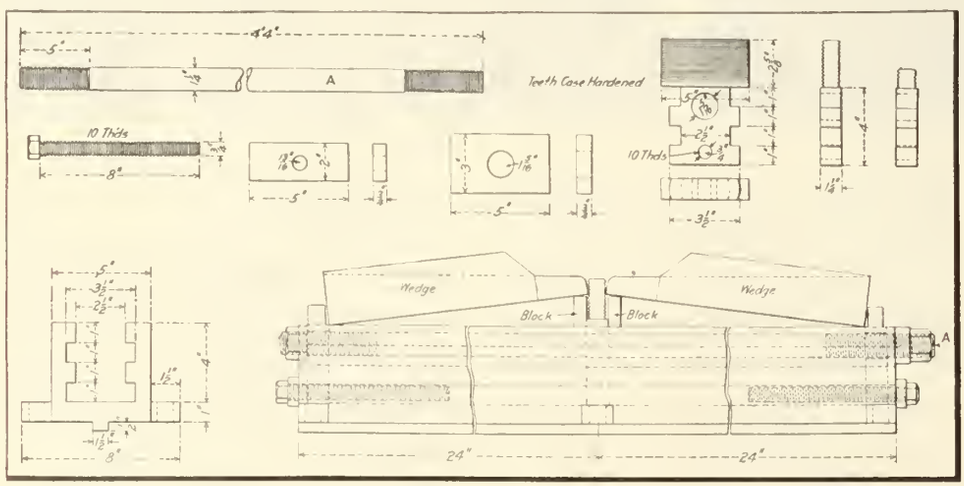


Fig. 1.—Chuck for Holding Shoes and Wedges for Planing

Planing Shoes and Wedges.

The practice of the Central of Georgia Ry. in the planing of shoes and wedges is somewhat similar to that in the C. P. R. and C. N. R. shops at Winnipeg, especially with regard to the use of the gang tool for the planing. The chuck and combination tools employed are shown in figs. 1 and 2, the combination being such that both frame fit and the outside of the flanges may be planed in one operation. The chucks are made in 4 ft. sections, and as many as possible are placed end for end on the planer, and if the latter has two heads, a double row is possible. The tool used is shown in fig. 2. The shoes are clamped by tightening the nut A on the chuck rod, holding them tight enough to take off any cut. The end jaws are adjusted in and out by the bolts, which are threaded in the bottom of the jaw. Four sections of the chuck will hold from 8 to 11 shoes. It is said that by the use of this combination, the cost of machining per shoe has been reduced to 4 cents.

The outside angular tools are adjusted to the outside dimensions of the shoe, and the inside tool is made in one piece to the size and shape of the frame fit. A further tool,

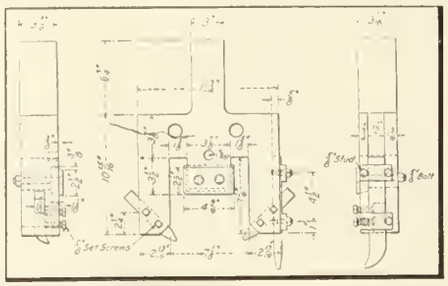


Fig. 2.—Gang Tool for Planing Shoes and Wedges.

¾ by 1½ in. is attached to the outside of the tool holder and is used to plane out the bottom of the shoes or wedges, thereby removing the sand and scale, preparatory to entering the sizing tool. Thus all operations are accomplished in the one setting, and at one operation. The foregoing is abstracted from the Railway Age Gazette, mechanical edition.

Terms and Definitions for Yard Tracks, Canadian Northern Railway.

Following are the terms used by Mackenzie, Mann and Co.'s engineering department, Toronto, for yard tracks, with their definitions, for which we are indebted to A. F. Stewart, Chief Engineer of Construction, and H. E. B. Smith, Engineer of Yards and Terminals:—

AUXILIARY.—For storing plough or wrecking train.

BLIND.—Stub end for storing cars.

BODY.—Each of the parallel tracks of a yard upon which cars are switched and stored.

DOUBLE.—Two main tracks upon each of which the current of traffic is in a specified direction, and upon the other in the opposite direction.

FAN TAIL.—Stub end for storing cars.

HOUSE.—A track alongside of, or entering, a freight house, and used for cars receiving or delivering freight at the house.

HUMP YARD.—Switching cars by gravity; track passes over a mound so as to rise to a summit.

INCLINE.—An inclined track, or tracks, on a river bank at a protected landing place with adjustable apron and cradle, for connecting to the track on a car float, for transfer of cars.

INDUSTRIAL.—A track serving one or more industries.

IN GOING.—For use of locomotives into roundhouse.

LADDER.—A track connecting successively, the body tracks of a yard.

LEAD.—An extended track connecting either end of a yard with the main track.

LOOP.—For turning trains.

MAIN.—A track extending through yards and between stations, upon which trains are operated by timetable or train order, or the use of which is controlled by block signals.

OUT GOING.—For the use of locomotives from roundhouse.

OVERFLOW.—Intended for use in case the distribution tracks become filled.

POLING.—Switching by pole method.

RELIEF.—An extended siding long enough to allow an inferior train to continue running.

RUNNING.—A track reserved for movements through yard.

SIDING.—A track auxiliary to the main track for meeting, or passing, trains, limited to the distance between two adjoining telegraph stations.

SINGLE.—A main track upon which trains are operated in both directions.

SORTING.—For arranging the cars of a train in station order.

SPUR.—A stub track of indefinite length diverging from the main line.

STORAGE.—Hold for order cars.

STUB.—A track connected with another at one end only.

SWITCHING OR SHUNTING LEAD.—A track connecting with groups of sidings to enable shunting to be carried on without running out on the main line.

TEAM.—A track where freight is transferred direct between cars and wagons.

THREE OR MORE.—Main tracks upon any of which the current of traffic may be in either specified direction.

TRANSFER SLIP.—A protected landing place for car floats with adjustable apron or bridge for connecting the tracks on the land with those on car float.

Y.—A triangular arrangement of tracks used for turning locomotives, cars, or trains.

SPECIAL.—In a typical yard there will be several tracks devoted to special purposes, varying with local conditions. These will include caboose tracks, scale and coaling tracks, ashpit tracks, sand tracks, icing tracks, feed tracks, stock tracks, transfer tracks, depressed tracks, etc.

The C.P.R. Pension Fund, which was established in 1903, has now 605 men on its payment list, 73 being under 60 years of age, 294 between 60 and 70 and 238 over 70. The payments last year aggregated $169,326, all of which is borne by the company, the men contributing nothing. No pension is less than $20 a month.

Tests have shown that economy results from the better utilization of the coal in the modern locomotive than in the older types, as the range of temperatures at which the locomotive works, that is, the difference between the temperature of the furnace and of the stack with the long tube locomotive is greater.

In a locomotive boiler, the distance from the water level, measured at the top gauge cock to the outside of the largest course, equals the diameter of the largest course multiplied by 0.15.

Steam Railway Statistics for Year Ended June 30, 1913.

In the following table the column headed gross earnings includes passenger and freight earnings, as well as miscellaneous earnings; the latter not being shown separately; the next four columns give the operating expenses classified under their various headings, while the last gives the net earnings, which are arrived at by deducting the totals of the four columns referred to from the figures in the gross earnings column. The minus mark (—) before figures in the net earnings column shows that there was a deficit in the operations of the line to the extent of the figures given. The numbers in brackets—thus (1)—after the name of the railway refer to notes on page 116. The cents have been omitted in all cases, and the figures in the totals show the aggregate earnings, etc., including the cents, omitted from the detailed items.

Name of Railway	Mileage	Passenger Earnings	Freight Earnings	Gross Earnings	Maintenance of Way and Structures	Maintenance of Equipment	Traffic and Transportation Expenses	General Expenses	Net Earnings
Algoma Central & Hudson Bay	133.77	$ 49,718	$ 287,511	$ 538,580	$ 102,997	$ 56,433	$ 139,212	$ 33,837	$ 206,060
Algoma Eastern	30.70	3,497	118,660	128,999	8,102	24,114	14,827	27,621	55,334
Atlantic, Quebec and Western	104.50	24,009	17,859	41,906	13,882	29,876	7,015	39,656	—48,520
Bay of Quinte	86.00	46,993	200,092	257,271	40,647	46,674	123,854	9,874	36,220
Bedlington & Nelson	12.04	323	1,821	2,146	5,897	710	810	835	—6,089
Bessemer & Barry's Bay	5.00	.....	.....	.....	.....	.....	.....	.....	.....
Brandon, Sask. & Hudson Bay	69.45	31,146	44,787	76,136	45,594	13,678	53,744	4,695	—41,576
British Yukon	101.12	68,367	254,499	326,348	24,863	10,239	50,584	12,658	226,001
Brockville, Westport & N.W.	45.00	38,582	37,758	76,447	18,410	3,265	26,198	3,273	25,297
Bruce Mines & Algoma	17.28	.....	.....	.....	.....	.....	.....	.....	.....
Canada & Gulf Terminal	35.80	18,878	22,719	42,139	6,937	5,512	17,843	5,432	6,413
Canada Southern	380.04	3,475,158	7,472,737	10,996,494	914, 823	1,143,921	3,445,712	173,554	5,318,482
Canadian Government Railways—									
Intercolonial	1,462.48	4,037,531	8,206,110	12,349,296	2,150,119	3,141,980	6,934,814	283,398	—161,015
Prince Edward Island	279.23	198,218	180,592	390,461	144,767	88,278	263,162	16,528	—122,275
Canadian Northern	4,670.65	4,358,829	18,568,177	24,277,478	3,224,929	3,133,932	10,120,105	672,493	7,126,016
Canadian Northern Ontario	500.15	375,637	871,607	1,280,524	333,609	165,092	678,230	53,280	50,310
Canadian Northern Quebec	371.02	404,776	1,160,487	1,599,546	346,867	200,363	778,296	59,818	214,199
Canadian Pacific	11,507.80	39,587,535	88,770,594	130,769,707	18,498,741	17,198,573	49,451,279	2,571,349	43,049,763
Carillon & Grenville	13.00	.....	.....	.....	.....	.....	.....	.....	.....
Caraquet	84.78	22,036	51,125	72,161	20,409	7,234	30,868	6,229	8,418
Cape Breton	31.00	5,950	4,743	11,283	6,202	1,909	9,785	3,493	—10,107
Central Ontario	149.73	117,938	241,866	375,048	72,581	22,820	138,327	9,292	132,023
Crows Nest Southern (1)	74.18	24,315	202,456	226,720	94,045	29,981	91,424	8,377	3,890
Cumberland Ry. & Coal Co.	32.00	18,220	92,275	110,799	24,021	19,528	44,326	3,068	19,845
Dominion Atlantic	279.67	438,402	537,419	984,497	178,799	88,165	379,079	35,747	302,705
Eastern British Columbia	16.00	4,413	50,082	54,610	7,935	3,811	14,053	1,116	27,693
Elgin & Havelock	28.00	3,914	9,388	13,498	5,149	2,485	4,764	883	216
Esquimalt & Nanaimo	152.00	363,070	549,133	931,892	159,697	154,648	274,303	5,064	338,177
Essex Terminal	10.00	.....	45,846	47,683	12,206	1,645	12,744	1,284	19,802
Grand Trunk	3,103.91	13,522,284	26,437,660	40,424,397	4,050508	6,401,438	16,524,465	980,760	12,467,223
G. T. R., Canada Atlantic	456.26	547,998	1,788,234	2,382,258	461,599	390,798	1,358,352	65,839	105,708
Grand Trunk Pacific	1,395.77	1,604,527	6,410,792	8,162,204	1,362,157	2,174,127	3,569,646	169,581	886,711
Halifax & South Western	378.46	245,966	281,423	531,338	185,007	48,004	272,932	22,272	3,121
Hereford	52.18	21,338	67,422	89,756	35,080	23,375	61,453	4,605	—34,759
International of New Brunswick	112.00	42,117	69,137	111,932	19,462	11,049	43,589	4,996	32,833
Inverness Ry. & Coal Co.	60.91	25,503	189,208	213,824	36,024	25,059	52,071	7,283	93,384
Irondale, Bancroft & Ottawa	51.00	9,627	20,213	30,384	9,513	1,304	11,488	1,661	6,416
Kent Northern	27.00	9,121	12,862	21,083	6,793	1,505	7,931	1,645	4,108
Kingston & Pembroke (2)	.....	41,144	96,713	134,338	32,296	17,033	49,304	7,134	28,599
Kettle Valley	22.20	542	2,921	3,464	1,686	.....	1,710	419	—352
Klondyke Mines	31.81	4	110,179	110,189	22,955	4,371	30,855	13,793	38,213
Lake Erie & Detroit River (Pere Marquette)	198.81	193,623	2,486,154	2,689,475	278,251	452,367	898,200	64,139	996,515
London & Port Stanley	23.66	38,334	107,421	146,571	23,778	28,820	104,780	6,913	—17,722
Lotbiniere & Megantic	30.00	6,195	28,651	34,870	9,216	4,195	8,327	6,225	6,905
Magnetawan River	1.91	.....	.....	.....	.....	.....	.....	.....	.....
Manitoba Great Northern	91.77	7,297	58,728	66,376	85,353	13,529	42,650	4,126	—79,284
Maritime Coal, Ry. & Power Co.	15.00	7,628	60,459	68,087	12,818	3,661	21,544	2,034	28,029
Massawippi Valley	35.46	71,391	193,156	265,791	52,120	44,190	142,096	10,386	16,907
Midland of Manitoba	6.40	205,196	245,670	467,550	40,062	30,099	267,045	12,791	117,552
Montreal & Atlantic	163.40	237,481	845,570	1,104,926	323,528	129,827	508,595	31,521	101,453
Montreal & Province	58.60	78,276	64,828	145,066	42,705	7,194	57,859	2,018	35,289
Montreal & Vermont Jct.	23.60	67,478	61,225	128,808	18,810	16,868	42,440	5,118	45,569
Moncton & Buctouche	32.00	12,113	18,014	30,805	8,498	2,229	10,340	2,663	7,073
Morissey, Fernie & Michel	10.85	12,342	140,354	152,696	19,063	35,946	56,882	21,821	18,982
Maine Central	5.10	12,298	6,238	18,536	2,178	2,498	10,913	642	2,303
Napierville Junction	27.06	6,422	94,650	101,196	8,423	5,534	26,194	1,948	59,094
Nelson & Fort Sheppard	55.42	29,116	50,666	82,723	53,217	8,930	40,742	4,916	—25,084
New Brunswick Coal & Ry. Co.	58.00	13,023	40,428	61,346	23,491	9,828	26,982	14,027	—12,983
New Brunswick & P.E.I.	36.00	12,717	30,636	43,394	7,340	9,176	16,937	2,700	7,240
New Westminster Southern	23.73	11,971	41,847	57,844	12,041	4,012	11,961	2,098	27,729
North Shore	8.63	395	1,571	1,967	235	.....	1,516	27	188
Nosbonsing & Nipissing	5.50	.....	.....	.....	.....	.....	.....	.....	.....
Ottawa & New York	56.90	88,350	124,364	218,220	56,187	22,587	103,419	8,737	27,286
Phillipsburg Ry. & Quarry Co.	6.00	.....	.....	.....	.....	.....	.....	.....	.....
Pontiac & Renfrew	4.25	.....	.....	.....	.....	.....	.....	.....	.....
Quebec Central	253.00	439,471	1,118,312	1,571,150	201,808	175,222	661,572	69,347	463,200
Quebec Oriental	100.00	49,077	52,571	101,687	24,631	12,768	51,368	5,602	7,316
Quebec Ry., Light & Power Co.	40.32	13,062	68,037	82,079	9,166	14,021	33,507	8,161	17,121
Quebec & Lake St. John	286.40	312,359	631,546	959,380	175,042	135,100	483,000	43,015	123,220
Quebec, Montreal & Southern	191.91	161,613	233,117	395,466	109,421	81,314	172,134	20,476	12,118
Red Mountain	9.59	2,965	13,800	17,114	12,359	2,577	12,625	964	—12,412
Rutland & Noyan	3.39	9,100	5,443	14,544	3,761	2,621	5,894	675	1,500
Salisbury & Albert	45.00	12,129	24,218	37,010	11,517	4,005	12,872	3,355	5,258
Schomberg & Aurora	14.40	6,045	7,216	13,284	6,192	347	8,733	249	—2,238

(Continued on page 116)

Steam Railway Statistics for Year Ended June 30, 1913 (Continued from page 115)

Name of Railway	Mileage	Passenger Earnings	Freight Earnings	Gross Earnings	Maintenance of Way and Structures	Maintenance of Equipment	Traffic and Transportation Expenses	General Expenses	Net Earnings
Stanstead, Shefford & Chambly	43.00	$ 45,815	$ 56,545	$ 104,669	$ 35,388	$ 10,313	$ 51,463	$ 2,126	$ 4,976
St. Clair Tunnel	1.13	.....	347,821	347,821	13,241	14,993	66,716	1,669	251,200
St. Lawrence & Adirondack	46.12	273,495	406,294	684,681	96,745	23,314	320,816	11,574	232,239
St. Martins	30.00	6,238	8,208	14,787	6,068	827	7,736	1,026	—872
Sydney & Louisburg	68.80	50,304	747,509	818,198	90,314	159,324	261,166	28,699	278,692
Temiscouata	113.00	63,741	181,595	250,769	53,484	27,606	82,232	15,125	72,321
Timiskaming & Northern Ontario	330.78	623,248	886,393	1,569,226	373,106	249,127	692,639	103,290	151,061
Thousand Islands	6.33	14,894	28,857	46,241	9,743	987	15,543	4,171	15,796
Toronto, Hamilton & Buffalo	80.15	448,555	1,358,199	1,826,247	223,185	170,602	548,360	38,816	845,282
Vancouver Copper Co.'s Ry.	12.00	.....	.....	.....	.....	.....	.....	.....	.....
Vancouver, Victoria & Eastern	236.08	282,340	687,375	994,614	375,347	102,076	418,665	33,490	65,035
Victoria & Sidney	15.97	38,153	38,789	78,860	11,578	6,350	30,858	4,168	25,903
Victoria Terminal Ry. & Ferry Co.	0.99	3,165	2,822	6,689	706	402	1,956	279	3,343
Wabash (3)	.....	674,012	1,913,755	2,593,103	275,486	577,258	1,304,986	78,467	356,902
Wellington Colliery Co.	10.75	4,836	79,326	84,162	19,413	26,105	38,643	.....	.....
York & Carleton	10.50	2,052	3,846	5,898	1,031	148	2,348	5	2,364
	29,303.53	$74,431,994	$177,089,372	$256,702,703	$35,933,322	$37,289,718	$102,831,464	$5,957,183	$74,691,012

Notes to Steam Railway Statistics.

1. The Crowsnest Southern gross earnings are less than the whole of the figures given in two preceding columns. The figure given is arrived at by deducting the "Dr. $51.00" in the column in the statistics "other earnings from operation."

2. The Kingston & Pembroke passenger and freight earnings are in excess of the amount in the gross earnings column, which figure is arrived at by deducting $3,519, which is marked "Dr." in the column in the statistical tables giving "other earnings from operation."

3. The Wabash Rd. does not own track in Canada, but operates over the G.T.R. under a lease.

The following lines were not operated during the financial year: Bessemer and Barry's Bay; Bruce Mines and Algoma; Carillon and Grenville; Nosbonsing and Nipissing; Phillipsburg Ry. and Quarry Co.; Pontiac and Renfrew; Vancouver Copper Co.'s Ry.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

21243. Jan. 21.—Ordering C.P.R., G.T. Pacific Ry. and Midland Ry. of Manitoba to prohibit whistling by locomotives in Winnipeg, whistling to be allowed only where deemed necessary to prevent accident, and providing penalty of $50 for every offence against this regulation.

21244. Jan. 20.—Approving Bell Telephone Co. agreement with Tay Tp., Ont., of Dec. 19, 1913, for interchange of telephone messages, etc.

21245. Jan. 23.—Authorizing G.T. Pacific Ry. to carry traffic over portion of its main line in British Columbia, between Fraser River and Prince George, mileage 1189 to 1280.5; speed of trains between mileage 1245 and 1280.5 limited to 15 miles an hour, and over temporary bridges at 3rd and 4th crossings of Fraser River to 6 miles an hour.

21246. Jan. 23.—Authorizing C.P.R. to use bridges 28, 103.9, 40.8, 124.4 and 109.4, Muskoka Subdivision, and across Keele St., West Toronto, Ont.

21247. Jan. 26.—Approving location of Cedars Rapids Mfg. and Power Co.'s transmission line between Cedar Rapids, Que., and Cornwall, Ont.

21248. Jan. 23.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across G.T.R. on Pinnacle St., Belleville, Ont.

21249. Jan. 23.—Amending order 16973, July 9, 1912, re C.N. Ontario Ry. crossing of Montreal Park and Island Ry. at Sault au Recollect, Que., and rescinding order 19956, Aug. 2, 1913, in same connection.

21250. Jan. 26.—Authorizing C.P.R. to build sidings for Fraser, Ltd., at Victoria, N.B.

21251. Jan. 23.—Dismissing application of Princeville village, Que., for order directing G.T.R. to build highway over its tracks, about 1,050 ft. west of station.

21252. Jan. 26.—Authorizing C.P.R. and Algoma Central and Hudson Bay Ry. to operate over crossing at Hobon, Ont., without stopping trains.

21253. Jan. 24.—Relieving C.P.R. from speed limitation of 12 miles an hour on trains over portion of its Swift Current Southeasterly Branch from Neville to Vanguard, mileage 27.5 to 43.6, Sask.

21254. Jan. 26.—Authorizing C.P.R. to build bridges at mileage 59.8, over Findlay Creek, and mileage 46.62, over Skookumchuck Creek, Kootenay Central Ry., B.C.

21255. Jan. 24.—Authorizing City of Toronto to operate its Danforth Ave. car line across G.T.R. spur to Toronto Type Foundry until June 1, pending installation of half interlocking plant.

21256. Jan. 24.—Authorizing C.P.R. to build bridge over Dutch Creek, mileage 75.6, Kootenay Central Ry., B.C.

21257. Jan. 27.—Authorizing G.T.R. to build extension of siding for S. L. Lambert, Welland, Ont.

21258. Jan. 24.—Extending to May 1, time within which G.T.R. shal linstall gates to cover all tracks and sidings at crossing of first highway east of Clarkson, Ont.

21259, 21260. Jan. 28.—Authorizing until further order the City of Montreal to lay steel water pipe under C.P.R. Lachine Canal South Bank Branch and G.T.R.

21261. Jan. 22.—Extending to June 1, time within which Cumberland Ry. and Coal Co. shall equip its cars with automatic couplers and air brakes.

21262. Jan. 28.—Authorizing Ottawa Electric Co. to erect wires across C.P.R., on road north of Hurdman's Bridge, mileage 6.64 from Sussex St. Station, Ont.

21263. Jan. 28.—Extending to May 31, time within which C.P.R. shall complete siding for McCormick Mfg. Co., London, Ont., authorized by order 20710.

21264. Jan. 28.—Approving C.P.R. plan of bridge 94.4, Toronto Subdivision.

21265. Jan. 29.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across Front St., Belleville, Ont., at grade.

21266. Jan. 24.—Approving C.N. Ontario Ry. revised location at Grand Lake, Nipissing District, mileage 126.37 to 129.94 from Ottawa.

21267. Jan. 28.—Relieving C.P.R. from providing further protection at crossing of first highway east of Sheho station, Sask.

21268. Jan. 28.—Authorizing Niagara, St. Catharines and Toronto Ry. and G.T.R. to operate over Welland Ave., St. Catharines, Ont., without first stopping cars or trains.

21269. Jan. 28.—Postponing effective dates of Temiscouata Ry. Special Commodity Tariff, C.R.C. 217, and Joint Freight Tariff, C.R.C. 221, increasing rates on pulpwood in carloads, from Jan. 1 and 24 respectively, to Aug. 15, and rescinding order 21105, Dec. 23, 1913, in same connection.

21270. Jan. 30.—Authorizing City of Brantford, Ont., to excavate new channel across island immediately below Holmedale District, where Lake Erie and Northern Ry. has built embankment across old channel.

21271. Jan. 29.—Authorizing Canadian Northern Ry. to build across and divert public road between Secs. 5 and 6, Tp. 41, R. 18, w. 4 m.

21272. Jan. 29.—Relieving Quebec, Montreal and Southern Ry. from maintaining watchman at Chemin de Lac crossing, Boucherville, Que.

21273. Jan. 29.—Rescinding order 21155, which required C.P.R. to stop its train 33, on flag daily, at Claremont, Ont., for three months from Dec. 31, 1913.

21274. Jan. 24.—Authorizing G.T. Pacific Ry. to build across Government Road at mileage 213 and 214, Cariboo District, B.C.

21275. Jan. 30.—Authorizing G.T. Pacific Branch Lines Co. and C.P.R. to operate over crossing of C.P.R. Moose Jaw-Lacombe Branch at Druid, Sask., without first stopping trains.

21276. Jan. 29.—Amending order 20937, Dec. 1, 1913, re G.T. Pacific spur for J. Latimer, Edmonton, Alta.

21277. Jan. 28.—Approving G.T. Pacific Ry. revised location from milcage 3.14 to 5.88, Alberta.

21278. Jan. 28.—Authorizing C.P.R. to build spur for Boyd Pressed Brick Syndicate, in Lot 3, Con. 7, Nassagawaya Tp., Ont.

21279. Jan. 29.—Authorizing C.P.R. to open for traffic, portion of its double track from Islington to Guelph Jct., mileage 9.98 to 39.86, Ont.

21280. Jan. 29.—Authorizing C.P.R. to change grade of its main line across road allowance between Lots 20 and 21, Con. 3, Bathurst Tp., Ont., and to change grade of crossing at mileage 15.44.

21281. Jan. 30.—Approving plan showing proposed crossings over G.T.R. adjoining Front St., Toronto.

21282. Jan. 29.—Authorizing C.P.R. to build spur for Canmore Coal Co., Canmore Alta.

21283. Jan. 28.—Authorizing C.P.R. to build bridge to carry Campbellford, Lake Ontario and Western Ry. (C.P.R.) across Sidney St., Trenton.

21284. Jan. 29.—Relieving C.P.R. from providing further proteotion at crossing of Keewatin St., Winnipeg.

21285. Jan. 29.—Dismissing G.T.R. application for orler amending order 14731, authorizing G.T.R. to rebuild bridge 272, mileage 55.75, Albion Tp., Ont.

21286. Jan. 29.—Approving revised location of Mount Royal Tunnel and Terminal Co. (C.N.R.) tunnel line from St. Antoine St. to junction with main line at Montreal; and rescinding order 20899, Nov. 27, 1913, in same connection.

21287. Jan. 29.—Amending order 15449, Sept. 15, 1911, to provide that Winnipeg Electric Ry. be authorized to build across C.P.R. spur to Winnipeg Industrial Exhibition alongside C.P.R. Winnipeg Beach Branch on Selkirk Ave., Winnipeg.

21288. Jan. 31.—Ordering G.T.R. and Campbellford, Lake Ontario and Western Ry. (C.P.R.) to protect Prince Edward St. at Brighton, Ont., by gates.

21289. Jan. 30.—Ordering that G.T.R. allow no car or locomotive to stand within 50 ft. of east side of crossing of William St., London, Ont.

21290. Jan. 29.—Ordering G.T.R. to provide protection at crossing of first highway east of Hastings station, Ont.; watchman to be on duty from 7.30 a.m. to 7.30 p.m. daily.

21291. Jan. 29.—Authorizing Brampton municipality, Ont., to open up Helstine Ave. across C.P.R.

21292. Jan. 29.—Authorizing C.P.R. to change grade crossing in Don Road, Lot 2, Con. 3, east of Yonge St., York Tp., Ont., and to build additional track at grade across same at mileage 93.65, Toronto Subdivision.

21293. Jan. 29.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plans 55070, Dec. 15, 1913, and 55365, showing overhead highway crossing at mileage 91.7, Murray Tp., Ont.

21294. Jan. 30.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build crossing over its railway for A. Hendricks, in Lot 13, Con. 1, Murray Tp., Ont.

21295. Jan. 31.—Extending to May 1, time for completion of farm crossing for R. V. Ditmars by Dominion Atlantic Ry., in Annapolis County, N.S.

21296. Jan. 2.—Approving Kettle Valley Ry. location from Coquihalla Summit to Hope, B.C., mileage 0 to 39.42, on condition that a 14 deg. curve at mileage 3.2 be change to a 12 deg. curve.

21297. Jan. 29.—Authorizing C.P.R. to take from G.T.R. lands required for right of way in south ½ Lot 12, Con. 1, Hope Tp., Ont., at mileage 127.74 on C.P.R.

21298. Jan. 31.—Authorizing C.P.R. to build foot bridge over repair tracks at North Transcona, Man.

21299. Feb. 3.—Authorizing C.P.R. to rebuild bridge 91.5, Toronto Subdivision.

21300. Feb. 2.—Approving revised location of portion of C.P.R. main line, as built from mileage 29.00 to 32.49, White River Subdivision, Ont.

21301. Jan. 27.—Rescinding order 20893, Nov. 25, 1913, and order 17358, Aug. 27, 1912, in so far as it relieves C.P.R. from erecting fences along its right of way between Savona and Pennys, B.C.

21302. Jan. 30.—Authorizing C.P.R. to build siding for Northern Brick Co., Waters Tp., Ont.

21303. Jan. 30.—Authorizing Canada Southern Ry. to connect with Niagara, St. Catharines and Toronto Ry., near Welland, Ont.

21304, 21305. Jan. 31.—Extending to May 31, time within which G.T.R. shall complete siding for International Harvester Co., Hamilton, Ont., and amending order 20697, Oct. 30, 1913, in same connection.

21306 to 21308. Feb. 2.—Authorizing Ontario Hydro Electric Power Commission to erect transmission line across C.P.R. telegraph wires on West St., Goderich, Ont.

21309. Feb. 2.—Rescinding orders 4406 and 5804, Feb. 27 and Dec. 10, 1908, respectively, and authorizing G.T.R. to terminate lease relating to Hamilton, Waterloo and Guelph Ry. location in Hamilton, G.T.R. to re-take the lands and premises freed from any further recognition of right and privilege created by the lease.

21310. Feb. 4.—Authorizing C.P.R. to build its ballast pit spur at LaFleche at grade across road allowance at mileage 137.07 on its Weyburn-Stirling Branch, Sask.

21311. Feb. 2.—Authorizing C.P.R. to build spur in Medicine Hat, Alta., for Dominion Grocers, Ltd., Moose Jaw, Sask.

21312. Feb. 4.—Authorizing C.P.R. to build its ballast pit spur at Meyronne, Sask., at grade across road allowance at mileage 153.0 on its Weyburn-Stirling Branch.

21313. Feb. 5.—Ordering C.P.R. and G.T.R. to build subway under their double main line at Ste. Anne de Bellevue, Que.

21314. Feb. 4.—Authorizing Canadian Northern Ry. to reduce its daily passenger service each way, excepting Sunday, to a tri-weekly service each way, bet een Kindersley, Sask., and Hanna, Alta., until June 1.

21315. Feb. 4.—Declaring that land applied for by C.P.R. on French River Indian Reserve, Parry Sound District, Ont., is required for railway purposes, and is land which were it the property of private owner could be taken without consent.

21316. Feb. 5.—Extending to June 30, time within which C.P.R. shall complete branch for J. D. Abbott, Balsam Lake, Ont.

21317. Feb. 5.—Authorizing Canadian Northern Ry. to divert public road in s.e. ¼ Sec. 29, Tp. 25, R. 20, w. 3 m., Sesk., and rescinding order 17042, July 16, 1912, in so far as it authorizes crossing of highway between n.e. ¼ Sec. 20 and s.e. ¼ Sec. 29.

21318. Feb. 5.—Authorizing clearances of G.T.R. sidings to Canada Forge Co., Welland, Ont., for 6 months.

21319. Jan. 28.—Authorizing Canadian Northern Ontario Ry. to divert Jane St., at station 1094:32, North Bay, Ont.

21320. Feb. 5.—Relieving C.P.R. from speed limitation of 10 miles an hour over the crossing of King St., Virden, Man.

21321, 21322. Feb. 6.—Authorizing Toronto Eastern Ry. and Oshawa Ry. to operate trains and cars, for 6 months, over crossing to carriage factory, and crossing at Simcoe St., Oshawa, Ont.

21323. Feb. 2.—Authorizing C.N. Ontario Ry. to build spur from its Montreal-Port Arthur Line, Stafford Tp., through Pembroke, with two branches in Pembroke, for the Box Factory, Steel Equipment Co., Pembroke Lumber Co., and local freight of the town and surrounding country; and to cross certain streets in Pembroke.

21324. Feb. 7.—Authorizing British Columbia Electric Ry. to operate over crossing of Esquimalt and Nanaimo Ry., near Russell, B.C.

21325. Feb. 10.—Rescinding order 21286, Jan. 29, 1914, and amending order 20899, Nov. 27, 1913, re revised location of Mount Royal Tunnel and Terminal Co.'s line.

21326, 21327. Feb. 10.—Suspending, pending investigation by Board, supplements 151 and 152 to G.T.R. Tariff, C.R.C. no. E. 2552, published to take effect Feb. 15 and 16 respectively, and advanced rates published in Supplements 40 and 42 to C.P.R. Tariff, C.R.C. no. E. 2559, applying on building brick from Cooksville and Weston, Ont., to Toronto; and on gravel and building sand from Cooksville to North Toronto, Parkdale and Toronto.

21328. Feb. 10.—Authorizing C.P.R. to build spur for Winnipeg Paint and Glass Co., Kildonan Parish, Man.

21329. Feb. 6.—Suspending, pending determination by the Board, increases in switching rates on sand, gravel and brick as from Feb. 15, notice of which is given in Supplements 19 and 20 to G.T.R. Tariff C.R.C. no. E. 2677.

21330. Feb. 9.—Relieving C.P.R. from speed limitation of 15 miles an hour over portions of Weyburn-Stirling Branch between mileage 0 and 52.2.

21331. Feb. 9.—Authorizing C.P.R. to build spur extension for Ontario Stone Corporatioin, North Orillia Tp., at Uhtoff, Ont.

21332. Feb. 4.—Authorizing C.P.R. to take certain lands in Con. 3, Bathurst Tp., Ont.

21333. Feb. 9.—Authorizing C.N. Ontario Ry. to build across C.P.R., near Hurdman's Bridge, Nepean Tp.

21334. Feb. 10.—Rescinding order 17477, Sept. 12, 1912, re C.P.R. road diversion near Berkley Station, Ont.

21335. Feb. 10.—Authorizing C.P.R. to build across road allowance by a bridge between Lots 22 and 23, Con. A, Hamilton Township, mileage 121.29 from Glen Tay, Ont.

21336. Feb. 10.—Authorizing C.P.R. to change present grade crossing in road allowance between Lots 13 and 14, Con. 3, Trafalgar Tp., Ont., and to build additional track at grade across same.

21337. Jan. 29.—Authorizing C.P.R. to build St. Marys and Western Ontario Ry. at grade along Thames Ave. and across Park and Elgin Sts., St. Marys, Ont.

21338. Feb. 10.—Approving location of C.P.R. station at Parsons, B.C.

21339. Dec. 3.—Authorizing Canadian Northern Ry. to build spur for Dominion Gypsum Co., Winnipeg, Man.

21340. Feb. 11.—Relieving C.P.R. from speed limitation of 15 miles an hour over portion of Swift Current Southeasterly Branch from near Swift Current to Neville, Sask.

21341. Feb. 10.—Authorizing C.P.R. to build its Weyburn-Stirling Branch Line at grade across 22 highways, between mileage 277.78 and 298.07, Sask.

21342. Feb. 11.—Authorizing G.T.R. to rebuild bridge 240, over Bear Creek, near Powassan, Ont.

21343. Feb. 9.—Authorizing Canadian Northern Ry. to build spur for Nicholson and Blain, Edmonton, Alta.

21344. Feb. 11.—Amending order 20857, Nov. 19, 1913, to provide that G.T. Pacific Ry. build forthwith a station and platform at Telkwa, B.C., not to be below standard of 1A B.R.C. station.

21345. Feb. 11.—Authorizing C.P.R. to rebuild bridge 18.71, over Battle River, on its Coronation Northwesterly Branch, Alta.

21346. Feb. 11.—Authorizing G.T.R. to rebuild bridge 234, over McCormick's Creek, mileage 43.30, Montreal Division, Que.

21347. Feb. 10.—Approving Supplement 3 to Express Classification for Canada 3, prescribing regulations for shipping live poultry in coops.

21348. Feb. 12.—Authorizing Canadian Western Ry. to open for traffic its line from Drumheller, mileage 314.7 to 396.4, Alta.

21349. Feb. 11.—Ordering Wabash Rd. to stop its train no. 5 at Corinth, Ont., if flagged, on Tuesday, Thursday and Saturday of each week, for 60 days from date.

21350. Feb. 11.—Ordering protection at crossing of Bennett Ave., Maisonneuve, Que., by C.N. Quebec Ry., and Montreal Terminal Ry., by a pair of gates, to be operated by day and night watchmen.

21351. Feb. 12.—Extending to May 15, time within which spur for Renfrew White Granite Co., Ross Tp., Ont., is to be completed.

21352. Feb. 9.—Ordering C.P.R. to appoint permanent agent at Millett station, Alta.

21353. Feb. 12.—Extending to May 21, time within which switching lead in Toronto, be completed.

21354. Feb. 12.—Approving revised location of portion of C.P.R. Columbia and Western Line at mileage 0.45, Granby Subdivision, B.C.

21355. Feb. 12.—Authorizing G.T. Pacific Ry. to carry traffic on portion of its main line east of Prince Rupert, B.C., between mileage 301 and 337.

21356. Feb. 12.—Approving, temporarily, G.T. Pacific Ry. Standard Freight Mileage Tariff, C.R.C. 21, incorporating and superseding C.R.C. 19, by an extension of mileage, to apply between stations between Prince Rupert and Wordsworth, B.C., inclusive.

21357. Feb. 9.—Authorizing Ontario Hydro-Electric Commission to cross C.P.R. wires and track on Main St., Chesterville, Ont.

21358. 21359. Feb. 13, 14.—Approving plan A of G.T.R. bridge 63, at mileage 152.51, from Black Rock, over public road at Golmesville, and authorizing G.T.R. to rebuild bridge 52, at mileage 127.75, from Black Rock, Fullarton Tp., Ont.

21360. Feb. 13.—Authorizing C.P.R. to divert highway in s.e. ¼ of Sec. 26, Tp. 3, R. 29, w 3 m, Sask.; and to build its Weyburn-Stirling Branch at grade across same between Secs. 25 and 26.

21361. 21362. Feb. 14.—Authorizing C.P.R. to divert highway in Secs. 1 and 9, Tp. 23, R. 2, w 4 m., Alta.; and to build its Bassano Easterly Branch Line across same at mileage 111.3 and 114.7.

21363. Feb. 13.—Authorizing C.N. Quebec Ry. to build siding into sand pit at mileage 16.90, west of Joliette, for E. Dupuis, St. Julienne, and to cross public road to Bissonnette, at Station 66+70.

21364. Feb. 13.—Authorizing C.P.R. to build its Swift Current Northwesterly Branch, at mileage 169.89, at grade across Canadian Northern Ry., Goose Lake Branch, at mileage 210.12.

21365. Feb. 13.—Authorizing McKim Tp., Ont., to build highway crossing over Algoma Eastern Ry., in Lot 11, Con. 4.

21366. Feb. 14.—Authorizing C.P.R. to build siding, for Conger Lehigh Coal Co., Toronto, Ont.

21367. Feb. 17.—Amending order 21172, Jan. 7, re C.P.R. double track, by substituting Brandon, Man., for Broadview, Sask.

21368. Feb. 17.—Authorizing Kettle Valley Ry. to carry traffic over portion of line from Penticton Wharf, westerly for 17 miles, and northerly and northwesterly from Carmi to mileage 76.5, 30 miles, in B.C.

21369. Feb. 16.—Rescinding order of Railway Committee of Privy Council of Canada, of Sept. 1, 1899.

21370. Feb. 17.—Authorizing C.P.R. to build spur for Hope & Sons, of Canada, Peterboro, Ont., and rescinding order 2132, Jan. 19, in same connection.

21371. Feb. 17.—Ordering Canadian Northern Ry. to rebuild its station at Aberdeen, Sask., to be completed by July 1.

21372 to 21374. Feb. 17.—Authorizing C.P.R. to build road diversions as follows: At mileage 88.9, Bassano Easterly Branch; in Secs. 2-22, and 34-21; and to build its Bassano Easterly Branch at grade across north and south road allowances between Secs. 2 and 3, Tp. 22, and Secs. 34 and 35, Tp. 7; in Secs. 20-21-8, w. 4 m., Alta., and to build its Bassano Easterly Branch at grade across same at mileage 66.39.

21375. Feb. 17.—Authorizing C.P.R. to carry McGill University mining students at special rate of $40 each from Montreal, to Rossland, Phoenix, and Greenwood, B.C., and return, or at $50 from Montreal to Vancouver, B.C., and return, including side trips to Rossland, Phoenix and Greenwood, and if desired, over lines from Sudbury to Sault Ste. Marie, Ont., and back, at $2.75; and that any other parties desiring to travel for same purpose to B.C. or any other mining district, be granted equally favorable terms, until further ordered.

21376. Feb. 19.—Authorizing C.P.R. to build bridge 62.8 over Magnetawan River, near Byng Inlet, Ont.

21377. Feb. 18.—Authorizing C.P.R. to use bridges 25.7, Laggan Subdivision, Alta.; 92.3, Boundary Subdivision, B.C., and 176.9, Calgary Subdivision, Alta.

21378. Feb. 18.—Including Montreal Warehousing Co. as party to application of Montreal Board of Trade for order directing G.T.R. to put into effect at its Montreal elevator, same charges and conditions for grain as are in force at its Georgian Bay elevators.

21379. Feb. 19.—Authorizing G.T. Pacific Branch Lines Co. to build road diversion in s.w. ¼ Sec. 24-1-3, w. 2 m., Sask., at mileage 151.5 on its Regina-Boundary Branch.

21380. Feb. 19.—Amending order 21161, Jan. 7, re location of Toronto and Niagara Power Co.'s transmission line in Huron and Wentworth Counties, Ont.

21381. Feb. 19.—Amending order 21139, Dec. 31, 1913, re construction of Canadian Northern Ry. culverts at Obelisk, Sask., by substituting Alta., for Sask.

21382. Dec. 12.—Authorizing Canadian Northern Ry. to build across 9 highways on its Alsask Southeasterly Line, Sask.

21383. Feb. 19.—Approving Kettle Valley Ry. location between mileage 19.7 and 27.2, Hydraulic Summit west to Penticton, B.C.

21384. Feb. 19.—Approving C.N. Ontario Ry. revised location and land required for yards, in Ferris Tp., Nipissing District, Ont., mileage 337 to 338.15, from Montreal.

21385. Feb. 19.—Authorizing C.P.R. to use bridges over North Saskatchewan River, at Edmonton, Alta.; 33.9, Edmonton Subdivision, Alta.; over Saskatchewan Ave., and over Jasper Ave., Edmonton, Alta.; 49.4 and 88, Red Deer Subdivision, Alta.

21386. Feb. 19.—Authorizing C.P.R. to build spur for Massey-Harris Co., Yorkton, Sask.

General Order 119. Jan. 31.—Re removing regular station agents from various stations west of Port Arthur. This order is given fully on another page.

General Order 120. Feb. 3.—Amending special tariffs of charges for detention of refrigerator cars when used for shipments of perishable freight, by eliminating clauses relating to detention at points of loading.

The Canadian Railway Club's Annual Dinner, held in Montreal Jan. 30 was more largely attended than any previous one, over 400 being present. R. W. Burnett, General Master Car Builder C. P. R., and President of the Club, was in the chair, and the other speakers were W. McNab, Principal Assistant Engineer, G. T. R.; F. P. Gutelius, General Manager Canadian Government Railways; Cy Warman, General Advertising Superintendent, G. T. R.; L. R. Johnston, General Superintedent, Angus Shops District, C. P. R.; G. A. Post, President Standard Coupler Co., New York; F. D. Adams, Dean of Faculty of Applied Science, McGill University; M. J. Butler, Vice President Armstrong, Whitworth & Co., of Canada; G. Ham, Headquarters Staff, C. P. R.; W. W. Butler, President the W. W. Butler Co., and Vice President Canadian Car and Foundry Co.

A New Logging Railway in B. C.—The Delta Shingle Mill, Churchill, B. C., has, it is reported, arranged to build a logging railway for hauling timber from the Scott road to its mills. The Surrey County Council has granted permission for the building of the line across certain road allowances.

Canadian Northern Railway Terminals at Port Mann.

The Canadian Northern Ry. for one of its Pacific Coast terminals of its transcontinental line now nearing completion, has opened up a tract of land on the Fraser River, about 12 miles from Vancouver, where it is constructing extensive terminal facilities. The site has been named Port Mann, after Sir Donald D. Mann, Vice President. As a part of the general scheme, and as a means of financing the work, the property back from the river, along which the railway facilities will be situated, was secured by the railway as a townsite, was subdivided, and has been on the market for some time. The town layout is of considerable extent, and it is anticipated that with the extensive railway and shipping facilities which will be provided it will become a point of considerable importance.

The Fraser River is navigable up to this point for large, ocean going vessels, and in consequence, it is expected to become a place of importance for the transhipment of freight for the Orient; a possible traffic in the transhipment of grain, etc., by way of the Panama Canal, is another phase of future development. Considering all these viewpoints, the prospect of the place developing seemed so imminent to the railway management, that a well developed scheme for extensive facilities has been undertaken, as shown in the accompanying plans.

The yard accommodation will consist of three yards of equal size, each containing 14 body tracks, 2,800 ft. long in the clear, giving a capacity in each of 1,000 cars, or a total capacity of 3,000 cars. These yards are on the north side of the double track main line, along the river bank. To each end of each yard, there will be two ladder tracks, each of these serving 7 tracks. To the intermediate body tracks, there will be cross overs from the main line. From the west, the westerly ladder tracks will be approached by two 1,600 ft. switching tracks, over which the made up trains may be taken from or into the yards. On the north of the east end of the easterly yard, there will be three caboose tracks, between which and the yard, will be a scale track. To the north of this, a large coal storage space has been reserved.

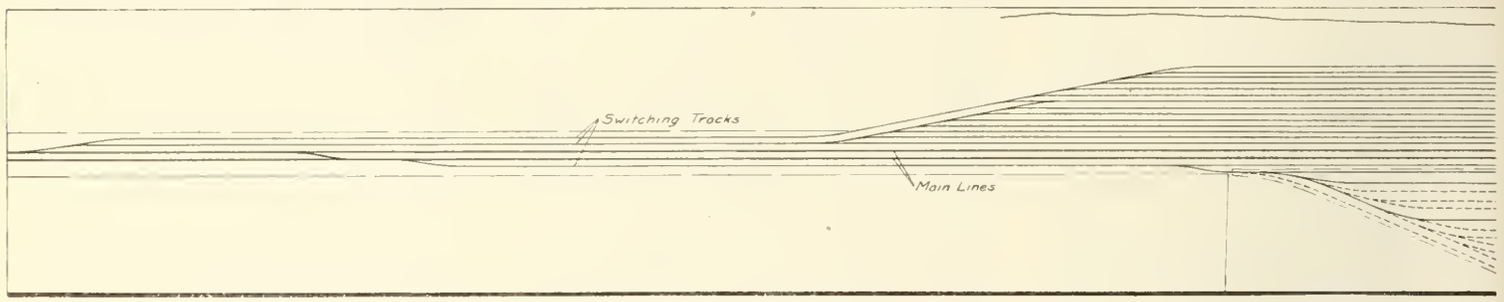
The centre of the projected town will be Bon Accord Square, Centre St. leading directly from the river into it. Stub tracks leading from ladder tracks east and west of this street, will form an extensive system of storage and team tracks; there will be 14 of these to the west, and 7 to the east of the street, the latter being the entry thoroughfare to the teamways. Along the south side of the yards, there will be a service track, from which stub team tracks will branch off, terminating at Railway St., 8 tracks to the west and 4 to the east of Centre St. Immediately to the west of Centre St. there will be 4 local freight tracks, with a freight shed, 40 by 200 ft., abutting on the street. Provision has been made for the extension of this shed to double its original size. The southerly two tracks of the team track layout will be spanned by a transfer crane, with a team scale in the roadway nearby.

Ample accomodation is being made for future warehouses on sites 50 by 100 ft., both to the east and to the west of Centre St. The station will adjoin Centre St. At the foot of Centre St., there has been built a 1,000 by 102 ft. wharf, with freight storage shed adjacent. The extension of the wharf to four times its present capacity is contemplated as traffic increases, and the freight storage shed can be increased to three times its present capacity. The water along the frontage is being deepend so that the largest vessels may dock there, and with the double track that has been laid along the rear of the wharf, will make a convenient transhipment arrangement.

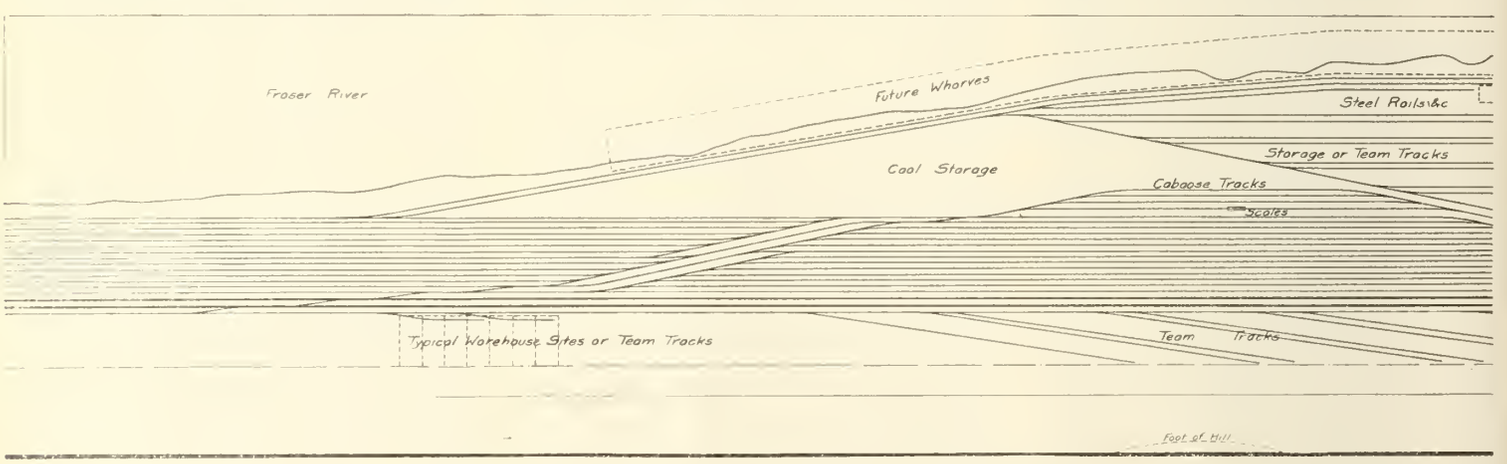
A very complete shop layout for the handling of rolling stock repairs on all the company's Pacific Coast lines, has also been planned, only a small portion of which will be completed at present. Provision has been made for the addition of all the buildings required in a complete shop layout, some of which will be built in sections, and extended as required.

The general shop scheme consists of a central midway served by a 60 ft. transfer crane, at right angles to the main line tracks. The locomotive shop will be to the east of the midway, and will ultimately be 150 by 600 ft., with 24 locomotive pits. The initial section now being built, is 250 ft. long, containing 10 pits. This shop will be served by an 80 ft. transfer table along the east side, extending the full length of the shop. Only the portion corresponding to the part of the shop now being completed, is being built at present. On the east side of the transfer table, there will be a corresponding number of storage tracks, served by the transfer table. The locomotive shop, like all the buildings of the plant, will be of concrete construction, divided into two longitudinal bays by a central row of cast iron columns. It will contain two 10 ton travelling cranes, and a 200 ton electric jack for wheeling locomotives. This building will be the only part of the shop layout to be completed at present, all the other buildings being projected.

All the remaining buildings of the plant will be situated to the west of the midway. Abutting the midway will be the pattern shop, 50 ft. square; foundry, 100 by 200 ft.; coal and iron shed, 50 by 200 ft.; blacksmith shop, 100 by 200 ft., and stores, 50 by 150 ft. The latter building will be surrounded by a platform, 75 by 350 ft., for the rough stores. To the rear of the stores will be the scrap bins, with track scales in one of the stores service tracks, and with the oil storage tank nearby. The passenger car shop, 100 by 200 ft., will be directly to the rear of the blacksmith shop. The woodworking department, consisting of the planing mill, 100 by 150 ft.,



Canadian Northern Railway Port Mann Terminal Layout (Section 1).



Canadian Northern Railway Port Mann Terminal Layout (Section 3).

and the lumber shed and kiln, will be directly to the rear of the coal and iron shed, with lumber storage space to the rear of the lumber shed. The freight car shop, 100 by 300 ft., will be to the rear of the foundry, and the power house, 50 by 100 ft., to the rear of the pattern shop. All these buildings will be approached from the west from a ladder track, which will leave the service track along the south of the main line tracks near the west end of the main yards. The ladder, in addition to leading into the shop service tracks, will serve a 6 track freight car repair yard, and a 5 track passenger car storage yard, to the rear of their respective shops.

Canadian Society of Civil Engineers Annual Meeting.

The annual meeting was held in Montreal, Jan. 27 to 29. The reports of committees, and which are of interest to railway engineers, were published in Canadian Railway and Marine World for February.

The following officers were elected:—President, M. J. Butler, Montreal; Vice President, R. A. Ross, Montreal; Members of Council, J. M. R. Fairbairn, Montreal; Prof. H. M. Mackay, Montreal; R. McColl, Halifax, N.S.; A. R. Decary, Quebec; R. F. Uniacke, Ottawa; W. A. Bucke, Toronto; F. Lee, Winnipeg, and G. R. G. Conway, Vancouver.

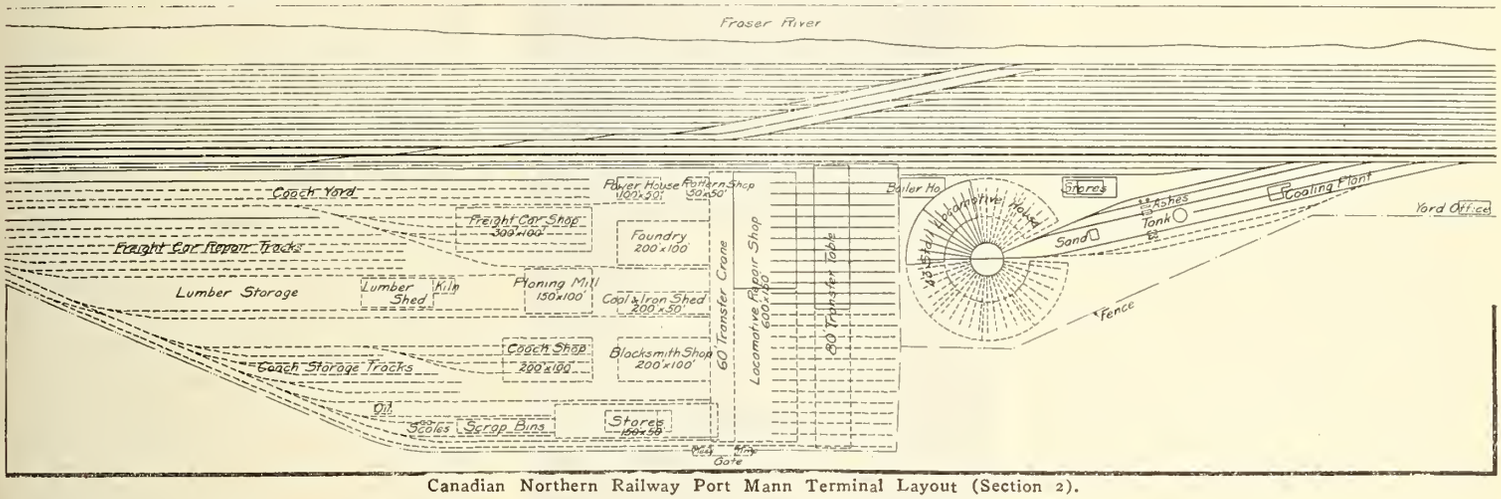
The society has 2,794 members and assets of $108,300, including the new premises on Mansfield St., Montreal, valued at $90,000.

The features outside the business meeting included a luncheon tendered by the Montreal members; a smoking concert and a dinner at the Engineers Club, presided over by the Vice President, H. H. Vaughan, Assistant to the Vice President C.P.R., in the absence of the President, Phelps Johnson. A visit was paid to the St. Lawrence Bridge Co.'s plant at Rockfield, and also to the Canadian Northern Ry.'s Mount Royal tunnel.

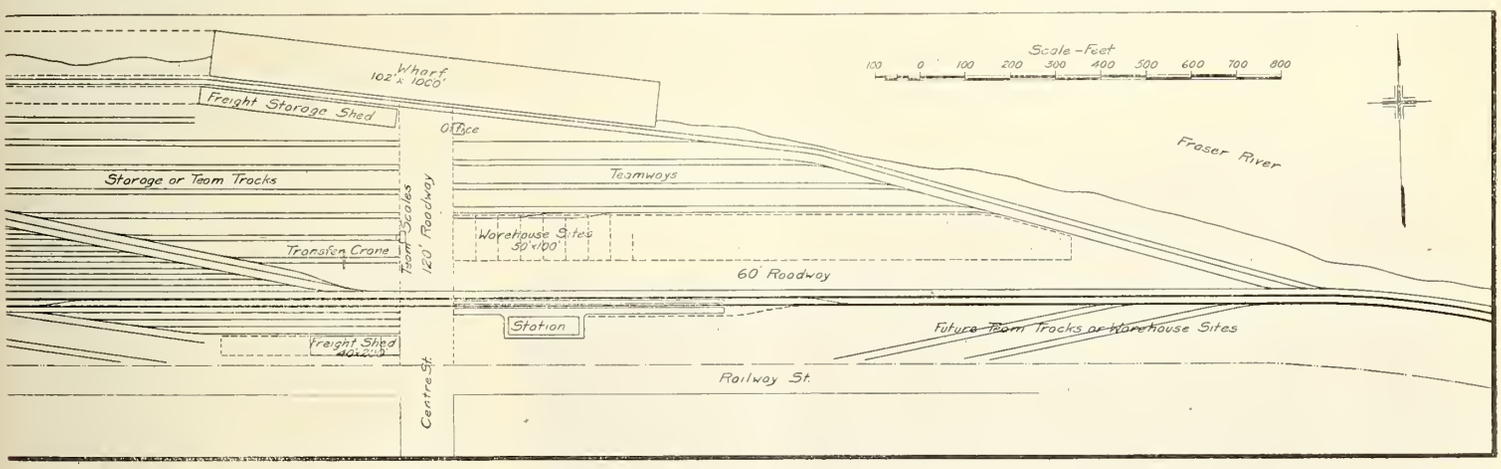
Dominion Government Railway to Hudson Bay.

Replying to a question in the House of Commons, Feb. 2, the Minister of Railways said the length of this railway from Pas to Port Nelson, Man., is 418.5 miles. The whole mileage is under contract, viz.—Pas to Thicket Portage, 185.5 miles; Thicket Portage to Split Lake Jct., 68 miles; Split Lake Jct., to Port Nelson, 165 miles. The state of construction is,—Miles of steel laid, 86; miles surfaced, 56; grading fairly completed with the exception of a few cuts at miles, 110, 121 and 133 and some cross laying, 137.

In a discussion on the project in the House of Commons, Feb. 11, the Minister of Railways stated that while Port Nelson is not an ideal harbor for the seaboard terminal of the railway, it is superior to Fort Churchill. To reach the latter port it would be necessary to carry the line across 70 miles of "badlands." The misadventures of



Canadian Northern Railway Port Mann Terminal Layout (Section 2).



Canadian Northern Railway Port Mann Terminal Layout (Section 4).

The locomotive house at this point will be to the east of the locomotive shop, and will eventually be a 43 stall unit. Only a 15 stall section is being built now, and with it only half the mechanical yard accomodation. The locomotive house will be approached from the east. Of the mechanical yard arrangements, only the northerly half will be constructed at first, the southerly half awaiting the completion of the locomotive house. Adjoining the locomotive house, there will be a boiler and engine house, and to the east, a stores building.

All the buildings will be of concrete, the same as the buildings of the shop layout, and all of them have been, or are being built by the Imperial Construction Co., Toronto. We are indebted to J. Montgomery of this company for the data on which this article is based.

The Canadian Northern Ex. Co. has opened offices at Solina, Ont, and Neelin, Man., and has closed its office at Polwarth, Sask.

Dominion Railway Subsidy Agreement.—The Dominion Government entered into an agreement, Jan. 20, under the act granting aid in the construction of railways, with the Esquimalt and Nanaimo Ry., for lines from McBride Jct., towards Sandwich, B. C., 45 miles; and from Sandwich to Campbell River, B.C., 38 miles.

vessels during the last season of navigation were due to various causes but the loss and damage had not been anything like so serious as was reported. As much progress has been made with the terminal work as could reasonably be expected. It is intended to send in a strong force of men overland, so as to make an early start on the work, and make as much progress as possible during the open season this year. (Feb., pg. 70.)

The Canadian Northern Ex. Co. has opened an office at Hafford, Sask., and has closed its offices at Berton, Ladysmith, Neelin and White Plains, Man., and Chandler and Fairlight, Sask.

New Standard Dining Cars, Canadian Pacific Railway.

A departure in dining car design has been made in the latest ones for this service built by the C. P. R. It has been realized for some time that the principal weak point in dining car service lay in the kitchen, where the cooks, through lack of space, were unable to fill orders as promptly as passengers frequently considered necessary. Before the order could be prepared, in the event of the dining car being well filled, the accumulation of orders unavoidably caused a delay in the preparation of the late order. From the company's standpoint, this involved a direct loss, as on the heavy runs the number of passengers desiring to avail themselves of dining car accommodation is enough to fill a car at several sittings. As nearly all desire their meals within a short period of time, the problem resolved itself, from the company's viewpoint, in either providing additional dining cars to handle the extra passengers quickly, or else so arranging the facilities that one car would meet all requirements in the limited meal period. As the kitchen had proved itself the weak point, it was to it that attention was concentrated in an endeavor to increase the car capacity.

A step in the right direction was made in dining cars some time ago, and has been quite generally adopted, viz., the utilization of one of the vestibule ends for interior purposes, leaving only one end with a vestibule, the body at the other end extending out to the buffer. In the C. P. R.'s latest design, a further step has been made in the elimination of the vestibule at the other end also, as it was realized that the dining car, being always used in conjunction with other cars, required no side vestibule entrance for passengers, and that for the employes, the side provision door would meet all requirements.

In the new cars, the dining room section, and the lockers at the end of the car are left as in the former standard design, the additional space available at the other end of the car by the elimination of the second vestibule, being added to the kitchen, leaving room for an additional range, with accommodation for increased kitchen employes. The increased kitchen accommodation is shown in one of the accompanying illustrations, looking from the car end towards the dining section. The length of the range in the foreground has been increased by the length of the standard vestibule, the car length over buffers being as before. The kitchen proper is now 14¼ ft. long, sink section, 6 ft. 5 ins., and pantry 6¾ ft.

From the diaphragm end of the kitchen, there is a low door into the passage for an emergency exit for the dining car employes. In place of the usual provision door in the blind vestibule of the usual dining car, there is a side door near the diaphragm end of the kitchen, as shown in the view of the car exterior, which is very similar, only narrower, to that of a baggage car. It is entered by a metal ladder.

Enlarged Kitchen of Canadian Pacific Railway Dining Cars.

The main part of the car is the same as in former designs, containing 6 tables for 4 and 6 for 2, giving a seating capacity of 36. With the increased kitchen accommodation, the meal serving capacity has been considerably increased, as the operation of the cars has already proved.

Canadian Pacific Railway Dining Car Without Vestibules.

Calendars for 1914 have been received from American Steel Foundries, Chicago, and Taylor and Arnold, Ltd., railway supplies, Montreal.

Interchange of Traffic With Canadian Northern Railway at Toronto.

Announcement was made in Canadian Railway and Marine World for February that there is to be a complete interchange of passenger traffic at Toronto between the Grand Trunk and Canadian Pacific on the one hand, and the Canadian Northern Eastern Lines on the other. For a number of years there have been restrictions in this interchange at Toronto that have prevented passengers coming from points on other lines travelling by Toronto, to a number of points reached by the Canadian Northern Ontario, because tickets could not be issued through. By the arrangement now entered into, passengers will be able to obtain through tickets and the benefit of the through fares to all points reached on Canadian Northern Eastern Lines.

To the East, passengers will be able to go by Toronto through to the Rideau Lakes, Ottawa, Montreal and on to Quebec and the Lake St. John country north of Quebec. North of Toronto they may go to Sparrow Lake, and to the Muskoka Lakes, where the Canadian Northern passes through the centre of the district with wharf side stations on Bala Park Island and on the shores of Lake Joseph where they have a marine railway at Lake Joseph station for the handling of motor craft direct from the cars into the water. The line runs into Parry Sound and follows the Hinterland to the Georgian Bay, crossing Bolger Lake, the Maganetewan, Pickerel and French Rivers to Sudbury. At Capreol the line from Toronto is joined by the one from Montreal now nearing completion; the steel is laid all the way to Port Arthur. At present the line is only being operated to Ruel; but when opened through shortly, it will link the eastern and western lines of the system.

Minneapolis Railway Stations.—Several plans have been prepared for a municipal railway terminal at Minneapolis, Minn., which all railways entering the city would use. Three separate stations are now in use. Three years ago the State Legislature passed a law authorizing cities of the first class, of which Minneapolis is the only one, to build union stations and to force all railways to use it. A year ago the law was amended to cover a defect, and last November the City Council ordered the city engineer to prepare plans. By the law the city can condemn property, relocate stations, design and force railways to use the municipal terminal at a rental charge which will pay interest on the bonds and create a sinking fund. The city will submit the plan to the Railway Warehouse Commission, from which body the railways may appeal to the courts in case of disagreement. The nearly completed union station for the Chicago & Northwestern Ry. and the Hill roads may or may not be utilized in the new scheme.

The Great Railway Tunnels of the World.—The world's greatest tunnels are in Europe. The greatest is the Simplon, which is 12¼ miles long. Two, the St. Gothard and Lotschberg, are over 9 1-3 miles long. The Mont Cenis is a little over 7 miles long. The Arlberg, in Austria, is 6¼ miles long. There are four tunnels between five and six miles long, five between four and five miles long, seven between three and four miles, and 16 tunnels that are over two miles long. The longest tunnel in the United States, the Hoosac, is four and one third miles long. The C.P.R. tunnel at Rogers Pass, B.C., now under construction, will be 5 miles long, and the Canadian Northern Ry. Mount Royal tunnel will be 3 1-3 miles.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Burrard Inlet Tunnel and Bridge Co.—The plans and profile have been officially filed for the projected railway, station 0 to station 130 + 036, on the south shore of Burrard Inlet, Vancouver. We are officially advised that there is no intention at present of going on with the construction of this line, the plans being filed with the intention of making provision for a railway from the south end of the proposed bridge across the Second Narrows of Burrard Inlet, to the Great Northern Ry. in the Hastings townsite section of Vancouver. Cleveland and Cameron, Vancouver, are engineers for the company.

The plans for the bridge were prepared in London, Eng., and were released from the Customs House at Vancouver, Feb. 5, on payment of a reduced duty of $2,430. They are on view at the offices of Cleveland and Cameron, and contractors are figuring preparatory to putting in their tenders. At a meeting of the directors, Feb. 4, it was decided to arrange for a 100 ft. right of way at the northern end of the bridge, as an excessive price is being asked by the Indians of the reserve for the 200 ft. right of way originally planned. It was agreed that a condition shall be inserted in all contracts in connection with the erection of the bridge, that so far as possible Canadian materials shall be used. (Feb., pg. 69.)

Calgary and Fernie Ry.—The Calgary, Alta., Board of Trade, has been informed by the company's secretary that arrangements have been completed for the financing of the project, and that it is hoped to start construction early in the spring. A resolution was passed endorsing the application now before the Dominion Parliament for an extension of time for construction. (Feb., pg. 69.)

Central Canada Ry.—D. F. McArthur, who is associated with J. D. McArthur in connection with the Alberta and Great Waterways Ry., and the Edmonton, Dunvegan and British Columbia Ry., is reported to have said in an interview that construction will be started on the C. C. R. in the spring; that the surveys for the line have been completed, and that the company's bonds, which have been guaranteed by the Alberta Legislature, have been put on the market. The located line starts at Round Lake, on the E. D. and B. C. Ry., runs to Peace River Crossing and along the north bank of the Upper Peace River to Dunvegan. (Dec., 1913, pg. 573.)

Central Western Canada Ry.—Application has been made to the Dominion Parliament for the incorporation of a company to build a railway from Winnipeg in a generally northwesterly direction via Yorkton, Saskatoon and Battleford, to Edmonton, Alta. The provisional directors are:—S. Johnston, J. J. Dixon, F. C. Tisdell, C. Cronyn, A. Johnston, Toronto. The title of the company, originally Central Canada Ry., was changed, as it conflicted with a company building a line in Alberta, under a provincial act. (Dec., 1913, pg. 753.)

Chicago, Milwaukee and St. Paul Ry.—Chicago, Milwaukee and Puget Sound Ry.—The company's lines have an entry into Sumas, Wash., over the Bellingham Bay and British Columbia Ry. tracks, and it is reported that engineers are locating a route from Sumas to Huntingdon, B.C., in connection with the company's projected entry into Vancouver. The route being located is across the Sumas flats to a connection with the Canadian Northern Pacific Ry. (Dec., 1913, pg. 573.)

Churchill Southern Ry.—The Manitoba Legislature has incorporated a company with a railway to be operated by steam, electricity or any other motive power, from Fort Churchill, southerly to Kettle Rapids, on the line which the Dominion Government is building from Pas, to Port Nelson, Man., with branch lines to any point in the Province of Manitoba. The company is given authority to develop water powers, and to distribute electric energy for all purposes. The provisional directors are:—W. Beech, W. Chambers, T. Wright, C. Atchison, Winnipeg; W. Georgson, Calgary, Alta.

Edmonton, Dunvegan and British Columbia Ry.—A train service has been put in operation between Edmonton and Smith, heretofore known as Murray Landing, 130 miles. A bi-weekly service in either direction is being given. (Feb., pg. 69.)

Flathead Valley Ry.—The Minister of Railways for British Columbia has granted a certificate under the provisions of subsec. 1, sec. 79 of the B. C. Railway Act, 1911, giving an extension of time for five years from Jan. 7, for building the lines authorized by chap. 52 of the B. C. statutes of 1909. (April, 1909, pg. 247.)

High River, Saskatchewan and Hudson Bay Ry.—The Dominion Parliament is being asked to change the point of starting of this projected railway, from tps. 25 to 29. range 1 west of the 4th meridian, to tps. 17 to 29, range 1, west of the 4th meridian, in Alberta, and to extend the time within which construction may be begun. Ballarbey and Mackenzie, High River, Alta., solicitors for applicants. A meeting of shareholders for the purpose of completing the organization of the company was called to be held at High River, Alta. (Feb., pg. 69.)

Hudson Bay, Peace River and Pacific Ry.—A deputation waited on the Manitoba Government, Jan. 31, asking for a guarantee of the company's bonds, or for more direct aid in the building of the first 150 miles of the line as a colonization railway. The company's charter from the Dominion Parliament authorizes the building of a line from Winnipeg along the east side of Lake Winnipeg to Hudson Bay, and thence to the Pacific coast. The Premier replying to the deputation stated that until the navigability of Hudson Bay was assured the Government would not be justified in assuming any responsibility in connection with the construction of the line generally. So far as guaranteeing the bonds for the building of 150 miles of the line as a colonization line, the Government was prepared to give a most careful consideration, as soon as plans, etc., were submitted. (Oct., 1913, pg. 475.)

Kettle Valley Lines.—The Dominion Government has entered into a contract with the company under the act granting aid to certain railways for the building of a line from Merritt to Penticton wharf, 145 miles, and from 25 miles south of Merritt to near Hope Station, B. C., 55 miles. The present condition of construction on these lines was given in detail on pg. 80 of our last issue.

The Minister of Railways has approved of revised location for the section of the line between Hydraulic Summit and Penticton, 58.2 miles, and the Board of Railway Commissioners has approved of location of the line from Coquihalla Summit to Hope, 39.42 miles, on condition that a 14 degree curve shown at mileage 3.2 be changed to 12 degrees.

The British Columbia Legislature is being asked to authorize the company to build a branch from Otter Summit to Aspen Grove, tapping Copper Mountain.

Construction is being proceeded with on the following sections of the line:—End of track westerly to Penticton, 50 miles; end of track westerly to Coldwater Summit, 65 miles; end of track westerly to Hope, 39 miles. Tracklaying out of Penticton was reported to have reached Narawata, Feb. 1. At Camp Creek, the exact point reached by the steel, a large wooden structure is being erected across the chasm immediately below Spray Falls. It was expected this work would be completed by Feb. 28. (Feb., pg. 80.)

Lake Erie and Northern Ry.—W. P. Kellett, General Manager, in a letter to the press, Jan. 31, explained what was being done in connection with the work in Brantford, Ont., in regard to which the city Council had expressed dissatisfaction. The work was being proceeded with as rapidly as possible. The general contractors had resumed tracklaying and it was expected to have the steel laid from Galt to Jubilee Terrace, Brantford, by Feb. 28. When that was completed the plant necessary for the deepening of the channel of the Grand River in the city would be brought in. Mr. Kellett attended a meeting of the Parks Board, Feb. 5, in connection with the matter, at which it was stated that so far as freight traffic is concerned steam will be used as a motive power, but for passenger traffic, gasoline electric or electric storage battery cars will probably be used. Mr. Kellett stated that freight will be taken to the first yards at the foot of Jarvis and Sterling streets for sorting purposes, and the trains will be made up in a second yard which will be located at Morrell St. (Feb., pg. 69.)

Northwestern Ry. of Canada.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway, to be operated by steam, electricity or any other motive power, starting from tp. 67, range 18, west of the 5th meridian, southwesterly to the Athabaska River, about range 7, west of the 5th meridian, thence to Edmonton and Camrose, continuing southeasterly to the South Saskatchewan River about tp. 20, range 11, west of the 3rd meridian, and on to Lake Johnson, thence easterly to Maryfield, and Virden, Man., thence northerly crossing the Assiniboine River near Penrith, and on easterly to Carberry, Winnipeg, Molson, Fort William and Port Arthur, Ont. Foster, Martin, Mann, Mackinnon and Hackett, Montreal, solicitors for applicants.

Ottawa, Brockville and St. Lawrence Ry.—The Dominion Parliament is being asked to grant an extension of time for the building of the line authorized by chap. 71, of the statutes of 1900. N. Belanger, Ottawa, is secretary. (May, 1912, pg. 239.)

Pacific and Hudson Bay Ry.—The Minister of Railways has approved of route map of this projected railway from Bella Coola to Hutnarko River, B. C., 60 miles. (Jan., pg. 22.)

Pacific Great Eastern Ry.—The total issue of 4½% bonds authorized for the building of this railway is £3,326,354 14s., 1d. The bonds, are guaranteed both as to principal and interest by the Province of British Columbia. Of this amount £1,500,000 had previously been sold, and a further issue of £1,375,000 was put on the market in London, Eng., Jan. 24. The price was £95, and it is reported that the entire issue has been taken up.

It is reported that arrangements are be-

ing made for the laying out of ocean and other terminal facilities at Newport, B.C., on which it is proposed to spend $2,000,000. The company is negotiating with the Dominion and the British Columbia Governments for securing the foreshore and other rights necessary for the proposed developments. Tracklaying out of Newport is reported to have reached a point 24 miles to the north, and it is expected that the second crossing of the Cheakamus River will be reached at an early date. The grading is reported to be well advanced right through to Lillooet, and it is hoped that track will be laid to that point by the end of the year. (Feb., pg. 70.)

Pacific, Peace River and Athabaska Ry.—The Dominion Parliament has under consideration an application for the incorporation of a company with this title to build a railwaay from the mouth of the Naas River, on the Pacific coast of British Columbia, easterly and northerly for about 200 miles to the height of land between the Naas and Skeena watersheds, then to the Skeena River, and along that river and the Bear River, crossing the divide to the Driftwood River, on to North Tacla Lake, via Hogem Pass, to the Omineca River, reaching the Peace River; along that river to Vermillion rapids or chutes, Alta., thence to Point Providence, along the Athabasca River to Fort McMurray, along the Clearwater and Pembro Rivers to the height of land; thence to the Buffalo River,and continuing easterly and southerly to Prince Albert, Sask. The provisional directors are: C. F. Law, V. Quinn, Vancouver, B.C.; T. A. Burgess, Ottawa; D. A. Thomas, Cardiff, Wales; V. Lloyd-Owers, London, Eng. (Dec., 113, pg. 575.)

Pacific Trans-Canada and Hudson Bay Ry.—The Dominion Parliament is being asked to extend the time for the building of the railway authorized by chap. 134 of the statutes of 1912. Smith and Johnston, Ottawa, are solicitors for applicants. (May, 1912, pg. 239.)

Peace River Tramway and Navigation Co.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway with a gauge of 3 ft., to be operated by steam, electricity or other power, from Smith's Landing, on Slave River, easterly to Fort Smith, Alta.; and another from the Vermillion rapids easterly along the north bank of the Peace River, to north of Vermillion Falls. The company may carry on a general navigation business on the Peace, Slave and Mackenzie Rivers. The provisional directors are C. F. Law, W. H. Armstrong, G. Blair, Vancouver, B.C.; T. A. Burgess, L. Cote, Ottawa. (Dec., 1913, pg. 575.)

Prince Edward and Hastings County Ry.—Application is being made to the Dominion Parliament for authority to build an additional line from Brighton to Picton, thence easterly to Kingston, Ont.; and for an extension of time for building the lines previously authorized to be built. Pringle and Guthrie, Ottawa, solicitors for applicants. (June, 1912, pg. 301.)

Reid Newfoundland Ry.—The Fortune Bay branch has been surveyed through to Boat Harbour, and has been completed to Black River, 15 miles of track having been laid from Goobies during 1913. The distance from Black River to Boat Harbour is 64 miles, on which the company will push construction during this year. It is also proposed to push work during this year on the 42 mile branch from Grand Lake to Bonne Bay.

Two branch lines have been completed, viz.: The Trepassey branch, from Waterford Bridge to Trepassey, the last five miles of track being laid during 1913; and the Heart's Content branch, from Broad Cove to Heart's Content, the last mile of track being laid in 1913. (Feb., pg. 70.)

Saskatoon and Hudson Bay Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of the line authorized by chap 137 of the statutes of 1911. C. G. Locke, Saskatoon, Sask., solicitor for applicants. (June, 1912, pg. 302.)

Sudbury, Kepawa and Bell River Ry.—The Dominion Parliament is considering an application for the incorporation of a company with this title, having power to build a railway from Sudbury, Ont., to Kepawa Jct., Que., thence northwesterly to a junction with the National Transcontinental Ry. at the crossing of Bell River. The provisional directors are:—J. Lumsden, A. Ellis, A. E. Hea, Ottawa; P. J. Loughrin, West Toronto; L. O'Connor, Sudbury, Ont.

Timiskaming and Northern Ontario Ry.—Speaking at Cobalt, Ont., recently, J. L. Englehart, Chairman of the T. and N. O. Ry. Commission, is reported to have said that plans for the diversion of the route of the southern part of the line, to eliminate curves, and for the electrification of the line, had been prepared, but the time for carrying them out had not arrived. It would not be many years before both works would have to be done. With regard to the proposal to extend the line from Cochrane to Hudson Bay, there was no reason at present fo rgoing on with the work. The time would come when the line would have to be built to James Bay, but the country through which the present line passed would have to be developed first.

The members of the Commission propose, at an early date, to go over the route for a proposed extension of the Elk Lake branch to Gowganda. It is reported that a new route has been found which is estimated to cost $600,000 instead of $1,000,000, the estimate for a previously located route. It is reported that if the new route is found satisfactory arrangements will be made for starting construction this year. (Feb., pg. 70.)

The Toronto, Hamilton and Buffalo Ry. will appeal against the decision of the Board of Railway Commissioners as to the question of the relocation of line in Hamilton, which was given in full on pg. 567 of our last issue. The Hamilton City Council has also decided to appeal against the decision, principally on the ground that the Commissioners hold that they cannot order the removal of tracks for more than a mile. (Feb., pg. 70.)

Vancouver Railway and Ocean Terminal Co.—The Dominion Parliament has been asked to incorporate a company with this title to acquire by lease or otherwise land in Vancouver and lay out thereon all necessary buildings for railway and ocean terminals, and in connection therewith to build double track line as follows: From the south side of False Creek, 500 ft. east of Main St., westerly along the south side of False Creek and English Bay, to 2,000 ft. west of Blanca Road, Point Grey. Deacon, Deacon and Wilson, Vancouver, B.C., solicitors for applicants.

Winnipeg.—An act has been passed by the Manitboa Legislature declaring that, as part of the undertaking, the Commissioners of the Greater Winnipeg Water District are authorized to build and operate a railway or tramway from Winnipeg easterly and southerly to the eastern boundary of the province. They may use steam, electricity or any other motive power in its operation.

Tenders are under consideration for the supply of all the tools and materials, except ties, rails and sundry steel, and for the building of grade and laying of track for 85 miles, more or less, of standard gauge railway, and for the building of a telephone line along the right of way. Tenders are also under consideration for the supply of 8,500 tons of 60-lb. new or relaying rails; 400 tons of angle bars, 256 tons of bolts and spikes, and 20 frogs and switch stands for this line. The estimated cost of construction is put at $480,000; of track material at $450,000, and of the telephone line at $22,000, exclusive of poles The clearing of the right of way will cost $60,000, and the buildings for the engineers' offices are estimated to cost $10,000. The contract for the telephone posts has been let to Bentz, Richardson Co., Winnipeg, and the contract for ties to O'Brien, Fowler and McDougall, Ottawa. (Feb., pg. 80.)

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414,500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	298,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
	$13,364,900	$9,324,200	$4,049,700	$587,700
Incr.	$ 1,125,600	$ 537,300	$ 587,700	.....

Average mileage under operation during 1913, 4,480, against 4,297 in the previous year. Mileage operated during Dec., 1913, 4,458.

Approximate earnings for January, $1,570,000, against $1,513,400 for January, 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$11,093,062.27	$7,876,269.09	$4,116,793.18	x$331,383.72
Aug.	11,434,459.88	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,503.96	4,226,821.71	x168,897.80
	$75,286,162.03	$48,074,725.36	$27,211,436.67	$ 80,284.52
Incr.	$ 1,759,970.66	$ 1,679,686.14	$ 80,284.52	.....

x Decrease.

Approximate earnings for January, $7,719,000, against $9,519,000 for January, 1913.

The mileage under operation was increased during January to 11,884.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T.W.R., and D.G.H. & M.R., for Jan., and increases, or decreases from the figures for Jan., 1913:

	1914	1913	Increase	Decrease
G.T.R.	$2,865,527	$3,097,977	.....	$232,450
C.A.R.	158,256	176 874	.....	18,618
G.T.W.R.	555,473	590,147	.....	34,714
D.G.H. & M.R.	190,295	186,024	$4,271	.....
Totals	$3,769,511	$4,051,022	$4,271	$281,511

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch for January, were $368,318, against $377,844 for Jan., 1913.

Standard Rules on the Intercolonial Ry.—A circular was issued Feb. 10, stating that the standard code of General Train and Interlocking Rules will be put into effect at midnight, May 30. The rule books are being distributed under the direction of the Superintendent of Stations, Trains and Train Dispatching. Three instructors have been appointed in each of the four districts to explain the rules, and to give instructions therein at different points in their districts, which employes are to attend.

Canadian Pacific Railway Construction, Betterments, Etc.

Ontario Division.—Press reports state that surveys have recently been made which will give the C.P.R. a new line into Kingston, Ont. The route said to have been followed is from Kingston westerly to a junction with the newly completed Campbellford, Lake Ontario and Western Ry. at Brighton, about 72 miles. A charter is being asked from the Dominion Parliament for the Prince Edward and Hastings Ry. to build such a line.

The second tracking of the C.P.R. line west from Toronto, between Islington and Guelph Jct., 29.88 miles, has been finally completed, although trains have been running over it for some time. The authorization to open it for traffic was given by the Board of Railway Commissioners, Jan. 29. Nothing definite had been decided to Feb. 20, regarding the building of a second track further west of Guelph Jct. this year, but it is said that it was contemplated to build a second track as far west as Ayr or Galt, this year. The plans have all been prepared for the second tracking to London. Local press reports in that city state that considerable developments are to be made there, in preparation for the coming of the second track, and for the probable construction of a line to Sarnia, for which the company holds a charter.

The Minister of Railways has approved of route maps of a line from the C.P.R. at Guelph Jct. to Cedar Mills, Ont., 35 miles.

Lake Superior Division.—The Board of Railway Commissioners has approved of revised location plans for a portion of the line as built, mileage 29 to 32.69 old line mileage, and mileage 29 to 32.49 new line mileage, on the White River Subdivision. This is a revision of location, in connection with the second tracking of the line from Sudbury to Port Arthur, which is now in progress.

Saskatchewan Division.—The Dominion Government entered into a contract with the C.P.R., Jan. 8, for the building of a railway bridge over the Saskatchewan River at Outlook, Sask. The bridge has already been built.

Alberta Division.—The extension of the line from Weyburn, Sask., westerly, is now in operation as far as Shaunavon, Alta., 250 miles from Weyburn, the last strentch of 137 miles having been opened for traffic Feb. 1. West of Shaunavon about 75 miles of grading are ready for track laying, and there are only a few miles of grading to be done to complete the line to a junction with the branch running easterly from Stirling. This is one of the lines to be completed this year. On the completion of this line there will be a new line with low gradients between Lethbridge and Weyburn, 435 miles.

The line westerly from Suffield has been opened for traffic to Retlaw, Alta. It is 56.7 miles long.

The Minister of Railways has approved route map for a branch line from Caron to a junction with the line from Bassano, Alta., easterly, 152.24 miles.

Alberta Central Ry.—It is reported that the 20 miles of this line from Red Deer, Alta., in the direction of Rocky Mountain House, will not be opened for traffic before July 1. In connection with the extension of this line press reports state that negotiations are in progress with a Canadian Northern Ry. subsidiary, for the joint use of a certain mileage of route.

Kootenay Central Ry.—An agreement has been entered into between the Dominion Government and the company under the act granting aid to certain railways for the building of a line from Golden, via Windermere and Fort Steele, to the British Columbia Southern Ry. near Jukeson, B.C., 175 miles. Construction has been going on between the two points named for about three years. Details of the work already completed show that tracq laying has been completed southerly to Edgewater, and northerly to Wasa. The grading on the 72.9 miles between these points is completed. Track will be laid on this grade during the year, and the line opened right through from the Crows Nest Pass line at Colvalli to the Transcontinental line at Golden, B.C., in the fall. The only part of the line now being operated is from Golden southerly to Spillimacheen.

Kaslo and Slocan Ry.—The line known by this title and formerly part of the Great Northern Ry. lines in Canada, has been rebuilt as a part of the Pacific Division of the C.P.R. F. C. Cambie, of the Department of Railways, inspected the reconstruction work, Feb. 5, and it is said that the line will be put in operation early in March. The cost of rebuilding and standardizing the line is said to have been $300,000, towards which the British Columbia Legislature voted $100,000.

Rogers Pass Tunnel.—An order in council was signed Feb. 3, authorizing the boring of a tunnel and approaches in Glacier Park near Rogers Pass, between Beaver Mouth and Ross Creek, mileage 74.6 to 88.56, subject to the execution of an agreement calculated to protect park interests.

A full contract has been let by Foley, Welch and Stewart, the general contractors, for the boring of the pioneer tunnel, to McIlwee and Sons, Denver, Colo.

Pacific Division.—The appropriations for the division for the current year cover the laying of 30 miles of steel on spurs and other tracks; the construction of a section of 20 miles of second tracking at Revelstoke; the building of 10 new steel bridges; and the relaying of a number of miles of track with new 85 lb. rails. At Vancouver in addition to the work already in progress, the appropriations provide for filling in behind the seawall along the centre waterfront owned by the company. (Feb., pg. 74.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Removal of Regular Station Agents.

General order 119, Jan. 31. Re various complaints received by the Board stating that the Canadian Pacific Railway, Canadian Northern, and Grand Trunk Pacific Railway Companies are removing regular station agents from various specified stations west of Fort William and Port Arthur, such complaints further alleging that such removal on inadequate notice works to the detriment of the applicants and the communities wherein they reside. It is ordered that, whenever a railway company intends to remove a regular station agent, it shall first notify the local municipality or board of trade of its intention to apply to the Board for an order permitting such removal. Such application and notice shall state the grounds on which such removal is sought to be justified, and shall, in each instance, show the gross earnings at the station in question from passenger as well as freight traffic and express business during the previous year. It is further ordered that no regular station agent shall be removed until such removal be first authorized by the Board.

Detention of Refrigerator Cars.

General order 120. Re special tariffs filed by railway companies establishing certain charges for the detention, by shippers and consignees, of refrigerator cars, when loaded with perishable freight, over and above the car service toll prescribed by order 906, Jan. 25, 1906. It is ordered that the special tariff of charges for detention of refrigerator cars when used for shipments of perishable freight, published and filed by railway companies be amended by eliminating the clauses therein relating to detention at the points of loading of the said cars. And it is further ordered that on the publication and filing of tariffs so amended, general order 115, Dec. 19, 1913, and orders 21,127 and 21,128, Dec. 29 and 27, 1913, respectively, be rescinded in so far as they affect the several railway companies filing the said amended tariffs.

Import Rate On Pulp Wood.

21148, Jan. 2. Re application, as amended, of the Howell Co., Toronto, for an order directing a reduction in the import rate on wood pulp from Montreal to Windsor Mills, Que. It is ordered that the G. T. R. Co. be directed to establish, and put into force a rate of 8c. per 100 lbs. on imported wood pulp, in carloads, from Montreal Harbor to Windsor Mills, Que., the said rate to include those terminal charges at the Port of Montreal which are included in the rates of the G. T. R. Co.'s general tariff on import merchandise, as published and filed.

Esquimalt and Nanaimo Ry. Tariff.

21238, Jan. 21. Re application of Esquimalt and Nanaimo Ry. Co., for an order further extending the time within which it may be permitted to file a revised standard freight tariff for approval. It is ordered that the time within which the company was required to file the said tariff of maximum freight tolls for approval be further extended for six months from the date of this order.

Pulpwood Rates Temiscouata Railway.

21269, Jan. 28. Re the Temiscouata Ry. Co.'s Special Commodity Tariff, C. R. C. 217, and Joint Freight Tariff, C. R. C. 221. increasing rates on pulpwood, in corloads, from points on its railway to Riviere du Loup, Que., for local delivery and to points in Canada and the United States, respectively. It is ordered that the effective dates of the said tariffs published to become effective on Jan. 1 and 24, respectively, be postponed until Aug., 1914, and it is further ordered that order 21105, Dec. 22, 1913, be rescinded.

Grand Trunk Tariffs Suspended.

21326, Feb. 10. Re supplements 151 and 153 to the G. T. R. Co.'s Tariff, C. R. C. no. E. 2552. Upon the complaint of the Canadian Manufacturers Association. It is ordered that these supplements published to take effect Feb. 15 and 16, respectively, be suspended, pending investigation by the Board.

Canadian Pacific Railway Tariffs Suspended.

21327, Feb. 10. Re supplements 40 and 42 to C. P. R. Co.'s tariff C. R. C. no. E 2559. Upon the complaint of the Canadian Manufacturers' Association It is ordered that the advanced rates published in the said supplements applying on building brick from Cooksville and Weston, Ont., to Toronto, and on gravel and building sand from Cooksville, Ont., to North Toronto, Parkdale and Toronto, be, and they are hereby, suspended pending investigation by the Board.

Proposed Increase in Switching Charges.

21329, Feb. 6. Re supplements 19 and 20 to the G. T. R. Co.'s tariff, C. R. C. no E

2677, increasing as from Feb. 15, 1914, switching charges within Toronto terminals. Upon reading the applications of the Canadian Manufacturers' Association, the Toronto Board of Trade, the York Sandstone Brick Co., and the York Sand & Gravel Co., protesting against the proposed increase. It is ordered that they be suspended, pending the hearing and determination of the matter by the Board.

Natiional Transcontinental Railway Construction.

The ninth annual report of the Commissioners of the N. T. R. shows that the expenditure for the year ended Mar. 31, 1913, was $13,729,461.44, making a total of $130,247,152.95 since construction was started. The total grading done was 1,739 miles, on which 1,720.36 miles of main line track had been laid, and 384.73 miles of sidings, yard tracks, and second track. Since that date the grading on the line has been completed and track laid on the entire 1,804 miles between Moncton and Winnipeg.

An interim report of the commissioners presented to the House of Commons, Feb. 18, shows that the total expenditure on the line to Dec. 31, 1913, was $140,562,147, of which $10,314,944 was expended since Mar. 31, 1913. Track laying had been completed over the entire line, and the bridges were 95.3% completed. At the date of the report trains were being operated on 1,160 miles of the total 1,804 miles between Moncton and Winnipeg, and the report stated that trains could be run on the remaining mileage if there was any immediate necessity therefor.

The line from Moncton to Edmunston, N B., 230 miles, was put in operation Nov. 20, 1912, and the result of the operation shows, a revenue of $13,557.76, with operating expenses of $36,146.97, and expenditure on equipment of $7,009.38, and $3,006.95 net on stores. The deficit is $32,605.54, against which is placed $3,577.37 of uncollected earnings, and $10,016.33, value of equipment and stores on hand. In addition to this section there is a considerable mileage east and west of Cochrane, Ont., being operated by the contractors, and the section from Winnipeg, east to Superior Jct., is being operated by the G. T. Pacific Ry.

It was reported Feb. 6, that the entire line from Moncton to Winnipeg will be ready for operation by Sept. 1. (Feb., pg 72.)

Grand Trunk Pacific Railway Construction.

The Commissioners of the National Transcontinental Ry. are asking the Dominion Parliament for an extension of time for the completion of the prairie section of the Western Division of the line,—from Winnipeg to Prince Rupert—which is being built by the Grand Trunk Pacific Ry. The extension asked is for one year from Dec. 1, 1913. A similar extension is being asked for by the G. T. Pacific Ry.

The Board of Railway Commissioners has authorized the opening for traffic of the section of the main line between Fraser River, mileage 1,189 westerly of Winnipeg, and Fort George, B.C., mileage 1,280.5, the speed of trains being limited to six miles an hour at the Fraser River bridge and to 15 miles an hour on the last 35 miles into Fort George. A tri-weekly train service was put in operation Feb. 1, over the section. The line is completed and in operation easterly from Prince Rupert, to mileage 324. This leaves 124 miles of grading and tracklaying to be completed. The grading on this section is well advanced and it is expected to have tracklaying completed during next summer.

The question of the location of the station at Fort George, B.C., has been finally decided on an appeal to the Governor in Council, judgment being given Feb. 8. The Board of Railway Commissioners after two hearings directed in May, 1913, that the company should build its station within 3,000 ft. of the eastern boundary of Firt George. The company appealed, and it has now been decided that the station must be built as ordered by the Board.

Considerable progress has been made with the wharves, dry dock and other facilities which are being constructed at Prince Rupert for use on the opening of the line right across the continent.

The annual report of the Minister of Railways for Alberta shows that to Dec. 31, 1913, the Province had guaranteed the company's bonds at the rate of $15,000 a mile for the building of 201.5 miles of line from Tofield to Calgary, and at the rate of $20,000 a mile for 58 miles from Bickerdike southwesterly. These lines are now practically completed. Guarantees of bonds were voted for some other lines, but up to the end of 1913, the construction of them had not been arranged for.

The arbitrator appointed to fix the value of the R. N. W. M. Police barracks site at Calgary, Alta., which the G. T. P. Ry. had required for terminal purposes, decided on $210,000. The Dominion Government in reviewing the proceedings increased the price to $250,000, which the company has agreed to pay. An order in council was signed Jan. 27 granting the site to the company at that figure subject to the company donating a right of way 25 ft. wide on the south and west sides of the property so as to widen 9th Ave. and 6th St. East, and to erecting on the site a station having the same character and accommodation as that to be erected at Regina. (Feb., pg. 72.)

Exclusive Use of Drawing Rooms and Compartments.

Central, New England, Trunk Lines and Southwestern Passenger Association railways recently filed with the Interstate Commerce Commission, U.S.A., tariffs as to the number of tickets required for the exclusive use of drawing rooms and compartments on sleeping cars, to be effective March 1. The Trans-Continental and Western Passenger Associations also adopted similar rules, effective March 15. This has been followed by Canadian railways adopting the following rule, effective March 15:—

"A minimum of two adult first class one way or round trip passage tickets will be required for the exclusive occupancy of a drawing room, and a minimum of one and a half first class one way or round trip passage tickets will be required for the exclusive occupancy of a compartment."

The C. P. R. Hotel at Calgary, now under construction, is to be called the Palliser, Sir Thos. Shaughnessy having chosen that name in honor of the late Captain Palliser, who in 1847 led a government expedition to explore the country between Lake Superior and the Rocky Mountains. Capt. Palliser, with a staff of scientific men, continued his investigations until 1859, and reports of considerable value were published as the result.

T. W. Toby, M. Can. Soc. C. E., read a paper before the Canadian Society of Civil Engineers in Montreal, Feb. 19, on bridge substructures built by the pneumatic method.

Railway Rolling Stock Notes.

The Duluth, Winnipeg and Pacific Ry. has received 100 flat cars from the Mount Vernon Car Co.

The Canadian Northern Ry. has ordered 8 baggage cars, 60 ft. long, and 3 commissary cars, 60 ft. long, from the Preston Car and Coach Co.

The Timiskaming and Northern Ontario Ry. Commission, operating the Nipissing Central Ry., expects to place an order shortly, for two interurban motor cars.

The G.T.R. has received the following additions to rolling stock:—300 box cars from Eastern Car Co.; 864 box cars from Western Steel Car and Foundry Co., and 191 gondola cars, from Pressed Steel Car Co.

The Confederation Construction Co., Thorold, Ont., which has a contract on the construction of the Welland Ship Canal, has received two saddle tank locomotives from Canadian Locomotive Co.

The Canadian Northern Ry., between Jan. 14 and Feb. 14, received the following additions to rolling stock:—75 box cars from Canadian Car and Foundry Co.; 153 box cars from National Steel Car Co.

The C.P.R., between Jan. 1 and Feb. 15, ordered the following additions to rolling stock from its Angus Shops:—142 steel frame box cars, 8 vans, 19 freight refrigerator cars, 1 ballast spreader, and 16 stock cars.

The Intercolonial Ry. has ordered 25 refrigerator passenger cars from its Moncton Shops; 180 box cars, 80,000 lbs. capacity, from Nova Scotia Car Works, and 180 box cars, 80,000 lbs. capacity from Eastern Car Co.

The C.P.R., between Jan. 1 and Feb. 15, received the following additions to rolling stock:—189 steel frame box cars, 2 vans and 5 class D4 locomotives, from its Angus Shops; and 2 class N3 locomotives from Canadian Allis-Chalmers, Ltd.

The Intercolonial Ry. has received 5 colonist cars, 4 first class and baggage cars, and 132 box cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co.; 9 box baggage cars, from its Moncton Shops; 4 consolidation and 3 switching locomotives from Canadian Locomotive Co., and 2 first class cars from Preston Car and Coach Co.

The Reid Newfoundland Co., during 1913, added the following rolling stock to its equipment, all of which was built at its shops at St. John's:—3 ten wheel passenger locomotives, 2 consolidation freight locomotives, 25 box cars, 40,000 capacity; 20 flat cars, 40,000 lbs. capacity; 2 first class cars, 2 second class cars, and 2 mail and baggage cars. Considerable additions will be made during the current year, and will also be built in the company's shops. W. E. Ladley is Superintendent of Motive Power.

The National Steel Car Co. reports having orders in hand for rolling stock, as follows:—593 wooden box cars, 30 tons capacity, for Canadian Northern Ry.; 100 flat cars, 40 tons capacity, 150 hopper cars, 50 tons capacity, and 3 eight wheel cabooses, for Toronto, Hamilton and Buffalo Ry.; 300 underframes for Michigan Central Rd.; 30 logging cars, 30 tons capacity, for St. Lawrence Pulp and Paper Co.; 8 interurban passenger cars and 2 interurban express cars, for Montreal and Southern Counties Ry.; 67 flat cars, 40 tons capacity, and 44 composite box cars, 40 tons capacity, for Pacific Great Eastern Ry.; 10 standard steel underframe baggage cars, and 500 stock cars, for Grand Trunk Ry., and 100 wooden box cars, 30 tons capacity, for J. D. McArthur Co.

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NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication.

TORONTO, CANADA, MARCH, 1914.

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Index to Canadian Railway and Marine World for 1913.

At the end of this issue is a very complete index to the contents of the volume for 1913, which, as in former years, will doubtless be fully appreciated by the large number of subscribers who bind Canadian Railway and Marine World for reference purposes.

Even a casual glance over the six pages of closely printed matter will show the tremendous range of subjects covered and the thorough manner in which this paper represents the entire transportation interests of the whole Dominion, steam railway, electric railway and marine, as well as the subsidiary express and telegraph interests and railway and canal contracting work.

Each succeeding year sees an increase in the quantity of matter published, an improvement in its quality, and a rigid adherence to the policy of accuracy which the publishers consider as one of their most valuable assets.

We are thankful to be able to repeat what we said last year in regard to the state of business, which was most satisfactory with us during 1913. The receipts from advertising steadily increased and there was a marked advance in circulation. During the past three years the average increase in circulation each year has been larger than in any previous year in the paper's history, except the year of its establishment, 1898; the number of discontinuances was again very small indeed, and the present condition of the subscription list justifies the statement, after most careful enquiry as to the circulation of other publications, that there is no other transportation paper, published in any country, which has so large a circulation as Canadian Railway and Marine World, in proportion to the population of the country of publication. The evidence in support of this statement is at the disposal of our advertising customers.

Our circulation embraces all classes of transportation officials and reaches over 90% of all the officials who have any buying power, being especially strong among the mechanical, engineering, operating and maintenance of ways officials. Advertisers who use our columns therefore know that they are covering the entire field and that no other advertising is necessary to reach any portion of it.

Our subscription lists are open for inspection by present and prospective advertisers at any time.

Report on Enquiry Into National Transcontinental Railway Construction.

The report of the commissioners appointed to enquire into matters connected with the construction of the N.T.R., G. Lynch Staunton, K.C., of Hamilton, Ont., and F. P. Gutelius, M. Can. Soc. C.E., now General Manager Canadian Government Railways, was submitted in the House of Commons, Feb. 12, but has not yet been printed and distributed. The report is very voluminous and concludes as follows:—

"We find that the N.T.R. Commission, the Grand Trunk Pacific Railway, and those having charge of the construction of the railway, did not consider it desirable or necessary to practise or encourage economy in the construction of this road. We find that, without including the money which was unnecessarily expended in building the railway east of the St. Lawrence River, $40,000,000 at least was needlessly expended in the building of this road."

S. N. Parent, ex-chairman of the Commission, has issued a reply to the report, which will doubtless be fully discussed in Parliament, as it already has been in the political press.

The Minister of Railways stated, Feb. 18. that the total cost of the investigation was $63,388. Of this Mr. Gutelius received $27,465, and Mr. Lynch Staunton $24,038. Other official services, expenses and reporting cost $11,885.

Safety First on Canadian Government Railways.

F. P. Gutelius, General Manager, has issued the following circular: "It has been decided to introduce the safety first movement on the Canadian Government Railways. This movement, now in effect on many important systems, presents a practical plan for the cooperation of officers and employes in the discovery and correction of unsafe conditions and practices which might cause injury. J. E. Long, Safety Engineer, has been engaged to install the necessary organization. His headquarters will be at Moncton, and he will report to the General Manager. In order that all concerned may understand the nature and purpose of this movement and be prepared to work together to the best advantage, Mr. Long will hold safety meetings at important centres, at which he will explain the plan of procedure in detail and also deliver addresses, illustrated by stereopticon views, from original photographs, showing unsafe conditions and practices. Notice of the time and place of these meetings will be given, and we hope that every employe, in every branch of the service, will avail himself of the opportunity to attend. The address and illustrations will be highly interesting and at the same time most practical and instructive. At a later date Mr. Long will organize on all divisions and at principal shops safety committees composed of officers and employes. He will also make inspection of the shops, yards and terminals and confer with, advise and assist officers of the various departments in matters pertaining to safety. The safety movement has for its sole purpose the prevention of injuries, in which everyone should fee a personal interest, and we trust that every officer and employe of this system will give to this movement his hearty support and cooperation.

National Transcontinental Railway Coaling Stations.

A contract has been let by the N.T.R. Commission for 200-ton mechanical coaling plants at Monk, Quebec, Fitzpatrick, Parent, Doucet and O'Brien, to the Roberts and Schaefer Co., Chicago, Ill. A condition of the contract is that all the structural work possible must be fabricated in Canada.

The first standard coaling plants on the N.T.R. were of the inclined dock type, that at Cochrane, Ont., being described in Canadian Railway and Marine World for March, 1913. Since then, the standard has been changed to the mechanical type, the plants just contracted for being of this type, which consists of an elevated concrete box structure, 22 ft. square, supported on 6 columns, the box being divided into two sections. The bottom of the box structure slopes towards the track side, with two coaling tracks, one along that side and the other underneath, with a chute to each. To the rear, there is a pit, over which the coal car is run, coal being elevated from the pit into the concrete hopper above by an elevator system. A corrugated iron sand box is attached to the side of the coal box.

Canadian Northern Railway Construction, Betterments, Etc.

Mount Royal Tunnel and Terminal Ry.—The Board of Railway Commissioners has approved revised location of the tunnel line from St Antoine St. to its main line at Montreal and rescinded order made Nov. 27, 1913.

Preliminary plans for the passenger terminals in Montreal have been prepared. They will be located between Cathcart and Lagauchetiere, St. Monique and Mansfield streets, and it is said they will comprise a group of buildings of sonsiderable architectural attractiveness; that the platforms will be 1,200 ft. long, and will be 45 ft. below the upper level at Dorchester St., and 20 ft. above the general level of the city. Press reports, Feb. 13, stated that excavation has been started for the station and terminal buildings, and that the erection of a temporary station will be undertaken as soon as the weather permits. It is expected that passenger trains will be running through the tunnel early in the autumn.

Toronto-Hamilton Line.—A bylaw, submitted to the ratepayers of St. Catharines, Ont., to give a bonus of $100,000 towards the building of the projected railway from Toronto to the Niagara River, was defeated by a vote of 744 to 324, Jan. 31.

Canadian Northern Ontario Ry.—It has been announced that the branch on the Toronto-Sudbury line from Uhthoff into Orillia, will be opened for traffic, Mar. 1.

Montreal-Ottawa-Port Arthur line.—The Board of Railway Commissioners has approved of revised location plans of the line at Grand Lake, in Nipissing District, mileage 126.37 to 129.94 from Ottawa.

We have been officially supplied with the following information with regard to the work done on this line during 1913:—Average force employed for every working day in the year, 6,880 men, and 808 horses; largest force employed in any month, 8,736 men and 1,195 horses; smallest force employed in any month, 3,838 men and 298 horses; outlay in wages, $720,000, equal to about $20,000 each working day; yardage moved, about 11,000,000 cubic yards, equal to 366 miles of completed grade, allowing 30,000 cubic yards a mile, or 1.9 miles of grade for each working day. There were 15¼ million feet of timber built in trestles; 4½ million feet in culverts; 43,399 cubic yards of concrete were put in culverts and bridge foundations; and 2,900 tons of steel were put into the superstructures of bridges. Track was connected upon the Sudbury-Port Arthur section of the line, 550 miles, on Dec. 31, 1913, just 29 months after the grading was commenced.

Canadian Northern Ry.—In a recent interview at Winnipeg, Sir Donald Mann, Vice President, is reported to have said, that the company, before undertaking any new construction, would complete its main line and branches now under construction.

Press reports state that contracts will shortly be let for the construction of a number of large steel bridges on western lines, at a total estimated cost of $4,000,000. These include bridges at Snarling River, Minette, and at Athabaska.

The Manitoba Legislature has passed an act incorporating the Canadian Northern Manitoba Ry. Co. to build the following lines:—From the Oak Point branch of the C.N.R., in tp. 27 or 28, westerly to the eastern shore of Lake Manitoba; from the Oak Point branch near Gypsumville, northerly to the authorized line of the C.N. Ry., between Shevlin and Grandview on the C.N.R., southeasterly to Portage la Prairie; from Portage la Prairie southerly and southeasterly to the C.N.R. between Emerson and Sprague, and such other lines as may be approved from time to time by the Lieutenant-Governor-in-Council. The provisional directors are:—H. Sutherland, P. C. Andrews, E. Langham, O. G. Clark, K.C., C. W. Jackson, Winnipeg.

Sir William Mackenzie, President, is reported to have stated at Winnipeg, Feb. 12, that construction will be proceeded with at once on the new line from Grand Marais to Victoria Beach, and the line from Deerfield to Lake Manitoba. The Manitoba Legislature has passed an act guaranteeing the company's bonds for $13,000 a mile for the building of these two lines, 15 and 12.5 miles long, respectively.

Plans have been deposited in the Land Titles office at Moose Jaw, Sask., showing revised location of the Maryfield branch through tps. 5 and 6, ranges 25-29, west of the 2nd meridian. In connection with this line, Sir Donald Mann is reported to have recently said:—"Our present entrance to Moose Jaw is by the Maryfield branch—a round about route It is likely that we shall come to some arrangement with the G.T. Pacific Ry. in order to secure a more direct entrance, but it will not be yet."

It was understood that the line into Calgary, which, from near Drumheller, Alta., carried traffic coming off the line through from Saskatoon, and the traffic from the line south from Vegreville, would have been opened for traffic Feb. 1. The Board of Railway Commissioners, however, refused to sanction its opening until the temporary bridges east of the city are strengthened. It is expected that operation will be started early in March.

The company has secured, D. B. Hanna, Third Vice President, is reported to have recently said, a site in Calgary for its station, and is going ahead with the preparation of plans for building it.

In connection with the building of a line into Macleod, Alta., press reports, Feb. 9, stated that engineers have been going over the route, on which some grading has been done, between the C.P.R. tracks and the Old Man River, and have been locating a site for the construction of a bridge there.

The proceeds of the bond issue recently placed on the London, Eng., market will be used in the construction of the following lines under agreement between the C.N.R.'s subsidiary, the Canadian Northern Western Ry., and the Alberta government:—From Oliver northeasterly to St. Paul de Metis; from Bruderheim via Vermillion, Wainwright and Medicine Hat to the International boundary, with a branch northeast of Vermillion to the eastern boundary of the province; from Camrose to Alsask; from Calgary northwest to the Brazeau line; from Strathcona southwest via Cochrane to Pincher Creek, and from Athabaska north of Lesser Slave Lake to Peace River Crossing.

The annual report of the Minister of Railways for Alberta for the calendar year 1913, shows that during the year the company built 249 miles of railway in the province. There had been built, or were in process of completion under provincial guarantee the following lines:—

	Guarantee per mile.	Mileage Guaranteed.
CANADIAN NORTHERN RAILWAY—		
Strathcona via Camrose and Calgary to Lethbridge	$15,000	355
Camrose to Vegreville	15,000	45
Crossing of second above line and Little Bow River, south via Macleod to the International boundary	15,000	110
Near Macleod to the Western Boundary	15,000	65
Morinville to Athabasca Landing	15,000	72.3
Mile 175 of the Goose Lake line to Munson	15,000	127.5
CANADIAN NORTHERN WESTERN RY.—		
Onoway northwest to Pine River Pass	$20,000	100
Oliver northeast to St. Paul de Metis.	13,000	100
Bruderheim via Vermilion, Wainwright and Medicine Hat to International boundary, with a branch northwest of Vermilion to Eastern Boundary	13,000	30
Calgary northeast to Brazeau line	13,000	100
Camrose to Alsask	13,000	80
Strathcona via Cochrane to Pincher Creek	15,000	20
Blackfalds to Goose Lake line	13,000	118.5
Total		1,323.3

Steel is reported to have been laid on the Brazeau line to about 45 miles west of Rocky Mountain House, and grading is said to be in progress right through to the Brazeau coal fields. The bridge across the Saskatchewan River on this line, it is reported, will be built jointly with the C.P.R., whose Alberta Central Line parallels the C.N.R. line for a considerable distance.

Canadian Northern Pacific Ry.—The British Columbia Legislature passed an act, Feb. 13, affecting the guarantee of bonds of the company. The Premier stated that it had not been found a workable plan to rank the 4½% securities as provided by the act of 1912, with the 4% securities which were provided for under the original act. The amendment now carried provides that the 4½% securities shall be applied only for the construction of the lines specially mentioned in the act of 1912, viz.:—From the 100-Mile post on the Vancouver Island line to Duncans; from Kamloops to Kelowna, in the Okanagan, with a spur line to Lumby; the branch from New Westminster to Steveston; the line from Patricia Bay to Victoria; the line from New Westminster to Vancouver.

It is reported that there are only about five miles of grading south of the Albreda Summit, B.C., on which no work has yet been done, along the whole line. At this point several routes have been laid out, but a definite decision has not been arrived at as to which will be followed. The remaining portions of the grading, on which track had not been laid up to Dec. 31, 1913, is well advanced to completion. It is expected to have the track laid through early in the fall. (Feb., pg. 73.)

A Victoria, B.C., dispatch of Feb. 21, said that the Premier had introduced a bill in miles, principal and interest at 4½% until 1950, the total amount being $12,360,200 the Legislative Assembly providing that the Province guarantee Canadian Northern Pacific Ry. bonds for $10,000 a mile for 511 The time for the completion of the line is to be extended to 1916.

Government Grain Elevators.—The Minister of Trade and Commerce in response to a letter from the Member of Parliament for North Grey, stated recently, that the Government has no present intention of building elevators at any point on Georgian Bay; the Government's policy, apart from the elevators already built by it, or through commissioners, at Halifax, St. John, Port Colborne, Fort William, Saskatoon, Moose Jaw, Quebec, Montreal, and the erection of another elevator at Calgary, two transfer elevators, one in British Columbia and the other on Hudson Bay, being to leave such construction to private parties or corporations.

The Intercolonial Ry. and Branch Lines.—Replying to a question in the House of Commons, Feb. 2, the Minister of Railways said: "In view of the action of the Senate last session" in throwing out the bill providing for the purchase, under certain conditions, of branch lines, "it is not considered that the introduction of such legislation during the present session would be of any use."

Mainly About Transportation People.

SIR THOMAS TAIT addressed the Canadian Club in Toronto, Feb. 23, on Australia.

JOHN HANNA, Superintendent of Restaurants, Canada Railway News Co., died in Toronto, Feb. 16, aged 58.

W. H. BRODIE, General Passenger Agent, C.P.R., Vancouver, B.C., has returned from a three weeks vacation in California.

C. R. HOSMER, Director, C. P. R., has been re-elected President of the Ritz-Carlton Hotel, Montreal, for the current year.

R. McBeth, who died at Kildonan, Man., recently, was father of R. J. McBETH, City Freight Agent, Canadian Northern Ry., Winnipeg.

SIR RODOLPHE FORGET, President, Quebec Ry. Light, Heat and Power Co., who was recently under treatment for appendicitis, is convalescing.

E. E. BRYDONE-JACK, Professor of Civil Engineering at the University of Manitoba, has been elected a member of the Institution of Civil Engineers.

D. C. COLEMAN, General Superintendent, Alberta Division, C.P.R., Calgary, has presented a silver cup as a trophy to the Mercantile Hockey League there.

The HON. N. CURRY, President, Canadian Car and Foundry Co., and Mrs. Curry, left Montreal Feb. 8 for Bermuda, expecting to return early in March.

ROBERT PICKFORD, who died at Nice, France, in the early part of February, was a few years ago a member of the shipping firm of Pickford and Black, Halifax, N.S.

T. P. PHELAN, President, Canada Railway News Co., and Mrs. Phelan left Toronto, February 15, for Bermuda, intending to return about the middle of March.

H. S. GREENWOOD, M. Can. Soc. C.E., Assistant Chief Engineer of Construction, Mackenzie, Mann & Co., Toronto, and Mrs. Greenwood, are on a trip to Trinidad.

DANIEL PARKER, of the Chicago, Milwaukee and St. Paul Ry.'s passenger department in Winnipeg, dropped dead there, Jan. 27, aged 60. He was born at St. Andrews, Que.

MRS. D. B. HANNA, wife of the Third Vice President, Canadian Northern Ry., slipped on an icy sidewalk in Toronto, Feb. 6, while going to her automobile, and broke her left wrist.

D. POTTINGER, I. S. O., ex-Assistant Chairman, Canadian Government Railways Managing Board, and Mrs. Pottinger, of Moncton, N. B., have been spending part of the winter in Toronto.

V. J. BORLAND, chief clerk to Chief Engineer, Canadian Northern Pacific Ry., Vancouver, B.C., who was slightly injured recently by being thrown from his horse, has recovered and returned to duty.

J. ALEXANDER HUTCHISON, M. D., who resigned his position as Chief Medical Officer, G. T. R., and G. T. Pacific Ry., recently, has been appointed Senior Surgeon of the Montreal General Hospital.

C. W. HUNTINGTON has resigned as General Superintendent of the Central Rd. of New Jersey, to become Vice President and General Manager of the Minneapolis & St. Louis Rd., at St. Louis, Mo.

MORRIS McDONALD, who was elected President of the Boston and Maine Rd., in July 1913, has resigned to devote his whole time to the Maine Central Rd., of which he is President and General Manager.

F. N. HALL, Superintendent, Moncton and Buctouche Ry., Moncton, N.B., was killed with the three members of a snow plough crew, Feb. 20, when a snow plough and locomotive broke through a small bridge at Scotch Settlement, near Moncton.

SIR WM. VAN HORNE, who was confined to his house in Montreal for several weeks by inflammatory rheumatism, had sufficiently recovered to be able to attend the C. P. R. directors' meeting early in February .

HON. FRANK COCHRANE, Minister of Railways and Canals, who has not been in good health for some time, sailed from Halifax, Feb. 28 on the Allan s. s. Alsatian for Liverpool, intending to remain in Europe about two months.

A. P. DANE, Secretary-Treasurer, Master Car and Locomotive Painters Association of the United States and Canada, Reading, Mass., celebrated his golden wedding recently, when a presentation was made by the association at a public reception.

W. G. ROSS, Chairman, Montreal Harbor Commission, with Mrs. Ross and family arrived in London, Eng., during February, and later went on to Nice, France. He will inspect a number of the principal harbors in Europe and will probably return to Montreal in May.

P379 J. W. Norcross,
Managing Director, Canada Steamship Lines, Ltd.

A. LEADLEY, Canadian Agent, Delaware, Lackawanna and Western Rd., Toronto, accompanied by his wife, left on Feb. 18 for a two months' trip to California, travelling by way of Chicago, New Orleans, Los Angeles, San Francisco, Vancouver, and thence back to Toronto by one of the Canadian routes.

A. C. STONEGRAVE, who died at St. Albans, Vt., Feb. 7, aged 71, entered Central Vermont Ry. service in 1843 and, for many years he has been Canadian Freight and Passenger Agent at Montreal. The funeral was attended by the chief G.T.R. officials, as well as a number of other transportation officials.

JAMES B. MACPHERSON, who has been appointed Chief of Tariff Bureau, G.T.R. lines east of Detroit and St. Clair Rivers, with office at Montreal, was born at Montreal, Jan. 31, 1867, and entered G.T.R. service in Apr., 1881, since when he has occupied various positions in the General Freight Department, until Feb. 16, the date of his present appointment.

V. A. HARSHAW, whose appointment as Superintendent, District 1, Atlantic Division, C. P. R., Brownville Jct., Me., was announced in our last issue, entered C. P. R service Oct. 21, 1884, and was for two years, Superintendent, District 1, Ontario Division, Toronto, and for three years prior to Jan. 5, 1914, Superintendent, District 2, Atlantic Division, Woodstock, N. B.

GEORGE ARTHUR STAPLES, who has been appointed Travelling Freight Agent, C.P.R., Vancouver, B.C., was born at Durham, Ont., Feb. 28, 1882, and entered C.P.R service, Mar. 1, 1901, since when he has been, to Aug., 1902, clerk, North Bay, Ont.; Aug. to Dec., 1902, agent and operator, Chapleau, Ont.; Dec., 1902, to Mar., 1903, operator, Winnipeg; Mar., 1903, to Aug., 1907, Freight Agent, Cranbrook, B.C.; Nov., 1907, to Aug., 1911, cashier and chief clerk, Nelson, B.C.; Aug., 1911, to Jan. 31, 1914, Travelling Freight Agent, Nelson, B.C.

JAMES PLAYFAIR, of Midland, Ont., who retired recently from the Managing Directorship of the Richelieu & Ontario Navigation Co., was presented in Toronto with a solid silver centre table piece and rose bowl, with the following inscription: "Presented to James Playfair by the officials, staff, captains, and engineers of the Inland Lines, Ltd., and Northern Navigation Co., Ltd., as a token of the high esteem in which he is held by one and all." An old English chime clock was also presented to Mrs. Playfair.

ALBERT WHITEMAN, who has been appointed General Air Brake Inspector, G. T. Pacific Ry., Transcona, Man., was born at Bruce, Ont., in 1884, and entered railway service in 1903, since when he has been, to Mar., 1907, in C.P.R. service on air brakes, Fort William, Ont.; 1907 to Sept., 1908, in charge of air brake work, Canadian Northern Ry., Winnipeg; Sept., 1908, to Oct., 1913, on air brake work, Motive Power and Car Department, G.T.P.R., Edmonton, Alta., and since then he has been attached to the Car Department at Transcona, Man.

F. W. STERLING, who has been appointed District Freight Agent, C.P.R., Nelson, B.C., was born at Thornbury, Ont., Sept 14, 1881, and entered C.P.R. service in 1895, in the Local Freight office, Vancouver, B.C., where he occupied various positions, from messenger to chief cashier, until 1902; 1902 to 1904, claims clerk, General Freight office, Vancouver, B.C.; 1904 to 1906, chief clerk, General Freight office, Vancouver, B.C.; 1906 to 1909, Contracting Freight Agent, Seattle, Wash.; 1909 to Jan., 1914, Travelling Freight Agent, Vancouver, B.C.

G. G. OMMANNEY, who has been appointed Special Engineer to the President, C.P.R., Montreal, entered C.P.R. service in 1907, making preliminary reports and surveys regarding the development of the company's lake terminal at Port McNicoll, Ont., and subsequently was in charge of construction there until 1911, when he was placed in charge of exploration and reconnaissance work in connection with harbor developments on the Pacific coast. Since 1912 he has occupied the position of Special Engineer, which appointment has now been officially made.

JOHN GORDON, who has been appointed Foreman Electrical Engineer, Car Department, G. T. Pacific Ry., Transcona, Man., was born at Forres, Scotland, Jan., 1884, and after serving an apprenticeship to the electrical and mechanical engineering, served some time in the Electrical Engin-

eering Department, North Eastern Ry., Newcastle, Eng. He entered C.P.R. service in the Motive Power Department, Winnipeg, Man., Sept., 1909, and from Jan., 1910, has been in G. T. Pacific Ry. service, in the Motive Power Department, at Rivers, Man., and Transcona.

REGINALD EGERTON PERRY, who has been appointed Assistant General Freight Agent, Canadian Government Railways, Moncton, N.B., was born at Drayton, Ont., July 5, 1876, and entered railway service Oct. 2, 1891, since when he has been, to Feb. 28, 1898, clerk in various positions, General Freight Department, C.P.R., Toronto; Mar. 1, 1898, to June 30, 1907, in similar capacity, Intercolonial Ry., Montreal; July 1, 1907, to July 31, 1909, Chief of Tariff Bureau, I.R.C., Montreal; Aug. 1, 1909, to Feb. 1, 1914, Assistant General Freight Agent, I.R.C., Montreal.

WILLIAM NOONAN, who has been appointed Chief Engineer, Canada Steamship Lines, Ltd., Toronto, was born at Westport, Ont., Feb. 17, 1864, and entered steamboat service in 1882, since when he has been, to 1887, tug engineer, Graham, Horne and Co., Fort William, Ont.; 1888 to 1889, second engineer, s.s. Sir S. L. Tilley, St. Catharines, Ont.; 1890 to 1894, chief engineer, s.s. Macassa, Hamilton Steamboat Co., Hamilton, Ont.; 1895 to 1911, chief engineer, Hamilton Steamboat Co., Hamilton, Ont.; 1912 to 1913, chief engineer, s.s. Turbinia, Richelieu and Ontario Navigation Co., Toronto.

LEON GEORGE ROGERS, whose appointment as Assistant Superintendent, District 1, Ontario Division, Havelock, was announced in our last issue, was born at Richford, Vt., June 18, 1874, and entered railway service, July 31, 1893, since when he has been, to Aug. 1, 1898, terminal operator, C.P.R., Newport, Vt.; Aug. 1, 1896, to July 13, 1899, terminal operator, C.P.R., Farnham, Que.; July 13, 1899, to Dec. 1, 1910, dispatcher, C.P.R., Farnham, Que.; during the winter of 1902-03, he was dispatcher at Moose Jaw, Sask., and Calgary, Alta.; Dec. 1, 1910, to Jan. 1, 1914, Chief Dispatcher and Trainmaster, District 1, Eastern Division, Farnham, Que.

A. C. DOUGLAS, whose appointment as Purchasing Agent, C. P. R., Vancouver, B C., was announced in our last issue, was born at Montreal, Nov. 10, 1881, and entered C. P. R. service, Nov. 1, 1897, and was, to Oct. 31, 1906, junior clerk in General Storekeeper's office, Montreal, and in various positions in the Stores Department Eastern Lines, and relieving Storekeeper, Eastern Lines; Nov. 1, 1906 to May 31, 1908, senior clerk, General Purchasing Agent's office, Montreal; June 1, 1908 to Mar. 31, 1911, chief clerk, Purchasing Agent's office, Winnipeg; Apr. 7, 1911 to Jan. 31, 1912, chief clerk, Purchasing Agent's office, Vancouver, B. C.; Feb. 1, 1912 to Dec. 31, 1913, Assistant Purchasing Agent, Vancouevr, B. C.

ANDREW WILLIAMS, who has been appointed Superintendent, District 2, Atlantic Division C. P. R., Woodstock, N. B., was born at Mono Road, Ont., Feb. 22, 1872, and entered C. P. R. service, Jan. 1889, since when he has been, to 1892, telegrapher; 1892 to 1893, relieving agent; 1893 to 1894, assistant to car distributor and fuel agent, all Atlantic Division; 1895 to 1896, relieving dispatcher, St. John, N.B.; 1896 to 1898, trick dispatcher, St. John, N. B.; 1898 to 1904, Chief Dispatcher, Woodstock, N. B.; 1904 to 1904, rule instructor, Atlantic Division; 1905 to 1909, Trainmaster, Atlantic Division; 1909 to 1911, Assistant Superintendent, Atlantic Division; 1911 to Jan. 5, 1914, Assistant Superintendent, District 1, Lake Superior Division, North Bay and Sudbury, Ont.

MICHAEL MAGIFF, who has been appointed Superintendent Telegraphs and Superintendent Car Service, Central Vermont Ry., St. Albans, Vt., was born at Ver-Planks Point, N.Y., Mar. 24, 1852, and entered C.V.R. service in May, 1868, since when he has been, to May, 1871, operator at Essex Jct. and Montpelier, Vt.; May, 1871, to Jan., 1874, dispatcher, St. Albans, Vt.; Jan., 1874, to Dec., 1875, chief operator, St. Albans, Vt.; Dec., 1875, to Jan., 1880, Chief Dispatcher, St. Albans, Vt.; Jan. 1, 1880, to Jan., 1890, Superintendent Telegraphs and General Train Dispatcher, St. Albans, Vt.; Jan., 1890, to Jan., 1899, Superintendent Telegraphs and General Car Agent, St. Albans, Vt.; Jan., 1899, to Feb. 1, 1914, Superintendent Telegraphs and Car Accountant, St. Albans, Vt.

W. J. PICKRELL, who was recently appointed Assistant and Superintendent, District 2, Atlantic Division, Aroostook, N.B., was born at London, Ont., Sept. 15, 1880, and entered C.P.R. service Jan. 1899, since when he has been, to July 1, 1901, in West Toronto shops; July 1, 1901, to Nov. 1, 1904,

P380 W. E. Burke,
Assistant Manager, Canada Steamship Lines, Ltd.

Foreman, West Toronto; Nov. 1, 1904, to July 7, 1905, travelling fireman; July 7, 1905, to Aug. 1, 1907, locomotive driver; Aug. 1, 1907, to Apr. 15, 1908, assistant road foreman of locomotives; Apr. 15, 1908, to May 10, 1910, locomotive driver; May 10 to Dec. 16, 1910, rule instructor; Dec. 16, 1910, to Apr. 9, 1912, locomotive driver; Apr. 9 to May 15, 1912, Assistant District Master Mechanic, District 3, Ontario Division; May 15, 1912, to Nov. 1, 1913, District Master Mechanic, District 1, Ontario Division, West Toronto.

ROBERT KELLOCK GEMMEL, who has been appointed Local Freight Agent, Milland Ry. of Manitoba, Winnipeg, was born at Perth, Ont., Mar. 10, 1886, and entered railway service, Feb. 11, 1907, since when he has been, to Dec. 1908, stenographer and clerk, Superintendent's office, Minnesota and International Ry., Brainerd, Minn.; Dec. 1908 to July 1910, stenographer and clerk, Tie and Treating Department, Northern Pacific Ry., Brainerd, Minn., and Paradise, Mont.; July 1910 to Mar. 1911, stenographer and material clerk, Superintendent's office, Northern Pacific Ry., Duluth, Minn.; Mar. 1911 to May 1912, chief clerk, Duluth Union Depot and Transfer Co Duluth, Minn.; May 1912 to Jan. 31, 1914, Auditor and chief clerk to General Superintendent, Midland Ry. of Manitoba, Winnipeg, Man.

W. E. BURKE, whose appointment as Assistant Manager, Canada Steamship Lines, Montreal, was announced in our last issue, and whose portrait appears in this issue, was born at Belleville, Ont., Sept. 23, 1881, and entered transportation service May 1, 1905, since when he has been, to Dec. 1, 1905, purser on s.s. Picton, Richelieu and Ontario Navigation Co., Montreal and Toronto; Dec. 1, 1905, to Dec. 31, 1906, Soliciting Freight Agent, R. & O. N. Co., Toronto; Dec. 31, 1906, to Dec. 31, 1907, Travelling Freight Agent, same company, Toronto; Dec. 31, 1907, to Apr. 19, 1909, Travelling Freight Agent, Mutual Steamship Co., Toronto; Apr. 10, 1909, to Apr. 1, 1910, General Freight Agent, Merchants Mutual Line, Toronto; Apr. 1, 1910, to Jan. 1, 1914, Traffic Manager, Merchants Mutual Line, Toronto.

R. W. DREW, who has been appointed Division Freight Agent, Saskatchewan Division, C.P.R., Regina, was born at Kingston, Ont., Feb. 17, 1874, and entered railway service May, 1894, since when he has been, to May, 1896, clerk general office, operator and agent at various points, Kingston and Pembroke Ry.; June, 1896, to Sept., 1898, clerk, C.P.R., Arrowhead, B.C.; Sept., 1898, to Apr., 1903, Local Agent, C.P.R., Nelson, B.C.; Apr., 1903, to Apr., 1908, chief clerk, General Freight Agent's office, Nelson, B.C.; Apr. to June, 1908, acting General Freight Agent, Kootenay and Boundary Divisions, C.P.R., Nelson, B.C.; June, 1908, to May 30, 1911, District and Travelling Freight Agent, C.P.R., Saskatoon, Sask.; May 30, 1911, to Jan., 1914, Division Freight Agent, Kootenay and Boundary Divisions, C.P.R., Nelson, B.C.

Capt WILLIAM RICHARDS, for many years President, Charlottetown Steam Navigation Co., Charlottetown, P.E.I., who died in Montreal, Feb. 16, was born at Swansea, Wales, May 15, 1819, and was educated there and in Ireland. His early life was spent at sea, and he commanded a square rigged ship at the age of 23. He went to Prince Edward Island in 1844 and commenced a shipbuilding business at Bideford, in conjunction with the late Hon. Jas. Yeo, whose daughter he married. In the course of that business he launched about 100 vessels, varying from 500 to 1,500 tons, at a time when wooden sailing vessels constituted the greater proportion of the mercantile service of British North America. He was elected to the Legislature in 1870, and was a supporter of Confederation. He paid frequent visits to Great Britain up to 1912. The funeral took place in Prince Edward Island.

W. P. HINTON, who has been appointed Assistant Passenger Traffic Manager, G.T. Pacific Ry., Winnipeg, and whose portrait appears in this issue, was born at Hintonburg, Ont., Aug. 30, 1871, and entered railway service, May, 1887, since when he has been, to Aug., 1891, clerk, freight, passenger and car accounts, and travelling auditor, Canada Atlantic Ry.; Aug., 1891, to Mar., 1898, rate clerk, General Freight and Passenger departments, same road, and accountant, Canada Atlantic Fast Freight Line; Mar., 1898, to June 30, 1901, Assistant General Freight Agent, same road, and Canada Atlantic Transit Co.; June 30, 1901, to Jan. 30, 1903, General Freight Agent, same road; Jan. 30, 1903, to Oct., 1905, General Passenger and Freight Agent, same road; Oct., 1905, to Jan., 1907, General

Agent, Passenger Department, G.T.R., Ottawa; Jan., 1907, to Apr., 1909, Assistant General Passenger and Ticket Agent, same road, Montreal; Apr., 1909, to Feb., 1914, General Passenger Agent, G.T. Pacific Ry., Winnipeg.

L. C. RUSSELL, Travelling Passenger Agent, G.T.R., Chicago, Ill., died there, Feb. 5.

J. A. Timmerman, who died at Kingston, Ont., Feb. 15, aged 64, was a brother of H. P. TIMMERMAN, Industrial Commissioner, C.P.R., Montreal.

GIDEON SWAIN, who was in C.P.R. service for about 30 years, during the latter part of which he was station agent at Winnipeg, died at Montreal, Feb. 4, aged 87.

HON. J. A. REID, Minister of Customs, is acting as Minister of Railways and Canals during the absence in Europe of the Hon. F. Cochrane.

C. E. HORNING, District Passenger Agent, G.T.R., Toronto, was entertained to dinner by a number of friends, Feb. 9, on the 36th anniversary of his entering the company's service.

SIR THOMAS SKINNER, director, C.P.R., London, Eng., has been elected Governor of the Hudson's Bay Co., in place of the late Lord Strathcona; and A. M. NANTON, Chairman of the Advisory Committee in Winnipeg, and formerly Managing Director Alberta Railway and Coal Co., has been elected a director.

J. W. STEWART, of Foley, Welch and Stewart, railway contractors, Vancouver, B.C., is said to have purchased an estate in Sutherlandshire from the Duke of Sutherland for about $300,000. The matter is now in the Scottish law courts, as, on account of the property being entailed, legal proceedings are necessary before it can be sold.

FREDERICK H. CLENDENNING, who has been appointed Division Freight Agent, British Columbia Coast Steamship Service, and Ocean Steamship Lines, C.P.R., Vancouver, B.C., was born at Montreal, Nov. 9, 1881, and entered C.P.R. service, Aug. 1, 1898, since when he has been, to June 30, 1902, junior clerk, Fourth Vice President's office, register clerk, and stenographer, Montreal; July 1, 1902, to Mar. 31, 1903, stenographer and freight clerk, Commercial Agent's office, New York Central and Hudson River Rd., Montreal; Apr. 1, 1903, to Jan. 31, 1904, stenographer, rate and tracing clerk, General Freight Department, C.P.R., Vancouver, B.C.; Feb. 1, 1904, to June 30, 1905, chief clerk, City Freight office, C.P.R., Victoria, B.C.; July 1, 1905, to Aug. 31, 1908, chief clerk, District Freight Agent, C.P.R., and Esquimalt and Nanaimo Ry., Victoria, B.C.; Sept. 1, 1908, to Aug. 16, 1909, City Freight Agent, C.P.R., and District Freight Agent, Esquimalt and Nanaimo Ry., Victoria, B.C.; Aug. 17, 1909, to Mar. 31, 1911, Assistant General Freight Agent, C.P.R., Vancouver, B.C.; Apr. 1, 1911, to Jan. 31, 1914, District Freight Agent, C.P.R., Vancouver, B.C.

D. C. MACDONALD, whose appointment as Assistant General Claims Agent, C.P.R., Winnipeg, was announced in our last issue, was born at Elmsdale, N. S., Feb. 9, 1874, and entered railway service, Sept. 17, 1890, since when he has been, to Sept. 1891, operator at various points, Intercolonial Ry.; Sept. 1891 to Nov. 1893, assistant agent, I. R. C., Sackville, N. B.; Nov. 1893 to June 1894, clerk in Freight Department, I. R. C., Halifax, N. S.; June to Oct. 1894, freight clerk, I. R. C., St. John, N. B.; Oct. 1894 to June 1896, freight clerk and wharf ticket agent, I. R. C., Halifax, N. S.; Jan. 1896 to Mar. 1897, agent, I. R. C., Dartmouth, N. S.; Mar. 1897 to Apr. 1898, freight clerk, I. R. C., Halifax, N. S.; Apr. to Dec. 1898, City Ticket Agent, I. R. C., Halifax, N. S.; Dec. 1898 to Oct. 1899, chief clerk, Freight Department, I. R. C., Halifax, N.S.; Dec. 1900 to Nov. 1901, Freight Agent, I. R. C., Sydney, N. S.; Nov. 1901 to July 1905, Freight Agent, I. R. C., Halifax, N. S.; July 1905 to Jan. 1906, clerk, General Freight Department, C. P. R., Winnipeg; Jan. to Dec. 1906, Travelling Freight Agent, C. P. R., Winnipeg; Dec. 1906 to Apr. 1907, chief clerk, General Freight Department, C. P. R., Winnipeg; Apr. 1907 to June 1911, City Freight Agent, C. P. R., Winnipeg; June 1911 to Jan. 1914, Division Freight Agent, C. P. R., Regina, Sask.

GEORGE BAZZARD, who died at Hamilton, Ont., Feb. 13, was born at Westhide Court, Herefordshire, Eng., Jan. 3, 1838, and until his retirement at the end of 1903, had been continuously engaged in railway service in Great Britain and Canada, since 1856. He commenced service with the South Wales Ry., now part of the Midland Ry., at Swansea, Wales, as General Agent, Sept., 1856, transferring in the following year, to the Newport, Abergavenny and Hereford Ry., in a similar capacity, and remained for six years, during which period he had charge of the traffic over the Crumlin viaduct. In 1863 he entered the service of the Monmouthshire Ry. and Canal Co., and subsequently was appointed Joint Agent of the Brecon and Merthyr Ry., Hereford, Hay and Brecon Ry., and Mid Wales Ry., at Brecon, Wales; later he joined the North Staffordshire Ry. at Burslem and Tunstall, Staffs., and came to Canada in 1876. He was appointed agent, Great Western Ry., with office in Yonge St., Toronto, and remained with the G.T.R., when it absorbed the G.W.R., in 1882, subsequently spending four years in Toronto as Freight and Passenger Agent, Chicago, Rock Island and Pacific Ry., and from 1886 he was Freight and Passenger Agent, Delaware, Lackawanna and Western Rd., Toronto, from which position he retired in Dec., 1903.

Grand Trunk Railway Betterments, Construction, Etc.

Lachine, Jacques Carter and Maisonneuve Ry.—An extension of time for the building of this railway in Montreal is being asked for from the Dominion Parliament. The surveys have been completed and the main portion of the route approved of, but certain negotiations are still in progress. There has been a lengthened fight in connection with the acquisition of some of the properties required for the right of way. The Quebec Supreme Court gave judgment in one of these cases, Feb. 5, holding that when the company complied with certain formalities under the expropriation act it acquired right and title to the property sought to be secured. The action was therefore dismissed.

Hamilton, Yards, etc.—It was reported in Hamilton, Ont., Feb. 3, that the G.T.R. had given instructions that certain lands on Ferguson Ave., were to be taken over, at the figures fixed on at a recent arbitration. The owners of the properties objected to the noises arising from the shunting, etc., in the yards, and arbitration proceedings were instituted to fix a value. The price fixed is said to be $96,378. One of the owners did not object to the noise, and another owner is appealing to the Board of Railway Commissioners against his exclusion.

London, Ont.—We are officially advised that nothing definite has been decided with regard to a projected extension of the line to the Harris farm, London, Ont. Press reports stated that a line of about two miles was to be built at once to the farm, where a racing track was to be laid out.

Press reports state that H. E. Whittenberger, Superintendent, while in London, Feb. 13, stated that the company will confer shortly with the London St. Ry. on the question of building subways at Richmond, Talbot or Ridout streets, and that tests of the ground will be made in the spring, and later on definite proposals will be made.

The Erie, London and Tillsonburg Ry. Co. was originally chartered in 1906, and the route from Port Burwell to London surveyed. The charter was subsequently acquired by the G.T.R., and extensions of time for construction were obtained in 1908, 1910 and 1912. A further extension is now being asked from the Dominion Parliament.

Owen Sound Station.—Plans which have been approved for the erection of a new station at Owen Sound show a two story building 175 by 40 ft., of pressed brick with slate roof. It is expected that construction will be started in May, and the new station opened within the year. (Jan., pg. 23.)

Great Northern Railway Lines in Canada.

Midland Ry. of Manitoba.—Manitoba Great Northern Ry.—The Winnipeg Board of Works has refused to allow the building of an elevated sidewalk on Ross St., alongside a fruit warehouse in course of erection on the terminals used by these companies in Winnipeg.

New Westminster to Blaine.—Press reports state that arrangements are being made for the building of a second track from New Westminster, B.C., to Blaine, Wash.

Vancouver Terminals.—Construction has been started on the viaducts over the Grandview cutting at Broadway and Victoria drives, Vancouver. The steel work is being erected by the Canadian Northwest Steel Co.

The company's new dock at the foot of Campbell Ave., Vancouver, has been completed, and was put into use, Feb. 5. There are two piers, each 450 by 127 ft., on which are warehouses, each 400 by 100 ft. Between the piers are three sets of tracks, and there is another set, along the water front of each warehouse. There is a driveway from the water front to each warehouse. The dock is constructed on wooden piers, concrete cylinders, with concrete and wood facings, while the buildings are of iron and wood, with a flat roof and syklights. The new dock gives accommodation for three steamers of the largest size, one at each side, and one across the end. (Feb., pg. 74.)

Steam Railway track laid in 1913.—We have received the final revised statement showing the track laid during 1913 on the Kettle Valley Lines under construction in British Columbia. This shows:—Between Midway and Penticton, 37 miles; between Penticton and Merritt, 32 miles; Coldwater Jct., towards Hope, 11 miles; total 80 miles. The estimated mileage last used in our table was 75 miles. This revision adds five miles to the total figures in the table given in our February issue, making a total of 3,218.67 miles of new single track laid in Canada in 1913.

Proposed Electrification of C.P.R. Tunnel through the Selkirks.—G. Bury, Vice President, C.P.R., who was in Montreal, Feb. 20, left on that day for New York, where, it is reported, he was to consult with experts in regard to the electrification of the Rogers Pass tunnel, now under construction.

The C.P.R. Engineering Department held its annual dinner at the Place Viger Hotel, Montreal, Feb. 15.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Board of Railway Commissioners.—GEORGE SPENCER, who has recently been acting as Assistant Chief Operating Officer, Winnipeg, has been appointed Chief Operating officer, vice A. J. Nixon, deceased. Office, Ottawa.

Canada Steamship Lins, Ltd.—J. W. HAZLETT has been appointed Chief Engineer, Lines East of Kingston. Office, Montreal.

W. NOONAN has been appointed Chief Engineer, Hamilton, Niagara and Toronto-Prescott Lines. Office, Toronto.

Canadian Government Railways. — J. E. LONG has been appointed Safety Engineer, in charge of the Safety First movement, to organize committees and direct meetings in connection therewith. Office, Moncton. N.B.

A. J. GRAY has been appointed Division Freight Agent, St. John, N.B., vice S. G. Tiffin, transferred to Montreal.

R. E. PERRY, heretofore Assistant General Freight Agent, Intercolonial Ry., Montreal, has had his office moved to Moncton, N.B., and has had his jurisdiction extended over the Prince Edward Island Ry.

S. G. TIFFIN, heretofore Division Freight Agent, St. John, N.B., has been appointed Division Freight Agent in charge of territory in Quebec and in Ontario west to Kingston and Sharbot Lake, inclusive. Office, Montreal.

See also Intercolonial Ry.

Canadian Northern Ry.—Press reports from Winnipeg, state that it is reported locally that R. J. MACKENZIE, son of the President, will shortly be appointed Second Vice President, with office at Winnipeg.

W. F. BARRY heretofore Commercial Agent, St. Louis, Mo., has been appointed City Freight Agent, Montreal.

H. M. POTTICARY, heretofore Soliciting Freight Agent, Toronto, has been appointed Soliciting Freight Agent, Montreal, vice W. H. Thompson, resigned.

The position of District Freight Agent, Montreal, formerly held by F. A. SHAW, whose appointment as Division Freight Agent, Toronto, was announced in our last issue, has been abolished.

R. F. CLARK, heretofore Travelling Agent., Chicago, Ill., has been appointed General Agent at Pittsburgh, Pa., vice A. E. Hodgins, resigned.

F. G. WOOD, heretofore Commercial Agent at Pittsburgh, Pa., has been appointed Commercial Agent at St. Louis, Mo.

Canadian Pacific Ry.—W. J. PICKRELL, heretofore District Master Mechanic, District 1, Ontario Division, West Toronto, has been appointed Assistant Superintendent, District 2, Atlantic Division, and the position of Trainmaster for that district, heretofore held by B. A. Craig, has been abolished. Office, Aroostook, N.B. This appointment was made Nov. 1, 1913, but owing to an oversight, the circular covering it did not reach this office.

J. H. GUTHRIE has been appointed Roadmaster, Division 5, District 2, Atlantic Division, vice W. Hacking. Office, Aroostook Jct., N.B.

J. J. MORGAN, heretofore dispatcher, has been appointed Chief Dispatcher, Farnham, Que., vice L. G. Rogers, promoted.

G. G. OMMANNEY, who has, since 1912, been acting as a special engineer for the company, has been appointed Special Engineer to the President, performing such duties as may be assigned to him from time to time. Office, Montreal.

W. E. WOODHOUSE, heretofore Assistant Superintendent of Motive Power, Western Lines, Winnipeg, has been appointed Superintendent of Motive Power, Eastern Lines. Office, Montreal.

H. OSBORNE, heretofore Assistant Superintendent of Motive Power, Eastern Lines, has been appointed Assistant Mechanical Superintendent, Eastern Lines, and his former position has been abolished. Office, Montreal.

G. McBRIDE has been appointed Night Foreman at North Bay, Ont.

J. A. MOORE has been appointed Car Foreman at White River, Ont., vice F. Guy, assigned to other duties.

R. PRESTON, heretofore Master Mechanic, Manitoba Division, Winnipeg, has been appointed Assistant Superintendent of Motive Power, Western Lines, vice W. E. Woodhouse, promoted. Office, Winnipeg.

F. R. PENNEFATHER, heretofore District Master Mechanic, Cranbrook, B.C., has been appointed Master Mechanic, Manitoba Division, vice R. Preston, promoted. Office, Winnipeg.

P381 V. A. Harshaw,
Superintendent, Dictrict 1, Atlantic Division, Canadian Pacific Railway.

W. B. LANIGAN, Assistant Freight Traffic Manager, Western Lines, Winnipeg, has announced that, from Feb. 1, the British Columbia Division will include rail, lake and river lines, Ottertrail to Vancouver, Passburg to Midway, inclusive, and all intervening territory. The western limit of the Alberta Division has been extended to include Field, B.C.

R. W. DREW, heretofore District Freight Agent, Kootenay and Boundary District, Nelson, B.C., has been appointed Division Freight Agent, Saskatchewan Division, vice D. C. Macdonald, transferred. Office, Regina.

J. H. INGRAM has been appointed Travelling Freight Agent, Saskatchewan Division. Headquarters, Regina.

J. ROBERTSON, heretofore Assistant Division Engineer, Alberta Division, Calgary, has been appointed Assistant Division Engineer, Saskatchewan Division, vice H. B. Sims, transferred. Office, Moose Jaw.

T. LEES, heretofore Assistant Engineer. Vancouver, B.C., has been appointed Assistant Division Engineer, Alberta Division, vice J. Robertson, transferred. Office, Calgary.

H. B. WALKEM, M. Can. Soc. C.E., heretofore Assistant Division Engineer, British Columbia Division, Vancouver, has been appointed Resident Engineer, Kootenay and Boundary Division. Office, Nelson, B.C.

F. W. STERLING, heretofore Travelling Freight Agent, Vancouver, B.C., has been appointed District Freight Agent, Kootenay and Boundary District, vice R. W. Drew, promoted. Office, Nelson, B.C.

The position of General Roadmaster, District 3, British Columbia Division, Nelson, heretofore held by A. Larsen, has been discontinued for the present. The roadmasters on this district, with their territory, are as follows:—Farron to Midway, including Phoenix and Motherlode Branches, E. B. HALL, Roadmaster, Grand Forks; Rossland Branch and Boundary from Castlegar to Farron, Assistant Roadmaster, R. MARIANI, Smelter; Columbia and Kootenay Branch, Slocan Lake Branch, Nakusp and Slocan Branch, Proctor Branch and Lardo Branch, Roadmaster, H. BECK, Slocan City.

H. B. SIMS, heretofore Assistant Division Engineer, Saskatchewan Division, Moose Jaw, has been appointed Assistant Division Engineer, British Columbia Division, vice H. B. Walkem, transferred. Office, Vancouver. In our last issue the name was inadvertently given as C. J. Simms.

W. J. RENIX, heretofore General Foreman, Sutherland, B.C., has been appointed District Master Mechanic, Cranbrook, B.C., vice F. R. Pennefather, promoted.

C. PERRY, heretofore Shop Foreman, Brandon, Man., has been appointed General Foreman, Sutherland, B.C., vice W. J. Renix, promoted.

F. H. CLENDENNING, heretofore District Freight Agent, B.C. Coast Service and Trans-Pacific Steamships, Vancouver, B.C., has been appointed Division Freight Agent, in charge of B.C. Coast and Transpacific traffic. Office, Vancouver, B.C.

G. A. STAPLES has been appointed Travelling Freight Agent, British Columbia Division, Vancouver, vice F. W. Sterling, promoted.

Capt. BEETHAM, heretofore in command of the company's s.s. Empress of Russia, has been appointed Marine Superintendent, Vancouver, B.C.

Central Vermont Ry.—S. S. RUSSELL, heretofore General Superintendent of Transportation, has been appointed Superintendent, Northern Division, vice J. F. Keefe. Office, St. Albans, Vt.

J. F. KEEFE, heretofore Superintendent, Northern Division, has been appointed Assistant Superintendent, Northern Division. Office, St. Albans, Vt.

M. MAGIFF, heretofore Superintendent of Telegraphs and Car Accountant, has been appointed Superintendent of Car Service and Telegraphs. In addition to the superintendency of telegraph matters, he will have charge of car service and car accounting. Office, St. Albans, Vt.

S. E. McKENNEY, heretofore Trainmaster, Palmer, Mass., has been appointed Terminal Trainmaster, vice F. J. McEnany, promoted. Office, St. Albans, Vt.

F. J. McENANY, heretofore Terminal Trainmaster, St. Albans, Vt., has been appointed General Agent in charge of local freight and customs work. Office, St. Albans, Vt.

The positions of Trainmaster, Southern Division, and of Districts 3 and 4, Northern Division, and of Customs Agent at St. Albans, have been abolished.

MARCUS ALEXE is reported to have been appointed Canadian Freight and Pas-

senger Agent, vice A. C. Stonegrave, deceased. Office, Montreal.

Dr. ALAN DAVIDSON has been appointed Chief Surgeon, vice Dr. Alex. Hutchison, resigned. Office, St. Albans, Vt.

Dr. ARTHUR O. MORTON has been appointed Chief Oculist, vice Dr. G. Carleton Berkeley, resigned. Office, St. Albans, Vt.

Grand Trunk Pacific Ry.—R. W. MOORE, heretofore Foreman at Rivers, Man., has been appointed Car Foreman, Westfort, Ont., vice W. Cash, resigned.

W. P. HINTON, heretofore General Passenger Agent, Winnipeg, has been appointed Assistant Passenger Traffic Manager. Office, Winnipeg.

V. P. CUMBERLAND has been appointed Resident Engineer at Rivers, Man., vice J. N. de Stein, transferred.

H. EVANS, heretofore Assistant Foreman, has been appointed Foreman at Rivers, Man., vice R. W. Moore, transferred.

D. W. HAY, heretofore Locomotive Foreman, Redditt, Ont., has been appointed Locomotive Foreman, Jasper, B.C., vice F. Lozo, transferred.

F. LOZO, heretofore Locomotive Foreman, Jasper, B.C., has been appointed Locomotive Foreman, McBride, B.C., vice A. H. Mahan, transferred.

A. H. MAHAN, heretofore Locomotive Foreman, McBride, B.C., has been appointed Locomotive Foreman, Prince George, B.C.

H. SAUNDERS, heretofore Car Foreman, McBride, B.C., has been appointed Car Foreman, Fort George, B.C.

H. DARLING, heretofore acting Locomotive Foreman, Pacific, B.C., has been appointed Locomotive Foreman, Smithers, B.C.

G. McNEIL has been appointed acting Locomotive Foreman, Pacific, B.C., vice H. Darling, transferred.

A. K. LEIGHS has been appointed Car Foreman, McBride, B.C., vice H. Saunders, transferred.

Grand Trunk Ry.—C. W. JOHNSTON, heretofore chief clerk to Passenger Traffic Manager, has been appointed Assistant to Passenger Traffic Manager. Office, Montreal.

J. B. MACPHERSON, heretofore chief rate clerk, Freight Department, has been appointed Chief of Tariff Bureau for lines east of Detroit and St. Clair Rivers. Office, Montreal. This is a new position.

S. E. DEWEY, heretofore Commercial Agent, Pittsburgh, Pa., has been appointed Commercial Agent, All Rail Lines, operating via the Niagara Frontier, New York. Office, 290 Broadway. This is a new position.

D. M. CRAWFORD has been appointed Commercial Agent, Pittsburgh, Pa., vice S. E. Dewey, transferred to New York.

R. McC. SMITH is reported to have been appointed City Passenger and Ticket Agent, Detroit, Mich., vice C. M. Harwood, retired.

Great Northern Ry.—A press dispatch from New York, Feb. 4, stated that CARL R. GRAY, President, had resigned. The Secretary, in answer to an enquiry, wrote us, Feb. 18, that he was still President.

Intercolonial Ry.—JASPER DAVISON has been appointed Standard Rule Instructor, District 2, St. Flavie, Que., to Moncton, N.B., with headquarters at Campbellton, N.B.

R. G. GAGE, heretofore Signal and Chief Engineer, General Railway Signal Co. of Canada, Lachine, Que., has been appointed Signal and Electrical Engineer, I.R.C. Office, Moncton, N.B.

See Canadian Government Railways.

Midland Ry. of Manitoba.—R. K. GEMMELL, heretofore Auditor and chief clerk to General Superintendent, has been appointed Local Freight Agent, Winnipeg, vice C. H. Booth, resigned to enter private business. The report that A. Campbell had been appointed to this position, mentioned in our last issue, was incorrect.

R. G. THACKRAY has been appointed chief clerk and Auditor, vice R. K. Gemmell, appointed Local Freight Agent. Office, Winnipeg.

Pere Marquette Rd.—W. C. ATHERTON, Purchasing Agent, has also been appointed General Storekeeper, vice J. H. Hollub. Office, Detroit, Mich.

Prince Edward Island Ry.—See Canadian Government Railways.

Reid Newfoundland Co.—W. E. LADLEY, Superintendent of Motive Power, has had his jurisdiction extended to cover the superintendence of the company's dry dock at St. John's.

Toronto, Hamilton and Buffalo Ry.—H. T. MALCOLMSON, whose appointment as Superintendent of Car Service, Hamilton, Ont., was announced in our last issue, will continue to have charge of car accounting work, as hitherto, and no appointment will be made to succeed him as Car Accountant.

P157 W. P. Hinton,
Assistant Passenger Traffic Manager, Grand Trunk Pacific Railway.

Railway Finance, Meetings, Etc.

Atlantic, Quebec and Western Ry.—The Joint Trustees for the liquidation of the Charing Cross Bank, London, Eng., in declaring a second dividend of 8d. in the £, state that the principal remaining asset of the bank is the interest on the A. Q. and proximate expenditure, £815,652. Other W. Ry., valued at the amount of the assets in Canada consist of £7,000 of 1st mortgage gold bonds of the Quebec Oriental Ry., and freehold plots with water rights on the Gaspe foreshore. The A. Q. and W. Ry. showed a loss of approximately $50,000 for the financial year ended June 30, but it was anticipated that the loss would be less during this year. The selling of the line at a satisfactory price at the earliest possible moment was a matter to which the closest attention was being given by the trustees. Since the beginning of the liquidation, the trustees had received £39,215 14s 2d. interest on the bonds of the A. Q. and W. Ry., and interest on these bonds is provided for until 1915 out of cash subsidies in the hands of trustees for the debenture bondholders. The trustees had provided out of the funds of the estate, £44,665 for the completion and equipment of the line. Further sums for betterment and equipment would probably be required unless an early sale of the line were made.

Canadian Northern Ry.—There was deposited with the Secretary of State at Ottawa, Feb. 4, a trust deed, dated Nov. 19, 1913, made between the C. N. R. Co., Mackenzie, Mann & Co., the British Empire Trust Co., and the National Trust Co., securing an issue of £3,500,000 of 5% land mortgage debentures.

An issue of £1,320,000 of 4½ guaranteed first mortgage debenture stock was placed on the London, Eng., market, Feb. 7, at 93, by Lazard Bros. & Co. The proceeds of the issue are to be used by certain of the company's Alberta lines building under the title of the Canadian Northern Western Ry.

The company is applying to the Dominion Parliament for an act "defining the manner of execution of the company's securities and the denomination of issue," of its stock.

Canadian Pacific Ry.—The first instalment of 32% of the issue of $25,000,000 of notes, at 80, amounting to $16,640,000, was due Feb. 2. It was reported that approximately $35,000,000 was paid in, shareholders taking advantage of the company's offer to pay 6% on prepaid instalment. The balance is due Mar. 2.

Canadian Pacific Ry.—The following dividends have been declared:—On the preference stock, 2% for the half year ended Dec. 31, and on the common stock, 2½%, for the quarter ended Dec. 31, being at the rate of 7% per annum from revenue, and 3% per annum from special income account. The dividends are payable Apr. 1, to shareholders of record on Feb. 28.

Grand Trunk Ry.—The Dominion Parliament is being asked to authorize the doing away of the present system of half yearly meetings in favor of an annual meeting of shareholders to be held in March or April, for the payment of interim dividends, for the issue of additional consolidated debenture stock the interest charge on which at 4% shall not exceed £100,000 a year. The act shall not come into force until it has been approved by a majority of shareholders present personally or by proxy at a meeting specially convened.

Grand Trunk Ry.—The full dividend for the half year ended Dec. 31, 1913, has been declared on the 4% guaranteed stock, and on the first and second preference stock, and 2½% for the year on the third preference stock. After payment of these dividends, $83,000 is carried forward to the current half year. The gross receipts for the half year were $23,844,500, and the expenses $17,800,000; the total net receipts, including income from rentals, etc., being $6,097,250.

Montreal Elevator Rates.—The Montreal Board of Trade Transportation Bureau and the Montreal Corn Exchange Association have applied to the Board of Railway Commissioners for an order to reduce the rates at the Montreal Warehousing Co.'s elevator at Montreal, to the same scale, on ex-water grain shipped by car, as charged at the G.T.R. elevators on Georgian Bay. As it is claimed that the G.T.R. controls the Montreal Warehousing Co., it has been made a party to the hearing, which is set down for Mar. 10 at Ottawa.

An order has been placed in Oregon for 10,000,000 ft. of creosoted ties for India and it is said further large orders will be placed. Two tank steamships are on the way from Amsterdam with creosote destined for St. Helens, Ore.

Electric Railway Department

Motor and Trailer Cars for Montreal Tramways Company.

As previously mentioned in these columns, the Montreal Tramways Co., a short time ago, ordered 25 motor cars, and 25 trailers, which have been delivered, and are illustrated herewith. The operating conditions on the Montreal streets have on several occasions been discussed in this paper. On St. Catherine St., the main thoroughfare across the city, there is a heavy traffic at all hours of the day, to serve which, there has up to the present been a 1½ minute headway, with single car operation. In view of the nearly constant volume of traffic handled on the line at all hours, consideration of the problem of how to meet increasing traffic on that thoroughfare counselled the use of trailer cars, as with the conditions as they exist, it would be possible to send out the motor and waiter as a unit in the morning, leaving it in service all day, instead of having to attach and remove the trailer at different periods of the day as is the usual practice. This latter has been one of the principal objections to the use of the trailer system. Another advantage in the use of trailers for this service arises from the fact that the volume of traffic being such as to make practicable the use of trailers, the operating cost per passenger is materially decreased.

Motor Trailer Unit, Montreal Tramways Co.

The motor and trailer cars are almost identical in general design, and are of the same type as the last batch of cars recently built for the company. The original of this type was described in considerable detail in Canadian Railway and Marine World for March, 1912. The type of semi steel cars in use in Montreal up to that time had followed conventional lines, corresponding for the most part to the existing practice in all wood construction. As at that time it was expected that a large number of new cars would be added to the equipment, as has since been done in the last two years, a completely new design of car was developed by D. E. Blair, Superintendent of Rolling Stock, in which former practice was largely discarded, and a new car developed, which was not only stronger, but lighter. Another very important factor considered, and which in the design of the car was developed to a high degree, was the making of the car easy of repair in the event of accident. As completed at that time, and described in the article referred to, the car was a considerable advance on the company's previous practice.

Cars subsequently built to the same fundamental design have had changes introduced as the initial design developed points of weakness, or places where they could be improved upon. The design of the body frame of the car has been left unaltered. the principal changes covering the vestibules and fittings. One of the most apparent changes is the substitution of the monitor for the clerestory roof, which was made in an order delivered about a year ago. The seating capacity of the car, while the same as in the initial design, has been altered. Originally, the cross seats were located in the centre of the car, but as this had a tendency to cramp the standing passengers in the rush hours, to the rear of the cross seats in the longitudinal seat section at the back, leaving the longitudinal seat section at the front practically empty of standing passengers, recent designs have had the cross seats moved forward, with a very short longitudinal seat at the front, the rear one extending half the length of the car. The front vestibule arrangement on the original cars, wherein the motorman was separated from the main part of the platform by a glass and frame partition, was shortly afterwards superseded by a pipe frame and chain arrangement.

The framing of both the motor and trailer cars is identical and corresponds to that of the original design, being composed entirely of plates and structural shapes. Both motor and trailer cars have side sills formed of a depth of 18 in. of ¼ in. plate; reinforced at the bottom by a heavy 6 in. channel, and at the top by a special 3 by ⅝ in. bar, the side sill being 32¼ ft. long. The centre stringers consist of 4 in. channels, and the end sills of the motor car and front sill of the trailer are formed of 9 in. channels. In order to reduce the weight, and in consequence of the rear end of the trailer being subject to no extraordinary strain, a 7 in. channel forms the sill at that end. In the construction of the motor car underframe, 12 crossings are employed, six of which are formed of 4 in. channels, while the remainder are light angles. The trailer framing crossings consist of six 4 in. crossings. The platforms of the motor car, and the front platform of the trailer, are on outside knees of 6 in. channels, and centre knees of 4 in. channels, but the rear platform of the trailer, being subjected to a constant weight of seated and standing passengers, is supported on outside knees of 8 in. channels, with 5 in. channels for centre supports.

The side framing of the car body is one of the features of the original design followed out in this latest order. In the earlier cars on the Montreal lines it had been found that the central aisle was rather crowded with the overall body width that could be operated on the streets. This hampered central aisle width was widened in the initial car of this design by reducing the thickness of the wall posts by reinforcing the belt rail and vertical posts by a strip of steel along the recessed sides, where the vertical and horizontal members dovetail each other. A considerably thinner wall construction than normal is thus made possible, with the result that this added room may be given to the central aisle. The corner and side posts are of ash, and the plain arch roof is supported on steel rafters at each post, with wooden carlines between. The side panels are of very thin sheet steel, and extend from the side sill to the belt rail. These are made in small sections, the width of the windows, and may be sprung into place, and secured by small screws, so that they may be readily replaced in the event of a minor accident, without the necessity of shopping. All platforms are enclosed in round end vestibules, sheathed outside below the window sills in sheet steel.

The front platforms have three single drop sashes in front, that in the centre of the motor car front vestibule being adjustable. Aside from the vestibule windows, all windows are of the double sash type, the upper sashes being stationary, with the lower ones arranged to drop into pockets. All the side windows are provided with wire mesh screen guards, and have storm sashes which can be applied in the winter by means of the clips used for the screens. When in place the inner windows are not opened.

All the vestibules are enclosed by doors, the arrangement of these latter being of interest, especially as the use of doors on the rear vestibule of Montreal cars is a new departure, whereby both the rear as well as the front bulkheads are removed. Towards the front end of the front vestibule there is a two leaf folding door, operated from the motorman's position, acting as the main exit from the car. This is panelled with wire glass in the lower panel, in conformity with the latest practice, and with plain glass above. The rear platform of the motor car and the front vestibule of the trailer have two sets of two leaf folding doors, which can be operated independently or in unison by the conductor from his stand on the rear vestibule. The end doors of each pair serve as the entrance doors, and the inner ones, in the motor car, as an auxiliary exit, while in the trailer it is the main exit. The rear end of the trailer has a single two leaf folding door for use only in emergency. All these doors have folding steps, which operate in conjunction with the doors. By this arrangement all the loading, and a good portion of the unloading is attended to at the centre of the

train unit, thereby avoiding the delays when the entrances and exits are a considerable distance apart. All doors are wired in series, the closing of the last door giving the motorman the clear signal.

The motor cars are mounted on Brill 27-GE2 trucks, and the trailers on Brill 67-F trailer trucks. The motor car is equipped with four Westinghouse 101 motors. Westinghouse straight air braking is used. These cars were supplied by the J. G. Brill Co., Philadelphia, Pa.

Ottawa Electric Railway Company's Annual Report.

Following are extracts from the company's annual report of the calendar year 1913, presented at the annual meeting, Feb. 2.

Gross earnings	$1,041,282.23
Operating expenses and maintenance	629,122.14
Net earnings	$412,160.09
Net earnings, 1912	400,059.07
Increase, 1913	$12,101.02

The net earnings have been disposed of as follows:—

Four quarterly dividends of 3% and a bonus of 3%	$281,535.00
Interest on bonds and loans	20,772.18
Mileage payments	13,737.26
Taxes	12,221.81
Placed to credit of contingent account to be applied to reduction of track renewals, car equipment, and other accounts	55,000.00
Transferred to credit of profit and loss	28,893.84
	$412,160.09

Percentage of operating expenses to receipts:—1899, 57%; 1900, 57%; 1901, 63%; 1902, 60%; 1903, 61 4-5%; 1904, 62%; 1905, 59 2-5%; 1906, 57 4-5%; 1907, 59 4-5%; 1908, 66 2-5%; 1909, 63½%; 1910, 63%; 1911, 57 2-5%; 1912, 57 1-5%; 1913, 60 2-5%.

23,987,883 passengers were carried, compared with 21,815,798 in 1912. The balance at credit of profit and loss account is now $167,158.67, and of rest account $200,000.

The new work carried out and completed during the year was as follows:—1,000 h.p. Substation on Centre St; 1,000 h.p. Substation on Nelson St. Extension of tracks to Ottawa South from Wilton Crescent, forming a loop on Sunnyside, Seneca and Glen Ave. Preston St. extension from Somerset St. southerly and re-arrangement of tracks on Broad St. Double tracks on Queen St. from Bank to Elgin St. An additional track on Crichton St. from Beechwood Ave. to Charles St. and a loop by way of John St. The 4,200 h.p. steam turbo generator referred to in last report is expected to be ready for operation early in the spring. A large amount has been spent in improving the tracks and rolling stock as well as other properties, and the company is now in a better position than ever to handle any business that may offer.

The records show an increase in gross receipts from $71,000 in 1892 to over $1,000,000 in 1913. Your directors look forward to still greater increases during the remaining years of the franchise.

PROFIT AND LOSS ACCOUNT.

Balance at credit, Dec. 31, 1912	$138,264.83
Net earnings, 1913	412,160.09
	$550,424.92
Dividends and bonus	$281,535.00
Taxes	12,281.81
Mileage payments	13,737.26
Interest on bonds and loans	20,772.18
Contingent account	55,000.00
Balance at credit	167,158.67
	$550,424.92

The directors for the current year, who were re-elected, are as follows:—President, T. Ahearn; Vice President, W. Y. Soper; Secretary-Treasuerr, J. D. Fraser; other directors, T. Workman, R. Quain, T. F Ahearn, E. N. Soper.

Toronto Railway Company's Annual Report.

Following are extracts from the report of the calendar year 1913, presented at the annual meeting, Feb. 4:—

Gross earnings		$6,049,018.92
Charges for operating, maintenance, etc.		3,123,308.55
Net earnings		$2,925,710.37
From which net earnings there was deducted $2,158,472.78, distributed as follows:—		
Dividends	$879,958.00	
Bond interest, etc.	188,806.72	
		$1,068,764.72
Payments to City:—		
Percentage on earnings	$939,990.93	
Pavement charges	91,466.20	
General taxes	58,250.93	
		1,089,708.06
		$2,158,472.78

The gross passenger earnings were $5,980,695.88 compared with $5,367,502.48 for 1912, an increase of $613,193.40. The various charges against these earnings for operating, maintenance, etc., amounted to $3,123,308.55 or 52.2% of passenger earnings.

The payments made to the city amounted to $1,089,708.06, an increase of $147,659.10 over the previous year.

The third drawing of sterling bonds, under the terms of the mortgage deed dated Sept., 1892, took place June 27, 1913. The company draws annually 5% of the amount of bonds issued, same to be redeemed on August 31 following the date of drawing, and from which date no interest is payable on bonds so drawn. There has been drawn to date a total of $562,512.55.

The expenditure on capital account throughout the year amounted to $1,064,857.73. In addition to various extensions and improvements to certain of the shops, car houses, etc., the following buildings were erected: A storage battery building was completed in connection with the Harrison St. sub-station, a sub-station (no. 4) was erected in Queen St. East, opposite Logan Ave., and a paint shop was built on Queen St. East on property running from Queen St. to Eastern Ave. Large expenditure was made in the installation of a storage battery plant in the Harrison St. building, in the construction of additional rolling stock and the purchase of electrical equipment for same, and in the extension of the track and overhead system in different sections of the city. To meet heavy expenditure on capital account your directors disposed of £100,000 of bonds of the sterling issue held in the treasury. The maintenance of the plant, rolling stock equipment and other properties have received careful attention throughout the year.

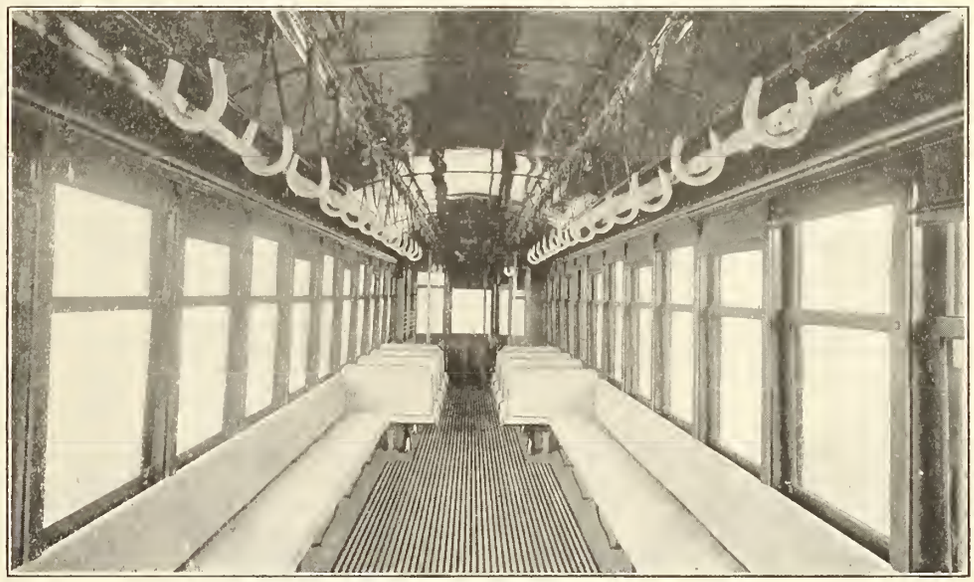
Your directors declared out of the accumulated surplus earnings, four quarterly dividends of 2%.

The Toronto and York Radial Ry. Co. reports very satisfactory increases, the gross earnings amounting to $584,490.93, compared with $492,922.86 for the previous year, an increase of 18.5%.

Gross earnings			$6,049,018.92
Operating, maintenance, etc.	$3,123,308.55		
Interest on bonds, etc.	195,806.72		
Percentage on earnings	939,990.93		
Pavements, taxes	156,100.50		4,415,206.70

PROFIT AND LOSS ACCOUNT.

Balance from 1912		$3,694,747.00
Surplus earnings		$1,633,812.22
expenses, interest, taxes, etc.		1,633,812.22
		$5,328,569.22
Dividends, four of 2% each, on paid up capital		$ 879,958.00
Balance from 1912		$3,694,757.00
Surplus carried forward	753,854.22	4,448,611.22
		$5,328,569.22



Interior of Motor Car, Montreal Tramways Co.

COMPARATIVE STATEMENT.

	1913.	1912.	Increase.
Gross income	$6,049,018.92	$5,448,050.36	$600,968.56
Operating, Maintenance Charges, etc.	3,123,308.55	2,866,550.12	256,758.43
Net earnings	2,925,710.37	2,581,500.24	344,210.13
Passengers carried	151,236,925	135,786,573	15,450,352
Transfers	63,083,118	56,176,985	6,906,133
Percentage of charges, etc. to passenger earnings	52.2	53.4	*1.2

*Decrease.

The percentage of charges and to passenger earnings for 11 years has been as follows:—1903, 55.3%; 1904, 58.2%; 1905, 56.8%; 1906, 52.9%; 1907, 53.9%; 1908, 52.9%; 1909, 51.4%; 1910, 51.4%; 1910, 51.6%; 1911, 55.2%; 1912, 53.4%; 1913. 52.2%.

The directors for the current year, who were re-elected, are:—President, Sir W. Mackenzie; Vice-President, F. Nicholls; other directors, Sir Henry M. Pellatt, Sir Rodolphe Forget, W. D. Matthews and Jas. Gunn. The vacancy caused by Hon. G. A. Cox's death has not been filled.

The Guelph Radial Ry. has ordered two double truck, double end city cars from Preston Car and Coach Co.

Electric Railway Statistics for Year Ended June 30, 1913

The following abbreviations are used in the names of railways:—E, electric; E.R., electric railway; E.S.R., electric street railway; S.R., street railway. The minus mark (—) in the column for net income or deficit, shows that there was a deficit in the operation of the line to the extent of the figures given. The numbers following the names of the railways, refer to the notes following the table on this page.

	First Main Track Mileage	Gross earnings from Operation	Miscellaneous Earnings	Operating Expenses	Taxes, Funded Debt, etc.	Net Income or Deficit	Total Car Mileage	Fare Passengers Carried
Berlin and Waterloo S.R.	3.20	$ 48,547		$ 34,038	$ 12,482	$ 12,026	129,463	958,750
Berlin and Northern Ry.	2.45	8,942		6,692	1,428	821	33,500	206,052
Brantford and Hamilton Ry.	23.00	146,595		102,969	69,892	—26,266	333,047	526,496
British Columbia E.R.	177.44	4,179,881		3,239,441		940,439	12,227,791	71,937,822
Calgary Municipal Ry.	50.00	704,053		502,119	83,904	118,029	2,648,234	16,986,538
Canadian Resources Development Co.	1.75	1,636		3,373		—1,737	29,200	26,721
Cape Breton E.R.	30.52	220,264	$ 121,529	125,816	103,262	112,714	655,208	4,186,809
Chatham, Wallaceburg and Lake Erie Ry.	38.94	138,950		79,398	39,165	20,386	333,244	416,761
Cornwall E.R.	4.00	36,497		28,374		8,123	219,870	450,571
Edmonton Radial Ry.	30.23	581,162		502,316	140,623	—61,777	1,704,791	13,836,406
Galt, Preston and Hespeler E.R.	17.81	212,659	269	125,772	21,407	65,749	348,189	1,262,825
Grand Valley Ry.	40.36	107,546	154,652	79,996	16,363	11,185	491,388	1,575,692
Guelph Radial Ry.	8.50	38,401		28,839	1,622	7,939	329,000	929,945
Halifax Electric Tramways Co.	11.24	272,445		164,508	43,095	219,493	1,011,723	6,147,000
Hamilton and Dundas E.R.	7.00	66,144		42,854	6,055	17,234	144,150	768,979
Hamilton, Grimsby and Beamsville E.R.	22.00	139,697		119,429	12,141	8,126	384,653	736,511
Hamilton Radial Ry.	25.00	195,735		146,147	50,608	—1,020	580,042	2,373,436
Hamilton S.R.	22.00	603,615		349,159	87,009	167,445	1,901,940	15,595,131
Hull E.R.	14.12	148,386	34,719	115,669	40,936	26,500	818,589	2,300,456
International Transit Co.	4.30	86,760	19,479	45,565	19,860	40,814	295,160	2,053,780
Kingston, Portsmouth and Cataraqui E.R.	8.00	38,578		32,800	5,415	363	199,680	910,456
Levis County Ry.	10.50	78,182	206	63,979	13,280	1,129	390,593	1,622,880
Lethbridge Municipal Ry.	11.00	50,934		51,228	14,782	—15,076	371,149	1,184,392
London S.R.	25.73	322,182	64	217,510	34,261	70,474	1,495,681	8,701,268
London and Lake Erie Ry. and Transportation Co.	29.02	124,490	1	81,591	41,839	1,060	382,869	607,314
Moncton Tramway	2.72	16,912		17,986		—1,073	83,255	406,541
Montreal Park and Island Ry.	29.37						1,348,967	4,909,336
Montreal S.R. (1)	76.67	6,754,227		4,032,664	2,083,231	638,331	16,117,398	159,892,021
Montreal Terminal Ry.	18.22						678,643	1,917,795
Montreal and Southern Counties Ry.	11.40	131,079	130	114,082	1,595	15,531	336,225	1,661,245
Moose Jaw E.R.	7.50	103,654		89,411		14,242	413,359	2,174,745
Niagara, Welland and Lake Erie Ry.	1.74	17,486		10,237	3,164	4,084		377,177
Nelson S.R. (2)	1.25	12,574		13,080	1,897	—2,404	53,664	308,823
Niagara Falls Park and River Ry.	11.91	147,577	6,950	80,238	34,154	40,114	297,983	1,365,661
Niagara, St. Catharines and Toronto Ry.	47.76	475,360		326,905	88,312	60,142	989,470	3,877,008
Nipissing Central Ry.	5.70	73,116	839	43,760		30,195	190,868	901,891
Oshawa Ry.	9.00	108,089	369	85,545	4,368	18,545	83,920	253,203
Ottawa E.R.	23.56	979,962		580,982	40,281	358,698	4,446,414	22,345,111
Peterborough Radial Ry.	6.04	46,709		32,559	8,582	5,566	263,050	1,003,331
Pictou County Ry.	7.90	56,253	34,415	31,480	40,545	18,643	135,662	1,171,470
Port Arthur and Fort William E.R.	25.33	255,196	3,236	162,128	12,351	83,953	1,163,036	5,937,674
Quebec Ry. Light and Power Co.—								
Citadel Division	17.72	425,657		284,058	256	141,343	1,967,554	9,809,674
Montmorency Division	28.60	211,906		152,539		59,366	406,792	1,588,694
Regina Municipal Ry.	13.09	141,912		122,331	52,877	—33,297	591,452	3,219,369
Sandwich, Windsor and Amherstburg Ry.	38.28	250,848	66,811	152,861	35,714	129,083	1,011,072	4,337,304
Sarnia S.R.	8.25	47,995		34,342	4,549	9,108	143,900	727,398
Sherbrooke S R.	9.00	48,159	78,486	37,192	88,579	874	448,144	1,115,038
St. John Ry. (3)	12.50	191,412	96,030	148,266	51,613	87,561	1,003,454	4,330,339
St. Stephen S.R.	4.00	36,011		27,580	5,673	2,758	183,960	682,380
St. Thomas S.R.	7.00	21,129		29,038		—7,909	295,785	470,609
Surburban Rapid Transit Co.	19.61	42,020	21,162	62,424	26,981	—26,223	304,900	1,115,418
Toronto Ry.	61.72	5,772,854		3,014,774	1,204,388	1,553,690	20,280,225	144,771,901
Toronto Surburban Ry.	9.84	103,613	11,466	52,402	19,451	33,226	312,934	1,967,934
Toronto and York Radial Ry.	72.43	531,478		317,774	142,177	71,526	1,358,089	525,571
Windsor, Essex and Lake Shore Rapid Ry.	36.16	147,896		82,991	57,067	7,837	349, 855	470,227
Winnipeg E.R.	89.12	2,376,925	678,087	1,257,916	441,184	1,355,911	7,337,728	57,083,091
Winnipeg, Selkirk and Lake Winnipeg Ry.	22.13	114,912		58,992	23,734	32,185	199,573	476,532
Yarmouth E.R.	3.00	20,908		19,223	2,730	—1,045	63,978	151,694
	1,356.63	$28,216,110	$1,318,909	$17,765,372	$5,334,905	$6,612,574 —177,832	90,819,638	597,863,801
						$6,434,742		

Notes to Electric Railway Statistics.

(1) The figures relating to the Montreal Tramways Co. include the Montreal St. Ry., the Montreal Park and Island Ry., and the Montreal Terminal Ry. They are taken from the Montreal Tramways Co.'s last annual report, as that company does not make returns to the Railways Department.

(2 and 3) The Nelson St. Ry. and the St. John Ry. did not make returns and the figures given are those of the previous year.

Berlin and Northern Railway Report.

The statement for 1913, recently submitted to the Berlin, Ont., Light Commissioners, operating the Berlin and Northern Ry. on behalf of the city, shows gross profits after paying debenture interest, etc., of $9,977.01. From this is deducted $5,816.77 for depreciation, being 10% on machinery, 5% on rolling stock, and 3% on track. After deducting depreciation there is a net profit of $4,160.24. During the year, 1,192,886 passengers were carried, an increase of 21.4%; and the car mileage was 261,328, an increase of about 80%; the operating expenses per car mile were 14.5c., against 22.4c for the previous year.

The receipts of the street railway department were $55,236.79, and the total expenses $45,259.78. The amounts received from cash fares and tickets were $22,661.01 and $25,338.70 respectively V. S. McIntyre is Secretary Treasurer of the Commission.

Electric Railway Projects, Construction, Betterments, Etc.

Alberta Metropolitan Ry.—We are officially advised that this railway, when completed, will be operated by the company, and not, as has been reported, by the Calgary Municipal Ry. No order has been placed for cars, but it is said that individual gasoline electric cars will be used. The Manager is W. J. C. Madden, Calgary, Alta. (Feb., pg. 69.)

Berlin, Waterloo, Wellesley and Lake Huron Ry.—Application is being made to the Dominion Parliament to change the name of the company to the Grand River Ry. H. C. Oswald, Assistant Secretary, C.P.R., Montreal, is Secretary. (See C.P.R. Betterments, etc., July, 1909, pg. 491.)

Cape Breton Electric Co.—Press reports state that plans are in preparation for the extension of the company's line from Sydney to New Waterford, N.S. (Dec., 1913, pg. 592.)

Cedar Rapids Manufacturing and Power Co.—The Minister of Railways has approved of location plans for a transmission line from Cedar Rapids to the transformer station near Cornwall, Ont., 44 miles.

Dominion Power and Transmission Co.—At the annual meeting in Hamilton, Ont., Feb. 16, it was announced that the projected extension from the company's Hamilton and Brantford Ry. from Langford to Galt, Ont., will be built in the near future. (Dec., 1913., pg. 592.)

Edmonton Interurban Ry.—We have been furnished with the following official information:—The first portion of the line from St. Albert to Edmonton, Alta., was put in operation Sept. 30, 1913, there being a gap of about 2 miles in a direct line between the company's southern terminus and the Edmonton Radial Ry's. line, which is owned by the city of Edmonton. Pursuant to an agreement between the city and the E. I. R. Co., the city extended its line one mile north and the E. I. R. Co. extended its line 1½ miles south, and on Dec. 20, 1913, the E. I. R. Co's. car commenced connecting with the city cars, both lines issuing and honoring transfers. The E. I. R. Co's. line from the connecting point at 24th St. and Alberta Ave., to the village of Calder is 1½ miles long, from Calder to the city limits on the north 1 mile, and from the city limits to St. Albert 9½ miles. Five trips a day each way are made between Edmonton and St. Albert by a self propelled gasoline electric car, built in the United States. The company possesses, among other properties, an entire block, situated near the northerly boundary of Edmonton, where are erected a car barn, machine shop, stores, warehouse and an oil warehouse, also a boarding house, pump house, etc., and rails, ties and material are stored there. The directors are: President, G. Barbey, Paris, France; Vice President, J. H. Picard, Edmonton; General Manager, Felix Santallier, Edmonton; other directors, J. H. Gariepy, M. Kimpe, L. Bureau, Edmonton. The greater portion of the stock is owned by the Franco-Canadian Trust Co., of Vancouver, B. C., and Paris, France. (Jan., pg. 38.)

Edmonton Radial Ry.—The Edmonton, Alta., City Council has ordered the preparation of a report specifically dealing with an extension of the street railway system, so as to serve the Riverdale district, north of the Saskatchewan River; and for a continuation of such extension so as to serve Forest Heights, Mount Pleasant, East Edmonton Gardens and other districts, finally connecting up with the line at present terminating between Bonnie Doon and Highland Park addition It is expected that construction will be started on the Riverdale extension, at any rate, during this year. Feb., pg. 87.)

Forest Hill Electric Ry.—Press reports state that construction will be started early in the summer on the first section from the northerly limit of Toronto, along Forest Hill Road to Eglinton Ave., and along that avenue westerly. (Feb., pg. 87.)

Fort William Electric Ry.—The Fort William, Ont., City Council decided, Feb. 10, to take into consideration the application of the Mount McKay and Kakabeka Falls Ry. for running rights over certain portions of the city electric railway. (Feb., pg. 87.)

Galt, Preston and Hespeler St. Ry.—A press report states that new transformer and a new rotary converter are being installed in the power house at Galt, doubling its present capacity. The by-law passed by the town of Preston confirms an agreement granting the company a franchise for 25 years, from Mar. 27, 1913, for a double track electric railway, on certain streets, in the town, and a single track line, on certain other streets, with the right to cross Duke and Lawrence streets with industrial switches. The agreement permits the company to carry freight over certain portions of the line at a speed not exceeding five miles an hour. The company agrees that its cars shall make connection with all trains on the C.P.R. at Galt, and that it shall maintain a passenger station, freight shed and power house in Preston. (Feb., pg. 87.)

Guelph Radial Ry.—Press reports state that it is expected that construction on the extension of one or more of the existing lines will be put in hand during this year. (Feb., pg. 87.)

Kingston, Portsmouth and Cataraqui Electric Ry.—Press reports state that a contract has been let to a U.S. firm for the supply of steel rails to be used in relaying the lines on King and Princess Streets, Kingston, Ont. (Dec., 1913, pg. 593.)

Lacombe and Blindman Valley Electric Ry.—A special meeting of shareholders was called to be held at Lacombe, Alta., Feb. 21, for the purpose of entering into a new contract with the Middle West Construction Co. for the building of the projected line, in substitution for the contracts entered into Nov. 17 and 24, 1913; to authorize the issue of bonds for $30,000 a mile; of which $7,000 a mile is to be secured by a first mortgage; and an additional $7,000 a mile by a second mortgage, and the balance under first or second mortgage as may be expedient; to enter into an agreement with the Alberta Government under the Light Railways Assistance Act, and for other purposes.

Press reports state that eight miles of grading have been completed and that contracts for ties and rails have been let. The section of line under construction extends from Lacombe to Gull Lake, 10 miles, but the contract provides for a further 20 miles from Gull Lake to Rimbey. J. B. McBride, Lacombe, Alta., is Secretary. (Jan., pg. 38.)

Lethbridge Municipal Ry.—Commissioner Reid submitted plans to his colleagues on the Lethbridge, Alta., Municipal Commission recently, for the building of four miles of additional single track on the city electric lines during this year, at an estimated cost of $60,000. The work will probably be done provided the city can find the money. (June., 1913, pg. 286.)

London and Lake Erie Ry. and Transportation Co.—A conference took place at Aylmer, Ont., recently, between G. B. Woods, Vice President of the company, and representatives of the municipalities, as to the proposed construction of a line from St. Thomas to Aylmer and Port Burwell. Mr. Woods is reported to have stated that the company is prepared to go on with the work at once, if the municipalities will get together and decide as to the amount of bonds each will guarantee. The company is asking for a bond guarantee of $20,000 a mile, but the municipalities before coming to a decision desire to know what are the prospects for the building of a line under the Hydro-Electric Commission. (Feb., pg, 87.)

Moncton Tramways, Electricity and Gas Co.—Press reports state that arrangements are being made for the building, during this year, of about six miles of additional track between Moncton, Sunnybrae and Louisville, N.B., (Dec., 1913, pg. 593.)

The Montreal East Boulevard Co. is asking an extension of its powers from the Quebec Legislature. Among the powers obtained in 1910, when the company was incorporated, was the right to build an electric railway along a boulevard which it was to construct in Montreal East. (May, 1910, pg. 399.)

Morrisburg and Ottawa Ry.—At a conference between representatives of the company and of the Town council of Morrisburg, the question of a right of way in the town was discussed. The company was informed that the council could not promise anything until after Oct. 1, on which date the franchise for the building of a line in the town granted to the St. Lawrence and Ottawa Electric Ry. will expire unless active construction work is started meanwhile. (Feb., pg. 88.)

Niagara, Welland and Lake Erie Ry.—Press reports state that the company has completed its financial arrangements and will proceed with the construction of its projected line from Welland to Port Colborne and Fort Erie, Ont., this year. The company has power to build lines to various points throughout the Niagara peninsula. Following are the directors for this year:—President, H. C. Schofield, M.P., Guelph, Ont.; Vice President and Managing Director, C. J. Laughlin, Welland, Ont.; Secretary and Treasurer, H. Rook, Toronto. Other directors:—H. B. Bulles, W. W. Near, Toronto. (Feb., pg. 88.)

Ontario Hydro Electric Power Commission Lines.—Conferences have been held at Berlin, Hamilton, London, Sarnia, Owen Sound and Penetanguishene, Ont., in connection with projects for the building of electric railways under the plans suggested by the O. H. E. P. Commission. At each place resolutions favorable to the general plans and a desire for the building of a line to connect up their particular town with the line, were passed. The Commission has a number of engineers in the field looking over suggested routes. (Feb., pg., 86.)

Ottawa, Rideau Lakes and Kingston Ry.—The Ontario Legislature is being asked for an extension of time for the building of this projected railway from Ottawa to Kingston, Ont. G. L. Dickinson, Ottawa, is Secretary. (Oct., 1912, pg. 521.)

Quebec Extension Rd.—In connection with the proposed extensions of the line now under construction along the St. John River Valley in New Brunswick, we are officially advised that the interests building the line also own the Aroostook Valley Rd., an electric line extending from the C.P.R. at Presque Isle to Washburn, Me. The Quebec Extension Rd., for which the same interests have secured a charter in the State of Maine, will extend westward from Washburn to tp. 12, range 17, at the International Boundary between Maine and Quebec, where connection will first be made with an extension of the Quebec Central Ry.,

projected and under construction northward from St. Sabine, Que. It is ultimately intended to continue the line through Quebec to the Quebec Bridge, where connection will be made with the different transcontinental railways converging there from the west.

At the eastern end of the Q. E. Rd., Washburn, Me., connection will be made over the Aroostook Valley Rd. with the C.P.R. at Presque Isle, Me., and thence over that company's tracks, via Aroostook Jct., to St. John, and to other points in New Brunswick by way of Plaster Rock and the National Transcontinental Ry. Connection will also be made at Portage Lake and Washburn by the Bangor and Aroostook Rd. for points in the State of Maine. It is not likely, owing to the change in the proposed route of the St. J. and Q. Ry. between Centreville and Andover, that direct connection will be made with that line. The proposed line will have a length of 110 miles in the State of Maine, and of 64 miles in Quebec. It will be operated throughout by electricity. The object of the railway is to provide the shortest possible line between Quebec Bridge and the Maritime Provinces.

The surveys have been completed and the location in the U.S. has been approved by the Maine Railroad Commissioners. The gradient will not exceed 1% compensated for curvature, and the maximum curvature will be 10 degrees. The principal bridges will be those across the St. John River, 600 ft.; Alligash River, 600 ft.; and Beaver Brook, 80 ft. It is probable that construction will be started this year. S. B. Wass, Presque Isle, Me., is Chief Engineer, and the Canadian Eastern Construction Co. will have charge of construction. (See St. John and Quebec Ry., Feb., pg. 70.)

Rainy River Radial Ry.—Application is being made to the Dominion Parliament for an extension of time for the building of the lines authorized by chap. 152 of the statutes of 1910. Lewis and Smellie, Ottawa, solicitors for applicants. (Mar., 1910, pg. 233.)

Sarnia, Ont.—A press report states that a number of local men are interested in a scheme to build an electric railway from Sarnia to Wallaceburg, and to operate steamboats, etc. It is said that the proposal is backed by New York capital, and that probably an existing charter covering the territory named, will be acquired.

Saskatoon Municipal Ry.—The Saskatoon, Sask., City Council had under consideration, Feb. 9, the question of laying track under the 19th St. subway, to connect the tracks on 20th St. West with those on 2nd Ave. The estimated cost by the Stone and Webster Co., who laid out the lines for the city, was $64,350. The City Engineer has submitted a revised estimate for the work at $79,143. No decision has been reached as to whether the work will be undertaken or not during this year.

The general estimates for this year provide for the expenditure of $25,000 on some small extensions, improvements of overhead work, and a new rotary converter for the power house. (Feb., pg. 88.)

Sudbury-Copper Cliff Suburban Electric Ry.—The Ontario Legislature is being asked to extend the time for the building of this projected electric railway, and to confirm a bylaw passed by the Sudbury Town Council, Aug. 25, 1913, granting the company a franchise for its proposed line. A. D. Meldrum, Sudbury, Ont., is solicitor for the company. (Dec., 1913, pg. 593.)

Toronto, Barrie and Orillia Ry.—The Barrie, Ont., Town Council has finally approved of the bylaw approving the agreement giving a franchise to the company for a line in the town.

The Ontario Legislature is being asked to authorize the company to increase its bond issue; to give the right to operate cars on Sundays, and to extend the time for construction. (Feb., pg. 88.)

Valleyfield Waterpower Company, which has been incorporated under the Quebec Companies Act, is applying to the Dominion Parliament for authority to build the following railways, to be operated by electricity:—From Salabery to Valleyfield southwesterly across the counties of Beauharnois and Huntingdon, along Lake St. Frances to the provincial boundary; from the same starting point southwesterly across the counties of Beauharnois, Chateauguay and Huntingdon to the International Boundary, and from the same starting point northeasterly, crossing the St. Lawrence River and across the counties of Soulanges and Vaudreuil to the Lake of Two Mountains. The company may not build its railway along any street or highway without having first obtained the consent of the municipality interested, and in connection with its undertaking may operate steam or other vessels carrying passengers and freight. It may issue bonds for $30,000 a mile, and other securities in connection with its other objects.

Winnipeg Electric Ry.—Application is being made to the Manitoba Legislature for authority to build a power line through Fort Garry municipality. The municipality asks that it have the joint use of the poles, to offset the use of the streets by the company.

The City Engineer is investigating the cost of a proposed extension of the car line to Brookside Cemetery. (Feb., pg. 88.)

Sale of Grand Valley Railway and Brantford Street Railway.

At a meeting of bondholders of the G. V. R., held in Toronto, Feb. 13, offers for the purchase of the company's property were considered. E. B. Stockdale, the Receiver, presided, and J. A. Worrell, K. C., reported that the Special Committee had received two offers for the property. One was from W. P. Kellett, General Manager of the Lake Erie and Northern Ry., at a total price of $82,600, and one from the city of Brantford at a total price of $96,000. The committee recommended the acceptance of the latter offer, and the bondholders decided to accept it and agreed to apply to the courts to ratify the sale, which includes the Brantford St. Ry., and the Grand Valley Ry. from Brantford to Galt, via Paris. The purchaser undertakes to redeem the bonds on the B. S. Ry., held by the Canadian General Electric Co., amounting to $125,000. When the G. V. Ry. took over the B. S. Ry. it issued $59,000 of 1st mortgage bonds, and $1,700,000 of 2nd mortgage bonds. These will now rank for dividend.

The matter came before the court at Toronto, Feb. 19, when it was ordered that the terms of the agreement, with the consent of the parties concerned, be submitted at an early date, when, probably the court's consent will be given to the transfer.

The contract will have to be ratified by the ratepayers of Brantford. It is expected that the city council will at once put the city lines in good shape, and will operate them, as well as the section of the G. V. Ry. as far as Paris, abandoning the line from Paris to Galt, which has been a source of loss ever since it was built.

The adjourned cases brought by the city against the company came before the Court of Appeal, Feb. 16, but under the circumstances were adjourned. If the sale is ratified by Brantford ratepayers and the courts, all the actions will be abandoned with the exception of one by the second mortgage bondholders against the directors of the G. V. Ry.

Sandwich, Windsor and Amherstburg Railway.

The Detroit United Railway's report for the year 1913 contains the following particulars in regard to the Sandwich, Windsor and Amherstburg Ry., which is one of its subsidiaries:—

On Jan. 1, 1913, the mileage was 38.284, and there was added in 1913 1.647 miles.

Passenger statistics:—Revenue passengers, 4,758,504; transfer passengers, 691,490; employe passengers, 13,841; total, 5,463,835. Receipts revenue passenger, .0523; receipts per passenger, .0456.

Mileage statistics:—Car mileage, 1,015,747; earnings, car mile, .2542; expenses, car mile, .1535; net earnings, car mile, .1007.

During the year, $150,782.10 was spent on extension of lighting plant, building of new track and addition to power plant.

BALANCE SHEET, S.W. & A. RY.

Capital stock		$ 297,000.00
Mortgage bonds		600,000.00
Accrued interest on bonds		4,987.50
Detroit United Railway		464,359.94
Vouchers payable		2,712.13
Injuries and damages reserve		2,406.52
Insurance reserve		923.30
Unredeemed tickets		7,627.20
Profit and loss		18,096.56
Investment	$1,255,604.01	
Treasury bonds	110,000.00	
W. & T. Elec. Railway Co. (Stock)	10,000.00	
W. & T. Elec. Railway Co.	18,821.29	
Accounts receivable	813.52	
Stores	1,067.22	
Cash	1,807.11	
	$1,398,113.15	$1,398,113.15

BALANCE SHEET, WINDSOR & TECUMSEH ELECTRIC RY. CO.

Capital stock		$100,000.00
Mortgage bonds		189,000.00
Sandwich, Windsor & Amherstburg Ry.		18,821.29
Investment	$307,821.29	
	$307,821.29	$307,821.29

The earnings and expenses of the Windsor & Tecumseh Electric Ry. are included in the operations of the Sandwich, Windsor & Amherstburg Ry., which latter company owns all of the capital stock of the W. & T.E.R. Co.

Personal Paragraphs.

H. DOUGHTY, Superintendent Regina Municipal Ry., Regina, Sask., is reported to have resigned, the resignation, as accepted by the city council to take effect May 1.

F. R. GLOVER, General Executive Assistant, British Columbia Electric Ry., gave an address on the history of the company to a large audience in the draughting room of the company's offices, Vancouver, Feb. 11

E. F. SEIXAS, General Manager, Niagara, St. Catharines and Toronto Ry., St. Catharines, Ont., was married at Atlanta, Georgia, Feb. 21, to Miss Dorothy G. Almon, daughter of Rev. H. L. Almon, rector of Merritton, Ont.

J. H. TRIMMINGHAM, who was Assistant to the Chief Engineer of the Electrical Commission of the City of Montreal, was recently appointed Superintendent of Power, Sherbrooke Railway and Power Co., Sherbrooke, Que., succeeding J. B. Woodyatt, who is now engaged with the Southern Canada Power Co., which has been organized by C. J. McCuaig, President of the Sher-

Fare Box Difficulties in Fort William. The Fort William, Ont., Herald, in a report of a recent meeting of the City Council's street railway committee said:—"A report to the effect that the fare boxes on the new pay-as-you-enter cars are unsatisfactory, as the tickets do not get into the lower part of the box and this prevents correct accounting between the two cities, was taken up, and it was stated that a man from the factory was now on the ground fixing them."

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and Allied Companies.—Gross earnings for December, $793,219; operating expenses, maintenance, etc., $548,535; net income $244,684, against $773,741 gross earnings; $538,901 operating expenses, maintenance, etc.; $234,840 net income for Dec. 1912. Aggregate gross earnings for six months ended Dec. 31, $4,653,726; net earnings $1,221,405, against $4,250,824 aggregate gross earnings; $1,251,853 net earnings for same period 1912.

Brandon Municipal Ry.—The Mayor of Brandon, Man., is reported to have stated in a speech Feb. 9, that the city's electric railway system was losing at the rate of about $100 a day. The council, after a most careful consideration of the whole situation, decided with but one dissenting voice to reduce the operating staff by one half. J. J. Antonisen, Superintendent, has resigned.

Cape Breton Electric Co.—Gross earnings for Dec., $36,169.26; operating expenses and taxes, $17,632.45; net earnings, $18,536.81; interest charges, $5,176.78; balance, $13,360.03; bond sinking and improvement funds, $1,190; balance for reserves, etc., $12,170.03, against $34,387.35 gross earnings; $16,123.65 operating expenses and taxes; $18,263.70 net earnings; $4,475 interest charges; $13,788.70 balance; $1,206.66 bond sinking and improvement funds; $12,582.04 balance for reserves, etc., for Dec., 1912. Aggregate gross earnings for 1913, $380,951.86; net earnings, $170,998.54; interest charges and bond, sinking and improvement funds, $72,912.89; net balance for reserves, dividends, etc., $98,085.65, against $360,176.84 aggregate gross earnings; $165,296.10 net earnings, $68,105 interest charges and bond sinking and improvement funds; $97,191.10 net balance for reserves, dividends, etc., for 1912.

Dominion Power and Transmission Co.—The report for 1913 shows gross earnings of $2,737,806, an increase of $174,435 over the previous year. After the deduction of operating expenses, the net earnings showed an increase of $77,901 over 1913.

Fort William Electric Ry.—Net receipts for January, $11,004.25.

Hamilton St. Ry.—The city's financial statement for 1913 shows that the percentage received from the street railway during the year was $59,290.56.

Port Arthur Electric Ry.—Net earnings for December $7,418.97, and for January, $10,129.06. The City Treasurer reported to the Council, Jan. 27, that the total amount of debentures issued on account of the electric railway at Dec. 31, 1913, was $909,184.

Quebec Ry., Light, Heat & Power Co.—A press report states that the company commenced on Feb. 17 paying the delayed bond interest due Dec. 1, and the time limit for which expired Feb. 28.

St. John Ry., (N. B.) A press report says that F. A. Sayre has sold his shares to F. R. Taylor, and that H. H. McLean, M. P., Vice President of the company, and Mr. Taylor now control a majority of the stock.

St. Thomas Electric Ry.—January statistics:—Passengers, 42,756; cash fares, $779.24; ticket sales, $1,054, against 42,600 passengers; $446.19 for cash fares and $1,000 for tickets, during Jan. 1913.

Toronto Ry.—Receipts for January, $501,843.70; percentage due the city, $75,276.56, against $472,461.20 receipts, and $68,432,03 percentage due to city, for Jan. 1913.

Winnipeg Electric Ry.—Gross earnings for December, $379,863; operating expenses $211,969; net earnings $167,894, against $361,700 gross earnings; $196,220 operating expenses; $165,480 net earnings, for Dec. 1912. Aggregate gross earnings for 12 months ended Dec. 31, $4,078,694; net earnings $1,826,087, against $3,765,384 aggregate gross earnings; $1,761,236 net earnings for same period 1912.

The Ottawa Traction Company, Limited.

A company with this title was incorporated in October, 1913, with the following directorate:—T. Ahearn, President; W. J. Soper, Vice President; J. D. Fraser, Secretary-Treasurer; T. Workman, R. Quain, T. F. Ahearn, E. N. Soper, Travers Lewis and J. H. Smellie. All of these, with the exception of T. Lewis and J. F. Smellie, are directors of the Ottawa Electric Ry., and Messrs. Lewis and Smellie are that company's solicitors. This is a holding company, which will take over the Ottawa Electric Ry. Co's. stock, giving three shares of Ottawa Traction Co's. stock for one share of Ottawa Electric Ry. Co's. stock. The stock of the latter company has changed hands recently at from 265 to 270 a share. It pays a dividend of 12%, which together with a bonus of 3%, has made it practically a 15% stock for the past two years. It is proposed that a dividend of at least 5% per annum will be paid on the Ottawa Traction Co's. shares, and possibly 6%. This rate of dividend naturally will determine the market price of the stock, which from present expectations will be quoted on the exchanges at 90. It will therefore be apparent that the holders of Ottawa Electric Ry. stock will benefit by the exchange into Ottawa Traction Co. stock (although it will not be compulsory to make the exchange)—inasmuch as they will receive a fixed dividend of 5% equivalent to 15% on their former holdings. If, however, the dividend is 6% then their return will be equal to 18% on stock of the Ottawa Electric Ry.

The Street Railway Situation in Toronto.

The negotiations relative to the proposed acquirement of the Toronto Ry. interests in the city, are still dragging their slow length along. The draft agreement which had been prepared by the City Counsel, was presented to the Board of Control early in February, when exception was taken to a clause dealing with the operation of the Toronto and York Radial Ry. cars over portions of that company's lines within the city boundaries, which it is proposed to take over. The City Counsel was instructed to eliminate the clause allowing such running rights, but declined to do so, on the ground that the general instructions given him for the preparation of the draft agreement, by the City Council, stipulated the condition that the radial cars should have the privilege of running over such of the T. & Y. R. R. lines as were acquired by the city, and within the city boundaries as at present fixed, or as extended in the future; and any change in the instructions would have to be passed upon by the City Council. After an explanation by the Mayor, who has conducted all the negotiations on the city's behalf, that it was not his intention that such running rights should be granted, the City Council, Feb. 9, decided that the city's negotiators be instructed to incorporate any conditions in the draft agreement which they believe would be in the city's interests, and that counsel in the case consult and agree with the Mayor and Board of Control in relation to the same, full details concerning the matter to be reported to the Council for final ratification.

In connection with a recent application of the City Council to the Ontario Railway and Municipal Board, respecting new routes and the rerouting of cars with a view to relieving congestion of traffic, the Board has appointed C. R. Barnes, of the Public Service Commission, New York, to report upon the system and submit a plan on which the Board may consider the issuing of an order.

London Street Railway Company's Annual Report.

Following are extracts from the report for the calendar year, 1913, presented at the annual meeting in London, Ont., Feb. 4:

	1912.	1913.
EARNINGS:—		
Passengers	$301,196.62	$327,075.64
Miscellaneous	5,034.40	4,890.92
Gross earnings	$306,231.02	$331,966.56
EXPENSES:		
Maintenance way and structures	$23,743.37	$26,539.70
Maintenance equipment	28,516.55	30,306.91
Power plant	40,015.09	45,992.83
Car service	86,367.60	99,817.00
General	31,635.58	32,260.15
Total operating expenses	$210,278.19	$234,916.59
NET EARNINGS	95,952.83	97,049.97
Interest on bonds	$28,911.00	$28,848.00
Interest on overdraft	—	265.79
Total deductions	$28,911.00	$29,113.79
NET INCOME	$67,041.83	$67,936.18

During the year $91,439.88 was expended in improvements, extensions, betterments. The extensions agreed upon with the city the previous year were completed within the required time, July 1, by building the Adelaide St. line from Oxford to Central Ave. Commencing with July some of the routes were changed in order to properly operate over the new lines. As was to be expected such changes were objectionable to the citizens of some localities with the result that the City Council required further changes Dec. 1 last. Even these are not wholly satisfactory so that the subject of routes and schedules is still unsettled but will undoubtedly be worked out early in the year. The usual necessary amount of track maintenance was carried on during the open season.

Six new cars of the p.a.y.e. type, with enclosed vestibules, folding doors and steps were received late in the year. These cars have all the latest equipment, and have given great satisfaction. A 500 k. w. Corliss compound engine set which was installed early in the season gave good service for the increased summer's business. Other power house improvements in the way of increased boiler capacity were becoming absolutely necessary so that arrangements were being made to this end when further negotiations were opened by the Hydro-Electric Power Commission for supplying the company with power. As this proposition provided for their furnishing direct current at reasonable rates, the commission installing at their own plant and at their own expense the necessary converting machinery, it was deemed to the best interests of all to obtain power from this source rather than add to the present power plant and a contract was therefore entered into with the Commission for the company's power requirements until the end of the franchise, with a provision for an extension of the power contract if the company's franchise is extended as provided for in the franchise. With additional transmission lines and other improvements being made by the Commission, it is hoped that continuous service will be given by them; however, for the immediate future the present power house will be kept in condition for emergency purposes and to carry the peak load on heavy days.

As anticipated in last year's report, the Ontario Government in accordance with the statute regarding Sunday car service, de-

clared the city to have a population in excess of 50,000 and a vote of the citizens was taken at the municipal election, Jan. 1, resulting in approximately a three-quarter majority in favor of the Sunday car service. It is expected the city council will take the remaining necessary steps early in the season so that the Sunday service may commence at an early date. Previous to the vote on Sunday cars it was agreed with the city council that only a limited service on Sundays should be required, the rates of fare to be the same as on week days, excepting that the limited or workingmen's tickets are not to be accepted.

An issue of $50,000.00 bonds was authorized during the year to provide for improvements but owing to the unsatisfactory bond market, temporary loans were made instead of disposing of the bonds.

The gross earnings and surplus during the year have been very good and as prospects of general business conditions in this city seem good, it is anticipated that the coming year will continue to show good increase. Your directors are pleased to state that our relations with the public continue to be satisfactory and no ligitation of any consequence appears against the company.

PROFIT AND LOSS ACCOUNT.

Surplus, Jan. 1, 1913	$92,418.14
Net income for year	67,936.18
Adjustment and unclaimed wages	921.51
	$161,275.83
Dividends	$33,360.00
Directors' fees	1,000.00
Interest on loan	1,697.82
Deductions from accounts receivable	14.27
Surplus	125,203.74
	$161,275.83

MISCELLANEOUS STATISTICS.—Passengers carried, 9,078,489; car earnings per revenue passenger, 3.64c.; transfers, 1,462,562; total passengers, 10,541,051; car earnings per passenger 3.12c.; car mileage, 1,583,840; gross earnings per car mile 20.96c.; operating expenses per car mile, 14.83c.; net earnings per car mile, 6.13c.; miles of track, 34.97; gross earnings per mile of track, 9,492.89.

The directors for the current year are:—President, H. A. Everett, Cleveland, Ohio; Vice-President, T. H. Smallman; other directors, E. W. Moore, P. W. D. Broderick, H. S. Holt, W. M. Spencer, C. H. Ivey.

The Montreal Tramways Situation.

The report of G. R. MacLeod, Railways and Tramways Engineer for the city, on the question of improved facilities for the transportation of passengers, was submitted to the Board of Control, Feb. 14, endorsed by City Engineer Janin.

The report is a most comprehensive document, but had not yet been made public when this was written. When its preparation was decided upon, the City Council had before it two propositions, one from the Montreal Tramways Co., and the other from the Canadian Autobus Co. Both companies made offers in the direction of the construction of subways, in order to relieve the congestion in the centre of the city. It is said that the report recommends the building of three subways or tube lines, having a total length of eight miles; ten subways under steam railways to replace level crossings, and the laying of a surface line along Vitre St., and sundry alterations on existing lines. The principal subway or tube line would run from Place Viger to Dominion Square, and would probably be the first to be built. The second main line would probably be along Burnside and Ontario streets, and the third would probably run from Craig St. to near the C.P.R. tracks. These tubes would be built so as to allow for extensions, and for connections being made with existing lines. The estimated cost, including land damages and the necessary equipment, is given at $30,000,000. The construction of subways under the steam railway tracks is considered independently of the proposition to elevate the G.T.R. tracks from Bonaventure station to St. Henri. It is estimated that if the construction of the various works mentioned is undertaken, it will require about eight years to carry them through. The report does not deal with the question of the Montreal Tramways Co.'s franchise, for the extension of which application has been made.

The report, it is said, favors the operation of autobus lines on Sherbrooke St., and similar streets where, for various reasons, electric railway tracks cannot be laid.

Nothing was done with the report at the meeting of the City Council, Feb. 17, but it is generally understood that the Council will submit a question at the munlcipal elections in April, asking the ratepayers whether or not they are in favor of granting the company an extension of franchise for 40 years. The answer to this question will influence the settlement of the whole question. The present franchise expires in 1922, so that a new 40 years franchise would really be an extension for 32 years. (Feb., pg. 87.)

Electric Railway Notes.

The London St. Ry. started its Sunday service Feb. 22.

The Electric Railways Construction Co. has been struck off the register of companies entitled to do business in British Columbia.

E. Lauzon, conductor, Montreal Tramways Co., who recently pleaded guilty to charges of theft of tickets from the farebox in his charge, was sentenced to one month in jail.

It is reported that a motor bus service is to be established in Guelph, Ont., early in the spring, covering territory not at present served by the local street railway.

The Niagara, St. Catharines and Toronto Ry. has ordered six interurban cars, three with smoking compartments, and three with baggage compartments, from Preston Car and Coach Co.

The London St. Ry. is reported to be considering the purchase of six additional cars, similar in type to those recently received from the Preston Car and Coach Co., and which were fully described in our January issue.

It is announced that the cars which the British Columbia Electric Ry. is displacing with new ones from the Preston Car and Coach Co. will be sent to the B.C.E.R. shops at New Westminster and rebuilt for general service.

A joint committee of the railway committee of the City Council and of the Board of Trade of Stratford, Ont., is taking up the question of the construction of radial railways under the Ontario Hydro Electric Commission's scheme.

The cars which the British Columbia Electric Ry. is receiving from the Preston Car and Coach Co., 21 of which were delivered between Dec. 12 and Jan. 12, are of the single ended, double truck type, with Westinghouse 101 B 2 equipment, and Westinghouse straight air brakes.

The Moose Jaw Electric Ry., which was originally incorporated under the British Columbia Companies Act, has been struck off the register of companies in that province. This incorporation was simply a preliminary step to the formation of the company under the laws of Saskatchewan, under which the company is now operating.

The Brandon, Man., City Council decided, Feb. 10, to do away with conductors on the municipal electric railway, and to close the rear door on all cars, so that passengers will have to enter and leave by the front. The passengers will put their tickets or cash fare into the farebox, and the entire car will be in charge of the motorman.

The Public Utilities Commission for Nova Scotia issued a decision, Feb. 8, on the application of the motormen and conductors of the Halifax Electric Tramways Co. for certain alterations in the conditions of their employment. The Commission declined to direct that 14 days instruction be given to motormen before they are regularly employed, and to order a 10 hour day with one day for rest in seven, on the ground that it was advisable to include the employes of other electric railways in the province under the one order, and before this could be made the Commissioners desired to hear representatives regarding other companies. The Commissioners also declined to order the equipment of the company's p.a.y.e. cars with air brakes, on the ground that the cars were not large enough to warrant the expenditure. In regard to the only other point brought forward, the Commissioners directed the company, before any new cars are put into service, to report fully as to the equipment of the same. The Commission promised to look into the question of hand brakes used on cars.

Halifax Electric Tramway Co.'s Annual Report.

An increase of $15,531 in net earnings for 1913 was reported at the annual meeting of the Halifax Electric Tramway Co. in Halifax, N. S., Feb. 9.

Gross earnings were $605,933, against $539,953 in 1912. Operating expenses were $337,008, an increase of $50,448. Dividends paid amounted to $112,000. Receipts from passengers totalled $301,771 against $250,263 in 1912. Electric light, power and sundry earnings totalled $242,085, as against $228,654 in 1912. Percentage of operating expenses to income increased from 54.06 in 1912, to 56.36 in 1913.

The directors were re-elected with the addition of Senator N. Curry, of Montreal, increasing the board to 12. E. A. Robert, Montreal, was elected President, and O. E. Smith, Halifax, Vice President.

Winnipeg Electric Railway Company's Annual Report.

The report presented at the annual meeting in Winnpeg Feb. 11 is given in full on immediately following page 148 of this issue.

The directors were re-elected for the current year as follows: President, Sir Wm. Mackenzie; Vice President, Sir Wm. Whyte; Secretary-Treasurer, F. Morton Morse; other directors, Sir Wm. VanHorne, Sir Donald Mann, D. B. Hanna, A. M. Nanton, Hugh Sutherland, R. J. Mackenzie.

Winnipeg River Power Co.—Following the meeting of shareholders of the Winnipeg Electric Ry., Feb. 11, a meeting of the shareholders of the W. R. P. Co. was held A preliminary report from a U. S. engineering firm was referred to, in which it was estimated that the Great Bonnet Falls are capable of producing 150,000 h.p. of electrical energy at a very low cost. It was decided to begin explorations and preliminary development work at once. J. G. White and Co., New York, have been engaged to do the necessary work, and it is expected that within two years the first units of the plant will be completed.

Marine Department

Canadian Lake Protective Association's Annual Meeting.

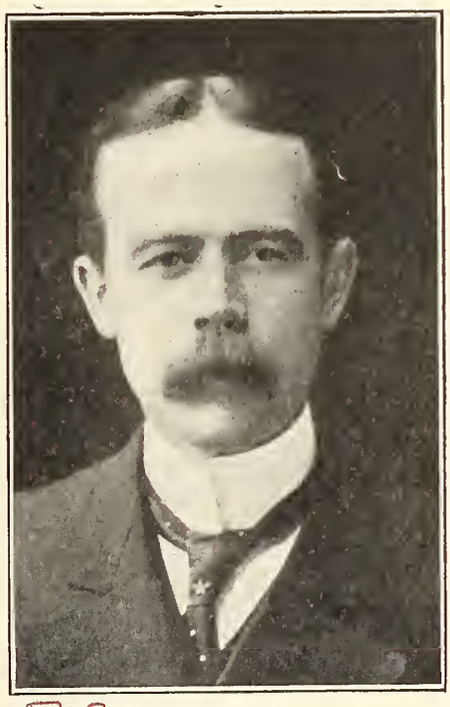
The following report, signed by L. Henderson, President, and F. King, Counsel, was presented at the annual meeting at Ottawa, Feb. 11.

The year just past, while it presents a record marred by the terrible disaster towards its close, shows a distinct step in advance in the work of the Association. Heretofore the Association has been unable to compile any accurate statement of premiums and losses from which to compute the loss ratio and determine any improvement which may have taken place from year to year. The need of accurate records of these figures has been quite apparent from the outset and painstaking attempts were at first made to secure them annually direct from members of the Association, but experience soon proved that this idea of compiling information from voluntary returns sent in by members would never produce statistics that could be relied upon as complete or accurate in any respect.

The scheme which has now been adopted did not propose itself until recently, and time was lost in consideration of a more complex arrangements designed to serve the double purpose of imposing part of the insurance risk on each member of the Association as well as providing a means of recording premiums and losses. Opinions wavered between proposals that the Association should, with legislative sanction, carry part of the insurance of the Canadian fleet of lake freighters, and alternative proposals that a company should be formed by members of the Association to carry a proportion of the risk and provide the desired records. Probably hesitation to embark in any such insurance scheme was fostered by a feeling, concurred in by leading underwriters, that the carriage of even a substantial part of the risk would not afford any greater incentive to owners to navigate their boats with caution than that which is found at present in the embarrassment and minor losses incident to every casualty and repair undertaking. It was just when this was generally agreed and when a full realization of the difficulties of any mutual insurance plan was reached, that Dale & Co., Ltd., of Montreal, suggested a simple plan which would provide the necessary record system and nothing more. In effect it was merely that the company named should write 5% of every risk enrolled in the Association. At the last annual meeting in Ottawa the matter received brief consideration but it was taken up again by your committee and after negotiations extending over a considerable period arrangements were completed with Dale & Co. The contract made with them provides that 5% of the risks on all steel hulls belonging to members of your Association shall be placed with the company named, who shall keep special records of the business and have them available at all times.

Unfortunately the year was so far advanced when the arrangement was completed that certain companies found themselves unable conveniently to place the necessary proportion of their risks, with the result that the plan is not yet in complete working order. Every member is bound, however, to comply with the arrangement this year and 5% of the insurable value of each hull risk will this year be written through the company named, so that commencing with this season complete records will be available. Every member of the Association is advised of the obligation to comply with the arrangement in accordance with the articles of agreement constituting the Association.

A lengthy correspondence took place early in the year with reference to the rate for 1913. Representations were made by letter and telegram from this Association and by its individual members through their respective brokers. Ultimately a rate substantially reduced below that of 1912 was announced by underwriters, and members of this Association were again accorded the same advantages as members of the Great Lakes Protective Association of the United States. Certain named fleets of the U. S. were accorded a special rate based upon their exceptionally good records, but for all other approved fleets a basis rate of 4¾% was fixed, applicable on the



P190 L. Henderson,
President, Dominion Marine Association.

Upper Lakes including Lake Erie, with a rate of 5¾% to Ogdensburg and 6¾% to Montreal.

A peculiar development arose later in the year with reference to the question of membership in the C. L. P. Association as a qualification for enjoyment of these rates in Canada. On July 31, F. Herrmann & Co. wrote asking whether the brokers for the steamships therein named correctly represented the views of your Association in insisting that the warranty of membership in your Association be removed from the policies. Copies of this letter were forwarded to the owners of the vessels named and by them to the brokers in question. The brokers' views were repudiated by counsel for your Association and the whole question was considered by your committee at its first meeting thereafter. It was then unanimously resolved that policies certainly ought to contain the warranty of membership, and that it was never suggested or intended by the Association or by your committee or its officers that the warranty should be omitted. Instructions were given to advise underwriters accordingly, repudiating the letter written to them by the brokers mentioned and asking that hereafter the warranty should appear. In accordance with the suggestion made by these underwriters in their reply letters to the same effect have been sent to other underwriters as well.

In connection with casualty reports relating to collisions in the ice at the opening of navigation in 1913 your committee has had occasion to consider the risk attendant upon an early departure of vessels from port while ice is still to be encountered. The conditions last spring were of course considered somewhat exceptional and therefore no action was taken by way of protest against an early opening of navigation; and at the same time inasmuch as the circumstances did not warrant condemnation of any master for having permitted his vessel to join the large fleet in Lake Superior in April, your committee refrained from censuring those whose vessels had encountered difficulties in the fields of ice. Nevertheless it is desirable that the risks of last spring should be avoided and your committee lay the question before you for consideration, suggesting that it receive some attention at the annual meeting. Favorable weather conditions and the hard work of the ice breakers alone prevented serious disasters in the blockade at the foot of Lake Superior. Your committee was in touch with the Marine Department with reference to the opening of the St. Mary's River and Whitefish Bay and held communication with the department by wire until the fleet was released.

Towards the close of the season the question of ice breaking at the close of navigation arose and your committee asked the Marine Department to take steps to keep the St. Mary's River and all upper lake terminal harbors open so long as necesasry to permit the last steamer out to make her port of destination. In reply the department intimated that the contract for ice breaking at Port Arthur and Fort William in force during 1912 would remain in force during 1913 up to Dec. 17, but that no arrangement had been made for ice breaking after that date and that weather conditions were such at the time of writing that it scarcely appeared necessary to anticipate any need of ice breaking operations. The Minister also expressed his opinion that your Association should join with the Government in discouraging an extremely late closing of navigation. The letter called attention to the disasters of the autumn as indicating what might be expected when cold weather and heavy gales were encountered simultaneously. Fortunately the weather conditions continued favorable and obviated the necessity for any further action in the matter. The customary extensions of insurance were granted by underwriters and navigation closed in 1913 in due course without any special incident of note.

Any consideration of the casualties of 1913 and of the work of your committee in connection therewith is overshadowed by the calamity which overtook so many staunch craft in November last. In a storm of unusual severity which occurred

on Nov. 8, 9 and 10 a number of vessels of Canada and the U. S. ran ashore and suffered severe damage, and a surprising number, of which four were enrolled in your Association, foundered and left no survivors of their crews. Three of these, the James Carruthers, Regina and Wexford sank in Lake Huron, and the fourth, the Leafield, went down in Lake Superior. At this date, and in the absence of any information as to the exact causes which led any one of these vessels to succumb to the seas, it is idle to speculate as to the reasons which contributed to their failure to ride out the storm. Official investigations are pending, and information of value may be developed as enquiry proceeds. Your committee can only deplore the regrettable loss of life and property and suggest that the Association may well accept and support any reasonable and well founded recommendations which may be made for safeguards or regulations designed to prevent so far as possible the chance of any repetition of this appalling disaster.

Only one wreck investigation in connection with this storm has been held in Canada up to the date of preparation of this report. This occurred in connection with the stranding of the Turret Chief, and as the finding of the Court in that case has been the subject of special consideration by your committee at the instance of the Marine Department which asked for an opinion upon the recommendations made in the finding, a letter was submitted to the Minister relating to this and to the larger question of the constitution of the court.

Your committee has met from time to time throughout the year at Toronto for the purpose of dealing with casualty reports and other regular business. Special attention has been given to conditions which appeared to contribute unduly to the dangers of navigation. A number of casualties occurred in the Lachine cut of Lake St. Louis, and in the Stone cut in the Welland Canal. The groundings in the Lachine cut have been largely due to inability to keep the Lachine ranges in view, and the addition of a range at the outer end of the channel has appeared desirable. A recommendation which has the approval of the local authorities has now been made for improvement of the lighting system with this end in view and its adoption is expected. As to the Welland Canal some consideration has been given to a proposal for regulations to prevent vessels from meeting in the Stone cut mentioned, or for the placing of booms or floats to prevent the contact of vessels with the walls. Correspondence is pending on this subject. A recommendation has also been renewed for the erection of some protecting device of a similar nature at lock entrances. Representations have also been made regarding the troubles engendered by currents at lock entrances, and casualties at the Canadian lock at Sault Ste. Marie have led to a suggestion for the extension of the pier at the upper entrance. The improvement of the upper entrance of the Morrisburg Canal has again been recommended, as well as the building of a guard lock at the head of the Lachine Canal. Your committee also concurred with a committee of the Dominion Marine Association in reiterating a complaint against the use of flashing lights in the Livingstone channel of the Detroit River and in the West Neebish channel of the St. Mary's River, as neither of these channels require a distinctive class of lights and masters complain of inability to keep a course properly with lights of this flashing character.

The higher water which has prevailed during the past season has rendered the question of the load draught in the various waters of less importance than in some preceding years. No complaints of overloading were filed with the Association by any of the canal superintendents during 1913. A record has been kept of the recommended draught in the various canals and prompt notice has been sent out of each change which has occurred.

Correspondence has been carried on as heretofore with masters regarding casualties requiring discussion, and in certain cases with parties able to throw light on the circumstances in question. The usual notes of casualties and of your committee's action in each case have been recorded. In the case of one fleet your committee found it necessary to report to the owners a statement that the vessels they owned were said to be running without regard to the Association's rules. An emphatic denial of the statement was made and was accepted by your committee.

Referring particularly to the casualties of the year an analysis of the accidents reported is appended. The outstanding feature is of course the complete loss of four vessels and the two serious strandings in the storm of November last. The claims upon underwriters in respect of these disasters will be heavy and will make the loss ratio for 1913 very high. Apart, however, from the unfortunate effects of this one storm it is noticeable that the remaining casualties do not include any one heavy loss, and their number rather than the total amount of damage done is to be regretted. Of the groundings noted, two or three involved substantial repairs, and these might have been classed as strandings save that they were not due to any stress of weather and the vessels were in all cases quickly released. The collisions exceed any other class of casualty in number, and might be expected to cause a large loss, especially as 14 out of the 34 recorded affected two vessels both belonging to your Association. But the fact is that in the great majority of cases the damage done was very light, 15 of the cases being due to movements of vessels in harbors and many of the others being light contacts of vessels in the canals.

In the case of five of the reported casualties the masters of the vessels were censured by your committee. One of these votes of censure was recorded for running in narrow waters in a fog, one for canalling in a heavy wind and three for going ashore by reason of failure to use the lead and to exercise ordinary caution. In one of these last named the master was dismissed and a wreck investigation applied for, and in another the master was put back as mate on another vessel. In six other cases masters were advised that your committee considered they had made errors of judgment or failed to handle their vessels as they should. Engineers were found at fault and censured in four instances, the vote being recorded in three instances for failure to answer the reverse signal properly. In the fourth case where steam was shut off the reverse gears, the second engineer, who was on watch, as well as the chief who was responsible, were both censured. In two other cases the vote of censure fell upon pilots of the upper St. Lawrence who were navigating the vessels. The action of your committee in regard to every casualty is reported as heretofore in a bulletin which is issued and circulated among all members of your Association and all masters after each meeting.

During the year your committee accepted the application for enrolment of two vessels of U. S. register owned in Canada and also decided to recommend that the privileges of membership in the Association should be extended in the same way whenever Canadian owners apply and the tonnage offered proves acceptable. A recommendation is hereby made accordingly.

You are asked to approve particularly the action of your committee in seeking to have all policies require a warranty of membership in your Association as a condition of enjoyment of any special rate, and your committee closes this report with an urgent reminder to every member of the Association that insurance must now be arranged so that 5% of the risk in each vessel shall be placed with Dale & Co. Strict compliance with this requirement is essential.

Analysis of Accidents Reported, 1913.

Foundered	4
Strandings	4
Groundings	26
Collisions	34
Striking docks or gates	11
Striking bridges, docks, piers, harbors and channel banks	16
Stress of weather causing substantial damage	1
Lost anchors	2
Total	98

FOUNDERED.

Lake Huron	3
Lake Superior	1
Total	4

STRANDINGS.

Lake Superior	1
Lake Huron	1
Lake Erie	1
Lake Ontario	1
Total	4

GROUNDINGS.

St. Lawrence River	10
Lake Ontario	3
St. Clair River	2
Lake Huron and Georgian Bay	4
St. Mary's River	2
Mission River	3
Sault Canal	1
Port Arthur	1
Total	26

COLLISIONS.

Harbors	15
St. Lawrence Canals	4
Welland Canal	7
Sault Ste. Marie Canal	2
St. Lawrence River	1
Lake Superior	2
St. Mary's River	2
Lake Erie	1
Total	34

STRIKING LOCKS OR GATES.

St. Lawrence Canals	7
Welland Canal	4
Total	11

STRIKING BRIDGES, DOCKS, PIERS AND HARBOR AND CHANNEL BANKS.

Bridges	2
Docks and piers	6
Canal banks and walls	7
St. Lawrence River channel bank	1
Total	16

STRESS OF WEATHER CAUSING SUBSTANTIAL DAMAGE.

Gulf of St. Lawrence	1

LOST ANCHORS.

Lake Superior	1
Gulf of St. Lawrence	1
Total	2

The report was considered clause by clause and unanimously adopted.

At present membership in the Association is confined to steel built bulk and package freighters. A resolution was adopted that an associate class should be formed for the enrolment of wooden tonnage at a special rate of assessment, which would be fixed by the executive committee. On this understanding the meeting endorsed the action of the executive committee in insisting upon the insertion in all policies of a warranty of membership in the Association.

The following were elected as the executive committee:—L. Henderson, W. E. Burke, Montreal; Capt. S. Crangle, H. W. Cowan, J. T. Mathews, Toronto; Capt. Fraser, H. W. Richardson, Kingston; J. Playfair, Midland. L. Henderson was subsequently re-elected President.

Dominion Marine Association's Annual Meeting.

At the annual meeting in Ottawa, Feb. 10, the executive committee presented a comprehensive report over the signatures of L. Henderson, President, and F. King, Counsel. The report showed that the tonnage enrolled in the Association steadily increases, at least in the way of vessels navigated by steam. Naturally the figures for barge and sailing vessels are slowly becoming less. The total tonnage exceeds that of 1912, and is approximately 180,000 net registered tons of steam and 33,500 of barge and sailing vessels, making a total of 213,500 net registered tons. The report dealt in full detail with the past year's work, including the following subjects:—Pilotage Commission; establishment of pilotage district, Montreal to Kingston; wireles telegraphy; rules of the road; proposed dam at head of Livingstone channel, Detroit River; Chicago Drainage Canal; the Grain Commission; Lake Shippers Clearance Association; dispatch at loading and unloading ports; shortages in outturns of grain cargoes; trimming of grain cargoes; coasting laws; the disaster of Nov. 8, 9 and 10, 1913; Seamen's Union bill, United States; life saving appliances, rules, sec. 578, Canada Shipping Act; London conference on safety of life at sea; Customs reports of entry into Lake Michigan; wages of engineers; ice breaking; patrol service, St. Mary's River, Sault Ste. Marie to Point aux Pins; canals, Sault Ste. Marie, Welland and St. Lawrence; harbor and channel improvements; Niagara River; aids to navigation; legislation; Lake Carriers' Association; Association of Passenger Steamboat Lines of the U.S.

The report was considered clause by clause and unanimously adopted.

The financial statement showed receipts, including balance from previous year, of $4,596.59, and disbursements $3,624.42, leaving a balance of $972.17, against $1,437.92 at the beginning of the year.

A petition from Midland (Ont.) Council 12, National Association of Marine Engineers of Canada, was read, asking for an advance in pay, but no action was taken, it being considered that the question is one to be dealt with by individual owners.

A petition to the Marine Department from masters of vessels navigating through the Dominion canals, in regard to the failure of bridge tenders to respond promptly to whistle signals blown by vessels requiring the opening of bridges, was endorsed.

A petition to the Minister of Marine from owners and masters of steamboats and launches on the Rideau River and Canal, asking for improvements in the lighting, was endorsed.

A committee on aids to navigation was elected as follows:—Robt. Fraser, Kingston, Chairman; Jno. Donelly, J. F. Sowards, W. H. Featherstonhaugh, Gilbert Johnston, Frank Hall, H. W. Cowan, H. M. Norris, and Capt. Jno. Ewart.

E. E. Horsey, J. Playfair, S. V. McLeod, and F. Plummer retired from the executive committee by effluxion of time, and H. W. Cowan, C. B. Harris, A. A. Wright, Toronto, and S. V. McLeod, Sault Ste. Marie, were elected to succeed them for a three year term. The other members of the committee whose terms expire in 1915 and 1916 are L. Henderson, Montreal; A. E. Mathews, J. W. Norcross, Toronto; H. W. Richardson, Kingston; G. E. Fair, Collingwood; H. H. Gildersleeve, Sarnia; D. Murphy, Ottawa; F. S. Wiley, Port Arthur.

The executive committee reelected the officers as follows:—President, L. Henderson; 1st Vice President, A. E. Mathews; 2nd Vice President, H. W. Richardson.

On the morning of Feb. 11, a large deputation of members of the Association waited on the Minister of Railways and the Minister of Marine and Fisheries in the former's office, being introduced by W. F. Nickle, M. P., for Kingston. The Association's Counsel, F. King, addressed the Ministers, thanking them for the cordial relations which had existed between their departments and the Association throughout the past year, and expressing the Association's recognition of the great difficulties with which the Ministers had to contend in directing operations over the immense fields which came under their jurisdiction and in trying to satisfy the needs of all parties interested, and assured the ministers of the Association's intention to endeavor to continue to deserve the consideration which it had received in the past. The opportunity was also taken to lay before the Minister of Railways and Canals requests which have been under consideration for some time for the improvement of lock entrances, by the erection of spring piling or floats, to prevent collisions with wing walls, and for a system of signals by whistles or semaphores on the various bridges crossing the canals for the purpose of answering whistle signals from approaching vessels. H. W. Richardson of Kingston, also spoke on behalf of the Association. The deputation was very cordially received and the ministers expressed deep appreciation of the unusual character of the representations made. Very favorable consideration was promised for the two special requests above mentioned.

The Association's annual dinner at the Ottawa Golf Club in the evening was a most enjoyable affair. The speakers were the President, L. Henderson; and Vice Presidents, A. E. Mathews and H. W. Richardson; Hon. J. D. Hazen, Minister of Marine; Col. the Hon. S. Hughes, Minister of Militia; Lt.-Col. Currie, M.P.; Dr. Edwards, M.P.; W. F. Nickle, M.P.; A. Johnston, Deputy Minister of Marine; J. A. McGean, Cleveland, Ohio; A. Pissanault, Detroit, Mich.; F. S. Wylie, Port Arthur; H. W. Cowan, Toronto, and Acton Burrows, Managing Director, Canadian Railway and Marine World.

Farrar Transportation Company's Annual Report.

The Farrar Transportation Co., Ltd., held its annual meeting at Collingwood, Ont., Jan. 27. Following are extracts from the annual report. A dividend of 10% and a bonus of 5% were paid for 1913. The dividends that shareholders have now received aggregate 101%, hence the amount invested by the original shareholders has been returned to them in full. The bonded indebtedness on the s.s. Collingwood has been reduced from $94,000 to $81,000, $13,000 having been paid on the principal maturing 1913, and $4,375 interest on bond issue. These two items, aggregating $17,373, were provided for out of earnings and equal approximately 7% on the capital stock. After deducting the amount required to pay 15% dividend on 1913 business, $27,500, there is approximately enough left on hand to take care of s.s. Collingwood's bond interest and principal for the three succeeding years 1914-15-16, which shows the company is in a strong financial condition. The assets and liabilities account now shows that the assets over liabilities amount to $163,976.63, which makes the intrinsic value of the stock $165.55 a share. The s.s. Collingwood went into service April 16, 1913, and was kept steadily engaged until early in December, carrying during that time 23,000 tons of iron ore, 3,000 tons of pig iron, 31,000 tons of coal and 5,300,000 bush. of grain. The s.s. Meaford started on April 19 and was kept steadily engaged during the entire season, carrying 6,000 cords of pulpwood, 10,000 tons of coal and 1,500,000 bush. of grain.

Assets.

Two steamships	$408,409.03
Office furnishings	448.84
Cash in bank	81,768.95
Accounts receivable	5,828.03
	$496,454.85

Liabilities.

Detroit Trust Co.	$ 81,000.00
Accounts payable	1,478.22
Shareholders	250,000.00
Assets over liabilities	163,976.63
	$496,454.85

Earnings and Expenses.

Gross earnings	$166,620.33
Expenses, fuel, wages, insurance, provisions, etc.	95,384.33
General expense	4,955.56
Interest	3,504.07
Net profit	62,778.37
	$166,620.33

The board was re-elected as follows:—President, T. 1. Thomson, Owen Sound, Ont.; Vice President, E. R. Wayland, Fort William, Ont.; Secretary-Treasurer and Managing Director, G. E. Fair, Collingwood, Ont.; other directors, E. Stubbs, Sault Ste. Marie, Ont.; D. D. Lewis, Lorain, Ohio; W. E. Allen, Toronto; M. Snetsinger, Thornbury, Ont.; G. P. Pearsall, Collingwood, Ont.; Jno. Shultis, Port Colborne, Ont.; C. I. De Sola, Montreal; the latter succeeding W. T. Toner, of Collingwood, deceased. It has been decided to move the head office from Collingwood to Toronto in the near future.

Pilotage on the St. Lawrence.

In the recent annual report of the Liverpool, Eng., Underwriters Association, reference was made to pilotage on the St. Lawrence, as follows:—"The committee is glad to be able to state that in consequence of reiterated complaints the whole question of St. Lawrence pilotage has been under investigation by a Royal Commission. It is earnestly hoped that in the interest of the increasing number and size of vessels frequenting the river, the recommendations of the commission for the better organizing and administering of the pilotage will bring about material reduction of the risks of navigation in this important waterway." The attention of the Minister of Marine having been called to this matter, he stated in the House of Commons, Feb. 16, that in so far as the department was competent, all the recommendations submitted by the Royal Commission material to the administration of the service, had been approved and put into force. Certain of the recommendations cannot be put into force without amending the Canada Shipping Act. The necessary amendments will be considered in the bill for the revision and consolidation of that act, which will be submitted to Parliament at an early date.

Largest Marine Diesel Engine.—The recent arrival of the ship Wotan in New York is of interest because she is propelled by a single screw, six cylinder, 2,000 Carels-Diesel marine engine. Other motor ships that have gone to New York were driven by two engines of 6 or 8 cylinders, whose gross capacity was about 2,000 h.p., and in each case they were supplied with injection air by additional engines. The motor of the Wotan is a six cylinder engine, with an injection air compressor on the engine. This is the largest marine Diesel engine in service, and the good record of the ship on her maiden voyage is claimed to be a proof of the reliability of this type of drive.

Large Freight Steamship Building at Port Arthur.

What is claimed to be the largest bulk freight steamship in the world is being built at Port Arthur, Ont., for Canada steamships Lines, Ltd., and at the end of February was about 60% completed. It is expected that she will be launched at the end of March, and that she will be delivered at the opening of navigation. She will have room for 585,000 bush. of oats, or approximately 20 trains of 30 cars each. She will be 625 ft. long, 59 ft. beam and 32 ft. deep, with a water bottom and side tank 5½ ft., extending from the keel up to the main deck, and from the collision bulkhead back to the engine bulkhead, and divided by a centre keelson, side bulkhead and solid floors into 15 watertight compartments, which may be flooded or pumped out individually, as conditions may require. The construction is on the Isherwood system, consisting of longitudinal frames, with transverse sections of plate and angle, spaced every 12 ft. The cargo hold, extending 436 ft. will be divided into six compartments by five solid steel bulkheads, entrance to which will be gained by 38 steel hatches opening from the spar deck and spaced 12 ft. centres. These hatches will be 9 ft. wide by 41½ ft. long, and will be covered with sectional steel plate folding covers, operating by steel cables from two deck winches and clamped down with a patent hatch fastener, especially designed for this type of cover.

The power plant will consist of one vertical, triple expansion engine, with cylinders 24, 39, 65 by 42 in. stroke, with h.p. cylinder in the centre, and indicated horse power of 2,000 at 85 r.p.m. Steam will be furnished by two Scotch boilers 16 ft. dia. by 11½ ft. long with induced draught working under a pressure of 170 lbs. per square inch. The steering engine will be of the direct acting type, with 9 by 9 in. cylinders, operated with telemotor gear; also steam gear so arranged that the change can be made in a very short time. The electric lighting plant will consist of two 15 k.w. generating sets installed in engine room, with separate circuits fitted for the different parts of the ship, and including electric mast head, stern and side lights so arranged that should any of these lights go out the fact will be instantly noticed in pilot house by pilot lights installed therein, which will become lighted. One of the two 10 by 36 in. whistles will also be electrically controlled. A feature very seldom found in the freighters will be the installation of an ice machine large enough for refrigerator coils and ice tank of two tons capacity.

The spar deck forward will be fitted up for passengers and will be finished in full panel of mahogany, containing four staterooms and bath, opening off of a large reception room which will communicate by stairs to an observation room on the forecastle deck, directly overhead. The captain's quarters will be in the texas and will be finished in quartered oak, and include office, bedroom and bath, with a stairway leading directly overhead into the pilot house. The forward crew's quarters will be located on main deck and will be finished in oak with white pine ceilings, each room containing berth for two people with exception of mate, who will have separate room. These quarters will include bathroom, shower bath and large reading room. The after deck house will contain private dining room for passengers, finished in quartered oak, with white pine ceiling, and dining room for officers and mess room for crew. The chief engineer's quarters will consist of office and bedroom and bath, and forward of him will be the assistant engineers', oilers', and firemen's rooms in separate quarters on starboard side, and the port side will contain quarters for deck hands, stewards, galley and ice box. The Western Dry Dock and Ship Building Co. are the builders.

Canada Shipping Act Amendments.

With reference to the recent extension of the time for the participation in the coasting trade of Canada, by certain foreign vessels, an amendment to the Canada Shipping Act is before the House of Commons repealing the section defining the meaning of what constitutes a coasting voyage, and substituting a new section as follows:

"(f) 'Coasting voyage' means a voyage between any port or place on the eastern coast of Canada, and any other port or place on such coast, or in Newfoundland, Labrador, or St. Pierre or Miquelon, or any port or place on the eastern coast of the United States of America or Mexico or Central America or in the West Indies, or on the eastern coast of South America not further south than 40 degrees south latitude; and also means a voyage between any port or place on such coast, or on the western coast of the Territory of Alaska, or of the United States of America or of the western coast of Mexico or Central America or South America not further south than 40 degrees south latitude."

The Hon. J. D. Hazen, Minister of Marine, speaking at the Dominion Marine Association's annual dinner at Ottawa, Feb. 11, said:—An important piece of legislation on the subject of merchant shipping will be submitted to Parliament within the next few weeks. As you are aware, the present act is merely a collection of the various acts, with amendments that have been passed during the last 40 years. So many changes and improvements have taken place in that time in shipping matters that it has become necessary, practically, to rewrite the whole act so as to meet the requirements of the present day. The changes in the proposed bill are not of a very radical character. The idea has been rather to provide a code for our merchant shipping that will be worthy of the important place Canada holds in the maritime world. I propose, on the second reading of the bill, to move that it be referred to the special committee on Marine and Fisheries for consideration. This will enable the shipping interests of the Dominion to examine the details of the measure and to be heard in regard to any changes they deem necessary. And I think that I could have no more fitting opportunity than now of asking the hearty co-operation of all those who sit round this table, and whose interests are so deeply identified with this great branch of Canadian industry and enterprise, to make the new Canada Shipping Act a valuable addition to our legislation as well as a real and helpful measure to all branches of the business.

Debenture Issue by Canada Steamship Lines, Limited.

The Canada Steamship Lines, Ltd., offered in England and in Canada, from Feb. 11 to 14, £1,300,000 5% consolidated 1st mortgage debenture stock at 93, repayable Aug. 15, 1943, at 105. The subscriptions are payable 10% on application, 25% on allotment, 25% on Mar. 16, and the balance on Apr. 15. The debenture stock is constituted by a trust deed under which is secured by a conveyance to the trustees, or by special mortgage in their favor, the freehold and leasehold lands, buildings and steamships, and shares of other companies owned or hereafter to be acquired, and a general charge upon its property, assets and undertaking. The deed provides for an accumulative sinking fund of 1½% per annum, commencing in 1915, to be applied in the purchase of stock at any price less than 105% and accrued interest, or invested in the manner prescribed in the deed. The company reserves the right to redeem the stock on any interest date after Aug. 15, 1923, at 105%, or earlier at the company's option, at 110% on six months notice. Full details of the valuation of the properties and past earnings, etc., have been given in previous issues of Canadian Railway and Marine World. London cablegrams state that about 15% of the stock was subscribed for by the public, the balance being left with the underwriters.

Improvements in Aids to Navigation on the Great Lakes.

The Hon. J. D. Hazen, Minister of Marine, made an important announcement at the Dominion Marine Association's annual dinner at Ottawa, Feb. 11, in regard to works to be carried on this year He said:—"I am anxious that the very large and rapidly growing shipping interests on the Great Lakes should receive the greatest possible assistance that improved aids to navigation can afford. To this end I directed that the officers of my department who are members of the Lighthouse Board should, during the last season, make an inspection of the several locations represented as requiring additional aids. In addition, I have endeavored to familiarize myself personally with conditions on the lakes. I hope that, as a result of these inspections, the officers and myself have a proper appreciation of what is required, and our aim will be to carry them out. To that end, the following aids will be established during next season:—

"Main Duck Island. First rate light and fog alarm station, $41,500.

"Battle Island. Fog alarm, $10,800.

"Port Burwell. Gas lit concrete beacon on breakwater head, $3,100.

"Slate Islands. Fog alarm and improvement of the light, $12,300.

"The lights at the following stations are to be improved:—Brebeuf range, $1,200; Giant's Tomb, $1,400; Long Point west light, $1,275; Long Point east light, $4,900; Lyal Island, $1,250; Mississagi Island, $1,275; Nine Mile Point, $1,000; Nottawasaga Island, $7,675; Otter Head, $1,275; Peninsula Harbor, $1,300; Hope Island, $1,275; Killarney West, Mohawk Island.

"Bay Point, Sarnia, gas lighted beacon. Brebeuf back range lighthouse to be rebuilt, much higher, in steel.

"Goderich. Improvement of main light and establishment of an electric fog horn at outer breakwater beacon, $3,050.

"Limekiln Crossing. Pair of permanent range lights to replace three pairs of temporary lights, $4,000.

"Livingstone Channel. Light at upper entrance, $40,000.

"Martin Island, south end of Chenal Ecarte. Range of lights, $300.

"Wingfield basin. Lighting of existing day beacons, $50."

Imperial Service Medals have been awarded to the following Government employes for long service in connection with navigation:—J. Collins, lock master, Welland Canal; J. J. Gordon, lock master, Rideau Canal; and C. H. Collier, lock master, Welland Canal.

The name of the Government dredge Ontario has been changed to P. W. D. no. 114.

National Transcontinental Railway Car Ferry for St. Lawrence River.

The ice breaking car ferry steamboat, which is under construction at Birkenhead, Eng., for the transportation of N.T.R. trains across the St. Lawrence River pending the completion of the Quebec Bridge, was launched at Birkenhead, Jan. 31, and delivery at Quebec is expected in May or June. A preliminary description was published in Canadian Railway and Marine World for May, 1913, and the following fuller information is now available.

Principal dimensions are:—Length overall, 326 ft.; beam, 55 ft.; with a mean draught of about 15 ft. The propelling machinery will consist of two sets of triple expansion condensing engines, steam being supplied by 8 single ended cylindrical boilers working under natural draught. An ice propeller will be fitted at the forward end, driven by a compound condensing engine. The vessel will be built to Lloyds' special survey and will be arranged for the carriage of passenger and freight trains at all seasons.

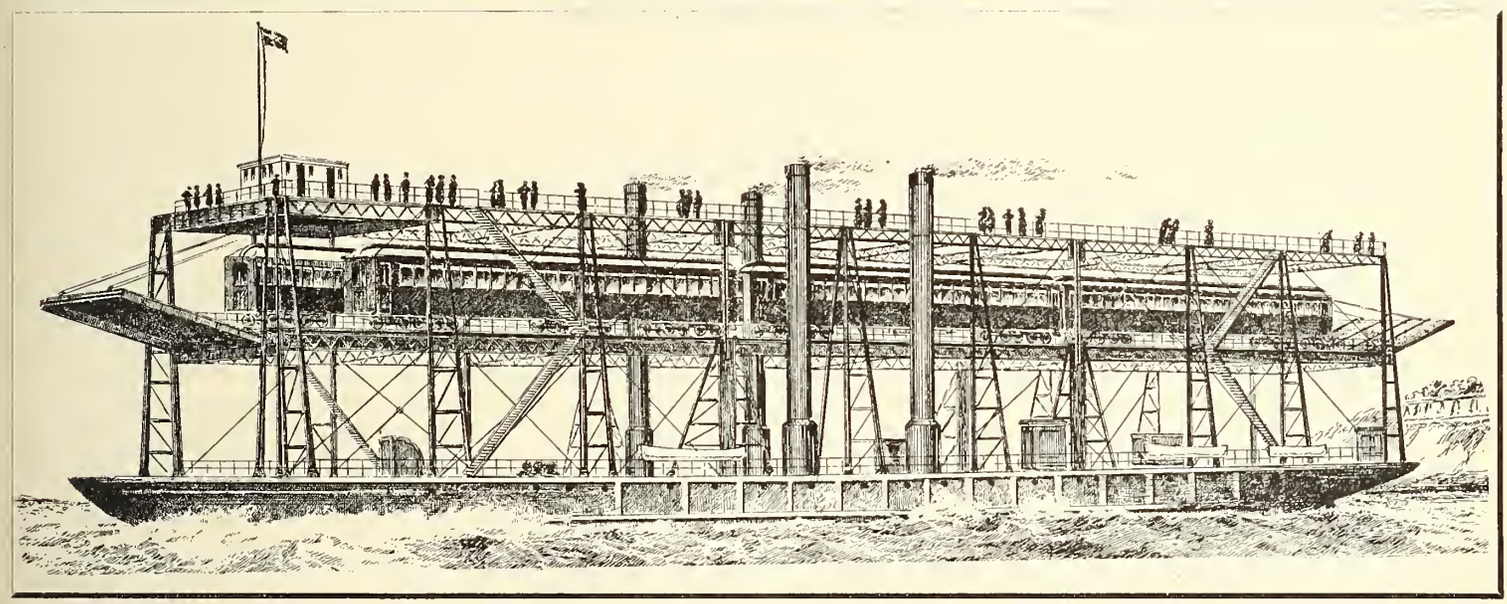
The trains will be carried on a tidal deck arranged above the main deck of the vessel, on three lengths of track, the length of each track being about 272 ft., which will accommodate a standard passenger train of 1 locomotive, 3 express and baggage cars, 3 passenger cars, and 3 sleeping cars; or a standard freight train of 18 loaded freight cars. The tidal deck will rest on large gunmetal nuts working up and down on 10 vertical lifting screws on each side, supported on columns, the columns being stayed by lattice buttresses against longitudinal and transverse thrusts. The lifting screws will be hung on ball bearings from the top and will be manipulated by means of worm wheels driven from horizontal shafting which will run the length of the vessel on each side. The horizontal shafting will be worked by bevel gearing from a four cylinder high pressure engine of special design situated below the main deck. The gearing will be arranged to lift the tidal deck fully loaded at a rate of 1 ft. a minute, through a distance of 18 ft., which will enable the ferry to be loaded or unloaded at any state of tide. At each end of the tidal deck an adjustable hinged gangway will be suspended, which will allow for any change of trim or heel of ship due to unequal distribution of weights while taking the cars, etc., on or off the vessel. Above the highest position of carriages on the tidal deck, a promenade will be arranged all round the vessel, with a bridge platform forward, from which all the operations of steering and manoeuvring will be directed.

The boiler rooms will be arranged in wing compartments amidships, with the coal bunkers and the tidal deck engine room between them. The main propelling engines will be situated abaft the boiler rooms and the engine for the ice propeller will be placed in the hold just abaft the fore peak bulkhead. The vessel will be fitted with electric light throughout and electric gear will be provided for raising and lowering the end gangways and for hauling the cars on or off. Special arrangements will be made for heating the passenger cars during transit. Double windlasses will be fitted, one on each side, with slip drum for mooring. Accommodation will be arranged on flats below the main deck forward on both sides of ship for officers and crew.

The propelling machinery will consist of two sets of triple expansion surface condensing engines, the size of cylinders being 23, 35, and 55 dia. by 33 in. stroke. They are designed to run at 120 revolutions a minute; and a special feature of the engines is the shafting, which is made much stronger than usual, to stand the shock it will receive when the propellers strike ice during the winter trips. The propellers themselves will be specially strong for the same reason, being made of nickel steel. The engines will be supplied with steam by eight single ended boilers, under natural draught at a pressure of 165 lbs. per sq. in.

The forward end of the vessel will be fitted with an ice breaking propeller, driven by a set of compound surface condensing engines, the size of cylinders being 15, 32 by 21 in. stroke. This propeller, which will also be of nickel steel, will run idly during the summer. The engine will be of the four cylinder, high pressure type of massive design, driving through double helical spur wheels, a second motion shaft running athwartship; at both ends of this shaft will be arranged a pair of mitre wheels, driving the fore and aft main line shafting, on both port and starboard sides. At equal distances along this shaft will be arranged the worm and wheel gearing for turning the screws, 10 on each side of vessel, that is 20 for the whole ship. The worms will be of forged steel and the wheels of cast iron. The screws will be driven through a loose forged steel sleeve and sliding key arrangement fitted into the box of wheel; the screws will be fitted with heavy gunmetal nuts, screwed with buttress threads, and will be supported from the upper structure of the vessel by ball bearings of special design. A complete installation of auxiliary machinery will be fitted, and the whole made to Lloyds' requirements. It is said that she will be named Leonard, after the Chairman of the N.T.R. Commission.

We are indebted to W. J. Press, Mechanical Engineer, N.T.R. Commission, for the foregoing information.



National Transcontinental Railway Car Ferry for St. Lawrence River.

The Recent Great Lakes Disaster.

The Minister of Marine stated in the House of Commons recently, in connection with the suggested appointment of a commission to investigate the wrecks caused on the Great Lakes in the storm of Nov. 9, 1913, that soon after the disaster steps were taken to ascertain if it was the intention of the United States, whose shipping had sustained greater loss and damage than the Dominion's, to appoint any commission of investigation, and it was learned that there was no such intention. His department believed that any inquiry, to be effective, should be international in character, and in view of this, and of the further fact that it was the announced intention of a member of Parliament to move for the appointment of a parliamentary committee of inquiry, it was decided that the appointment of a commission was not desirable, nor necessary.

The following Canadian vessels which were stranded during the storm have been the subjects of investigation by the Dominion Wreck Commissioner:—Turret Chief, owned by Canadian Lake and Ocean Navigation Co.; Acadian, owned by Canada Interlake Line; results, masters censured.

National Council Marine Engineers of Canada.—The following officers were elected at a meeting in Kingston, Ont., recently:—Grand President, L. B. Cronk, Windsor, Ont.; Grand Vice President, A. F. Hamelin, Montreal; Grand Secretary Treasurer, N. J. Morrison, St. John, N.B.; Grand Conductor, E. Reid, Vancouver; Grand Doorkeeper, A. J. Ross, Halifax, N.S.; Grand Auditors, J. Gillie and A. E. Kennedy, Kingston, Ont.

Atlantic and Pacific Ocean Marine.

The C.P.R. s.s. Tyrolean, which has been withdrawn from the Austrian service, will, it is reported, be placed on a route between St. John, N.B., and Avonmouth, Eng. The first sailing was scheduled for Feb. 28, from St. John.

With reference to the report that Furness, Withy and Co. have ordered four additional steamships for its North Atlantic service, as mentioned in our last issue, we are officially advised that no intimation to this effect has been received at the Montreal office.

The Royal Mail Steam Packet Co.'s s.s. Cobequid, which was wrecked recently in the Bay of Fundy, was insured for £30,000.

The maiden voyage of the Allan Line s.s. Calgarian, has been postponed from Feb. 28 to Mar. 28, when she will sail from Liverpool for Halifax, N. S., returning from the latter port, Apr. 11.

Capt. A. W. Davison, of the C.P.R. s.s. Empress of India, has been promoted to the command of the s.s. Empress of Russia, vice Capt. Beetham, who has been appointed Marine Superintendent at Vancouver, B. C. On Capt. Beetham giving up the command of the vessel, the officers and crew presented him with a silver flower stand suitably engraved.

The Canadian Northern Steamships Ltd., it is reported, will make its summer terminus at Quebec this year instead of Montreal, as formerly. D. B. Hanna, Second Vice President, when questioned on the matter in Toronto, recently, is reported to have stated that though such a change was under consideration, no decision in the matter had been arrived at.

The Isthmian Steamship Co.'s s.s. San Francisco, which was recently launched at Londonderry, Ireland, is to be used for the New York-British Columbia steel carrying trade. She was scheduled to sail from New York, for Victoria, B.C., on Mar. 10, but it was not expected that she would be completed in time. She has about 9,000 tons carrying capacity.

The Bermuda Legislative Council has passed a bill to subsidize Canada Steamship Lines to the extent of $80,000 a year for a weekly steamship service between Bermuda and New York, commencing Jan., 1915. A 10,000 tons passenger steamship is to be provided, having a speed of 18 knots an hour and capable of developing 21 knots. A second similar vessel is to be provided later on payment of a similar subsidy.

The Reid Donald Steamship Co., Ltd., the incorporation of which was announced in a recent issue, has purchased the s.s. Bellona, formerly owned by the Thomson Line, and which stranded below Quebec towards the end of 1912. She has been thoroughly overhauled and repaired and will be used in the fruit trade between the West Indies and New York ports. C. I. de Sola, T. Muirhead and G. Farrill, Montreal, are interested in the company.

Capt. F. Inch, commander of the Uranium Steamship Co.'s s.s. Volturno, which was burnt at sea, Oct. 11, 1913, when a number of the passengers and crew lost their lives, was presented, Feb. 4, with the freedom of the City of London, Eng. The parchment was enclosed in a silver casket, and accompanied by a gold medal, a gold watch and chain, a purse of gold, and Lloyd's silver medal, and also a diamond and sapphire pendant and silver tea service for Mrs. Inch. The Lord Mayor made the presentation, and stated that the tokens were in recognition of heroism and staunch allegiance to duty.

Press reports state that the Hamburg-American Line will put six steamships on the Canadian route during the forthcoming season, the first sailing from Hamburg being scheduled for Apr. 14. Third class passengers only will be carried. It is stated that berthing accommodation has been assigned to the company by the Montreal Harbor Commissioners at the Tarte pier. H. F. Dorgeloh is reported to have ben appointed Canadian Manager. Since the foregoing statement has appeared, it has been reported that instructions given for remodelling a number of vessels for the sole accommodation of third class traffic have been cancelled.

As an outcome of the discontinuance of the agreement hitherto in force among the member companies of the North Atlantic Conference, by which the European Continental- emigration business was- pooled and apportioned to various companies on a percentage basis, there appears to be the possibility of a severe rate war among the companies immediately concerned. It is said that the C.P.R. has played the chief part in the break up of the agreement, owing to the firm stand it took when it commenced its Austrian service and withdrew from the conference. This action was followed by the arrest of its Austrian agent, and the closing of its offices in Austria, but these have been reopened and certain restrictions have been placed on the business done. The intention of the foreign lines seems to be to drive the C.P.R. out of the continental trade, and it is reported that a reserve fund of a considerable amount is to be used to conduct a rate war against that company. It was announced early in February that the C.P.R. had issued new rate cards to its shipping agents, fixing the steerage rates at $22 eastbound, or westbound, except to and from Libau, Russia, where the rate is $24. Press reports of recent date state that the agreement is to be renewed with the C. P. R. as a party.

Maritime Provinces and Newfoundland.

We are officially advised that the Reid Newfoundland Co. has not ordered the building of an additional steamship in Scotland, as reported in the daily press.

Dominion Public Works Department surveyors were sent to Halifax, N. S., early in February, to view a proposed site for the establishment of a Government dry dock, and to report thereon. It is reported that the site which will probably be chosen is situated at Tufts Cove on the Dartmouth side of the harbor, and that a dock of the first class, similar to those to be built at Lauzon, Que., and Esquimalt, B.C., but somewhat larger, has been decided on by the Government.

The Dominion Public Works Department has been dredging the northern entrance to Little Bras d'Or, to obtain a channel 120 ft. wide, 20 ft. deep at low water over the bar at the entrance for about 2,400 ft. long, and a channel 80 ft. wide, 18 ft. deep at low water inside the bar, for a further 2,100 ft. In about the middle of the outside channel the 20 ft. depth at low water is at present available in a width of about 60 ft. only, and a depth of 18 ft. is available in a width of about 80 ft. In the inner channel a depth of not less than 17 ft. at low water is available throughout its entire length.

Province of Quebec Marine.

The Minister of Marine has given notice in the House of Commons of two resolutions providing for loans of $15,000,000 and $2,000,000 to the Montreal and Quebec Harbor Commissioners respectively.

By an order of the Superior Court, Larue and Trudel, Quebec, have been appointed liquidators of the National Navigation Co. Ltd., Quebec, with P. Desforges, Montreal, and A. Gingras and P. Gauvin, Quebec, as inspectors.

The press reports to the effect that Canada Steamship Lines, Ltd., intended taking the s.s. Quebec off the Montreal-Quebec run, are premature. The matter has not been under consideration officially, but it is possible that some change in the route of the vessel may be made by the time navigation reopens.

The Quebec and Lotbiniere Navigation Co. Ltd., the incorporation of which has been mentioned in a previous issue, will, it is stated, operate the steamboats St. Croix and L'Etoile during the forthcoming season between Quebec, Deschaillons, St. Antoine and St. Croix, on a tri-weekly service. The company owns wharf accommodation at Deschaillons, St. Antoine and St. Croix. The President is Capt. F. Boisvert, and the Manager, D. Boisvert, with head office at St. Croix, Que.

Ontario and the Great Lakes.

A. W. McMaugh, who died at St. Catharines, Feb. 18, aged 60, was for many years a captain of vessels on the Great Lakes on the Montreal-Chicago route.

The Ontario Transportation and Pulp Co., Ltd., the incorporation of which was mentioned in our last issue, is closely allied with the Ontario Paper Co., Thorold, Ont.

The Canadian Dredging Co., Ltd., has been granted supplementary letters patent under the Ontario Companies' Act, to increase its capital from $175,000 to $1,000,000.

The Canada Steamship Lines s.s. Stadacona, while anchored at Port Huron, prior to unloading, Feb. 3, grounded. Her cargo had to be lightered before she floated.. The damage was slight.

Capt. N. Campbell, of Owen Sound, is reported to have been given the command of the large freight steamship which is under construction at Port Arthur for Canada Steamship Lines Ltd.

Capt. John Boyd, a well known lake mariner, and for many years with the Montreal Transportation Co., died at Kingston, Feb. 10. He retired from active service a few years ago.

The Silver Islet Navigation Co., owning the steamboat Forest City, has leased the vessel to J. T. Reid and Co., Fort William, for operation during the summer season to the Silver Islet summer resort.

C. D. George, hertofore Travelling Freight and Passenger Agent, Northern Navigation Co., Montreal, has had his headquarters moved to Sarnia, Ont., where W. R. Burgin, Travelling Freight and Passenger Agent, also has his headquarters..

The Hamilton Board of Control has recommended to the City Council the granting of $5,000 to the Harbor Commission, in accordance with the commission's promise that should the city make such a grant the harbor would be freed from tolls.

The Public Works Department has recently completed dredging in the channel between the piers, in the turning basin and the coal slip, at Rondeau. The coal slip has been dredged to a depth of 17 ft., and the remainder to 20 ft.

On the New York State Canals during 1913 2,602,035 tons were carried. The tonnage eastbound was 1,980,517, and westbound 621,518. The tonnage per canal was as follows: Erie, 1,788,453; Champlain, 554,892; Oswego, 61,554; Cayuga and Seneca, 149,874; Black River, 47,262.

The Ogdensburg, N.Y., Shipmasters' Association has sent a resolution to Washington, to be laid before Congress, recommending that the St. Lawrence River be deepened between Cape Vincent and Ogdensburg, so as to make it navigable for the largest lake vessels.

The Northern Navigation Co.'s coal chutes at Point Edward, which were destroyed by fire recently, are to be rebuilt so as to be ready for the reopening of navigation. The structure will be about 14 ft. higher than the old one, so that there will be no difficulty in handling the s.s. Noronic, or any other of the larger vessels.

The Prescott and Ogdensburg Ferry Co.'s steamboat City of Belleville was burned to the water's edge at her dock in Prescott, Feb. 17. She was built at St. Catharines, Ont., in 1878, and was screw driven by engine of 50 n.h.p. Her dimensions were, length 89.7 ft., breadth 15.4 ft., depth 7 ft., tonnage 101 gross, 69 register.

We are officially advised that the Northern Navigation Co.'s s.s. Saronic will, in all probability, be transferred from its previous route to the head of the Great Lakes, to the Hamilton-Montreal or Toronto-Montreal route. This latter route is under the direct control of Canada Steamship Lines, Ltd., of which the Northern Navigation Co. is one of the constituents.

The Department of Marine has under consideration the placing of a special fog alarm at the outer end of the north breakwater pier at Goderich. It is probable that a 3 in. diaphone alarm operated by electricity will be installed, but on account of the position being so exposed to attack by surf, it is a difficult matter to get either a wave proof structure, or the necessary electrical connection.

The Rainy River Navigation Co.'s officers and directors for the current year, as elected at the recent annual meeting, are as follows:—President and Manager, G. A. Graham, Fort William; Vice President, D. C. Graham, California; Secretary-Treasurer, J. T. Horne, Fort William; other directors, F. Babe, Fort William, and A. R. Bartlet, Windsor, Ont. A. McKenzie is General Passenger Agent.

A press dispatch, dated Feb. 4, from London, Eng., credits the London Daily Mail with stating that another Canadian steamship combination, in which the G. T. R. and Canadian Northern Ry., are stated to be interested, is being launched. The "news" is somewhat belated, as from the details given, the item refers to Canada Steamship Lines, Ltd., a combination which is already an accomplished fact.

A second lodge of the Ship Masters Association was inaugurated at Port Arthur recently. The association is composed of members holding masters' certificates issued by either Canadian or U. S. authorities, and of associate members who are interested in the business. The officers for the current year are,—President, G. Stitt; Vice Presidents, A. Morrison and J. Friday; Treasurer, A. Fader; Secretary, O. Marin.

The annual meeting of Canada Steamship Lines, Ltd., was held at Montreal, Feb. 11. The business was purely formal to complete the details in connection with the organization, and to elect directors for the current year. The board, as given in a recent issue, were re-elected. Another meeting of shareholders will be called in about a month, when full reports of the earnings of the different constituent companies, for the past year, will be presented.

During the 1913 season the Public Works Department carried out considerable dredging at Port Stanley. At the extreme outer entrance to the channel, eastward and southward of the outer end of the west breakwater, an area 530 by 300 ft. has been dredged to 22 ft. depth, and a small area immediately south of the east pier, and the channel between the east and west piers, have been dredged to a depth of 20 ft., while the inner harbor has been dredged to 19 ft.

In connection with the projected harbor works at Toronto, the Minister of Public Works, in answer to questions in the House of Commons recently, stated that the contractors, with the approximate unit prices of their respective contracts as awarded by order in council, Sept. 15, 1913, are as follows:—Canadian Stewart Co., $5,371,372.17; Quinlan and Robertson, $5,735,567.17; Laurin, Leitch nad Co., $5,998.459.28; Anglo-Canadian Contractors Ltd., $7,895,121.66.

The Nicholas Transportation Co.'s s.s. I. W. Nicolas, which was wrecked near Alpena, Mich., during the storm on Nov. 9, and which was eventually salved and towed to Sarnia, has, after an examination by the underwriters, been condemned as a total wreck. The examination showed damage to over 190 plates, and the estimated cost for necessary repairs is $90,000, which is additional to the $50,000 spent in salving operations. Cargo to the value of $70,000 has been saved from the wreck.

The U. S. Lake Survey reports the levels of the Great Lakes, in feet above tidewater, for January, as follows,—Superior 602.38; Michigan and Huron 580.09; Erie 572.06; Ontario 245.60. Compared with the average January levels for the past ten years, Superior was 0.34 ft. above; Michigan and Huron 0.03 ft. above; Erie 0.32 ft. above, and Ontario 0.01 ft. above. It was anticipated that during February, Superior would fall 0.2 ft.; Michigan and Huron would remain stationary; Erie would fall 0.1 ft., and Ontario rise 0.1 ft.

Sir Robert Perks, one of the contractors interested in the proposed Georgian Bay Canal to connect the Georgian Bay with the St. Lawrence at Montreal, read a paper before the Royal Society of Arts, London, Eng., Feb. 3. He is reported to have stated that the traffic would be at least 18,000,000 tons annually, yielding $9,000,000 net, a return of 4½ per cent. on the capital, to which must be added £1 profit on every h.p. of electric current sold. He estimated the cost of construction to be within $150,000,000.

The Lakes Disaster Fund, which was created with a view to assisting those who were dependent on the crews who lost their lives in the Great Lakes disaster of Nov. 9, 1913, has been closed and amounts appropriated to those to be benefitted. The total of the fund was $110,834, and the scheme provides that $77,640 is to be divided amongst 45 persons in monthly instalments over five years; $2,300 is to be distributed amongst 10 persons immediately, and 10 cases are held for further investigation.

The dredging of the channel through the Telegraph Narrows in the Bay of Quinte, which was recently undertaken by the Public Works Department, has been completed to a depth of 14 ft. below the zero of the Toronto Harbor Master's gauge. The dredged channel is 165 ft. wide, and extends from a quarter of a mile eastward of Telegraph Island, for 2,350 ft. The minimum depth is 13.7 ft. at the west end and on the south side of the channel. The channel is marked by three black spar buoys on the south edge and three red ones on the north edge.

Following on the comments made by witnesses and others, in the recent inquests on the bodies of some of the victims of the Great Lakes disaster of Nov. 9, as to the lack of facilities at, and exposed condition of, Goderich harbor, representatives of the various councils and municipalities having connection with Goderich, waited upon the Dominion Government recently to urge that something be done to equip Goderich as a harbor of refuge for vessels during a storm, and that the necessary work be carried out as quickly as possible.

The Great Waterways Union of Canada, an organization having for its main object the improvement and full utilization of the Welland Canal route from the Great Lakes to the St. Lawrence, at a meeting in Berlin, Ont., Feb. 13, discussed the proposed international negotiations for the development of a deep waterway from the head of the lakes to the sea, and decided to send a deputation to the Government early in April, to express appreciation for the action taken in regard to the projected Welland Ship Canal, and to urge the necessity of a corresponding increase in the capacity of the St. Lawrence and other canals.

Manitoba, Saskatchewan and Alberta.

Press reports from Prince Albert, Sask., state that a proposition will be placed before the local Board of Trade for the building of an up to date passenger steamboat by an Edmonton firm, to ply between Edmonton and Prince Albert. The intention is to build the vessel in Prince Albert, and the Prince Albert Board of Trade is to be asked to purchase 200 round trip tickets at $28.50 each, to help the venture.

British Columbia and Pacific Coast Marine.

The British steam yacht Santa Maria has been purchased by Vancouver parties, and was announced to sail from England in February for service on a local route.

Newport, which it is reported has been selected as the Pacific terminal of the Pacific Great Eastern Ry., is to have its name changed to Squamish.

The Minister of Public Works stated in the House of Commons, Feb. 16, that no site had been acquired for the projected dry dock to be built at Esquimalt.

R. H. Nicholson, of Esquimalt, is reported to have been appointed assistant fog alarm engineer, a new position, under the Marine Department, reporting to the chief engineer, W. H. Peters.

The Pacific Steamship Co.'s s.s. Tiverton commenced a regular service between Tacoma, Wash., and Vancouver, B.C., Feb. 14, calling at Seattle, Anacortes, Bellingham, Everett and Victoria.

The Dominion Marine Department is calling for tenders for the construction of a creosoted pile wharf at Victoria, on the Songhees Indian Reserve, where the new departmental depot is to be established.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince George, which has been overhauled and repaired at Esquimalt, was replaced on her route Feb. 1, when the s.s. Prince Rupert was taken out of service for similar overhaul and repair.

The Dominion Government light and buoy steamship Estevan, which has been in continuous service since she arrived on the coast from Collingwood, Ont., last year, is to have a thorough overhauling, as also is the lighthouse tender Quadra.

The Union Steamship Co. is reported to have placed contracts in Great Britain, or Ireland, for the building of two additional steamships for its Pacific coast service, and it is said they will be ready for service

at the end of the year, or early in 1915.

A quantity of structural steel, lumber and machinery has been assembled at Prince Rupert, in preparation for the construction of the Grand Trunk Pacific Dry Dock Co.'s dry dock and ship repair plant there, which, it is stated, will commence immediately.

The Islands Transport and Trading Co., Ltd., has been incorporated under the British Columbia Companies Act, with $100,000 capital and office at Victoria, to take over the business of the East Coast Transport Co., and to carry on a general trading and transportation business.

The C.P.R. s.s. Princess Mary, on which considerable overhauling and repair work is being done at Esquimalt, is also being lengthened 40 ft., thus making her 240 ft. long. She was built at Paisley, Scotland, in 1910. It is anticipated that she will be ready for service during March.

The master of a schooner, which recently arrived at Vancouver, from Japan, has been fined $450 and costs for a breach of the immigration regulations, in allowing three of his Japanese crew to land and escape. The steward was fined $150 for aiding and abetting. It was claimed in the evidence that the three men were not entered in the ship's articles.

The contract for the harvor improvement works at Victoria is reported to have been awarded to Hon. Angus McDonnell, who has been conducting a contracting business on the Pacific coast for some time. He carried out some railway contracts in British Columbia in conjunction with Grant Smith and Co., under the name of Grant Smith and McDonnell.

On instructions from the U. S. Attorney General, charges were laid at Juneau, Alaska, Feb. 5, against a number of steamship companies operating on the Pacific coast, including the C.P.R., and the White Pass and Yukon Route, for alleged violation of the anti-trust law in discriminating against the Humboldt Steamship Co., in connection with business at Skagway.

The first vessel intended for the ocean going trade, to be built on the Fraser or Pitt Rivers, was launched at Coquitlam, Jan. 31. She is a three masted schooner, with auxiliary engines burning oil, and is intended for trade between British Columbia ports and the West Indies by way of the Panama Canal. She is 215 ft. long by 40 ft. beam, and has been named City of Coquitlam.

The British Columbia Minister of Works promised a deputation recently that he would take up the question of providing a suitable ferry steamboat to take the place of the existing one, at the crossing of the Fraser River between Slough and Ladner. The present vesel is inadequate for the service and a larger one with capacity for about 20 teams will probably be built in the near future.

The British Columbia Marine Railway Co.'s plant at Esquimalt has been acquired by A. F. Yarrow and Son, of Scotland, and will, it is announced, be operated under the name of Yarrows Limited. The plant comprises 8 acres of land, marine railway, docks, shipbuilding and repairing plant, etc., and it is stated that considerable extensions are being planned for the near future, in view of the possibility of the construction of naval vessels under the Dominion Government.

The C.P.R. s.s. Princess Sophia, which ran ashore in Blenkinsop Bay, near Port Harvey, at the end of January, on her way down from Alaska ports, is being repaired at Victoria. The work covers the removing and replacing of from 15 to 18 plates on the starboard bow, and the straightening of a number of frames. It is expected that she will be ready to resume her service early in March. In the meantime her place has been taken by the s.s. Princess Maquinna.

The Vancouver Shipmasters' Association has called the Marine Department's attention to the fact that so called fishing vessels are being used for other than fishing work, such as for towing purposes, and for carrying passengers and cargo. This complaint applies to Vancouver and Prince Rupert, and is attributed to lack of inspectors on the coast. It was pointed out that there is only one inspector of hulls for the province, which is not sufficient for the proper carrying out of the work.

The Union Steamship Co.'s s.s. Vadso struck a rock near Stewart, during a snow storm, Feb. 3, and became a total loss. The vessel was built at Gothenburg, Sweden, in 1881, and was acquired by the Union Steamship Co., when it took over the Boscowitz Steamship Co., about two years ago. She was screw driven by engine of 110 n.h.p. Her dimensions were—length 191.2 ft., breadth 28.7 ft., depth 21.7 ft.; tonnage, 908 gross, 698 register. It is stated that the company has practically decided to replace the Vadso with a larger and more up to date vessel.

The names of the following navigation companies registered in British Columbia have been struck off the companies register:—Burrard Steamship Co., Comet Transportation Co., Horsefly Trading and Transportation Co., Malahat Tug Co., Michigan Towing Co., Progressive Steamboat Co., Sechelt Steamship Co., Sidney and Nanaimo Transportation Co., Terminal Steamship Co., Torpedo Freighting and Tug Co., Vancouver Steamship Co., Victoria and Vancouver Stevedoring and Contracting Co., Victoria Dock Co., Canadian Arctic Whaling Co., Fort George Timber and Transportation Co., Imperial Fisheries, Kyax Navigation Co., Pacific Towing and Contracting Co., Vancouver Quesnell Navigation Co.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

24. Jan. 26. Quebec, River St. Lawrence, Lake St. Francis, change in position of gas buoys.

25. Jan. 26. Quebec, River St. Lawrence Lake St. Francis, McKie Point, light discontinued.

26. Jan. 26. Ontario, Lake Erie, Port Stanley, dredging.

27. Jan. 26. Ontario, Lake Erie, Rondeau, dredging.

28. Jan. 26. Ontario, Lake Huron, Goderich, intended change in character of main light.

29. Jan. 28. Prince Edward Island, northwest coast, North Point, change in character of light.

30. Jan. 28. Quebec, Chaleur Bay, Cascapedia Bay, New Richmond, Duthie Point, light discontinued.

31. Jan. 28. Quebec, River St. Lawrence below Quebec, Longue Pointe, conical buoy replaced by gas buoy.

32. Jan. 28. England, south coast, Plymouth Sound, sunken obstruction to be placed.

33. Jan. 29. New Brunswick, Miramichi River, southwest branch, Clousten Bar range lights established.

34. Jan. 29. Nova Scotia, Margaretville, Wedgeport, Barrington, Pearl Island, Country Island, names.

35. Jan. 29. Nova Scotia, d'Escousse, Port Morien, Port Hood Island, Havre, Bouche, names.

36. Jan. 31. Ontario, Bay of Quinte, Telegraph Narrows, dredging, buoyage.

37. Jan. 31. United States of America, Lake Ontario, east end, Charity Shoal buoy to be moved and changed.

38. Jan. 31. Nova Scotia, Cape Breton Island, Little Bras d'Or, northern entrance, dredging.

39. Feb. 3. Nova Scotia, Bay of Fundy, entrance to Digby Gut, Point Prim, intended change in character of light.

40. Feb. 3. Nova Scotia, Bay of Fundy, Ile Haute, intended change in character of light.

41. Feb. 3. Nova Scotia, south coast, West Ironbound Island, intended change in character of light.

42. Feb. 3. Nova Scotia, Cape Breton Island, south coast, Guion Island, intended change in character of light.

43. Feb. 5. British Columbia, Vancouver Island, southeast coast, Esquimalt harbor entrance, Scroggs rocks, buoy established.

44. Feb. 5. British Columbia, Vancouver Island, southeast coast, Victoria harbor, westward of Shoal Point, buoy to be moved as work of widening harbor progresses.

45. Feb. 5. British Columbia, Strait of Georgia, Ballenas Islands, intended change in character of light.

46. Feb. 5. British Columbia, Malaspina Strait, Thormanby Islands, Tattenham Ledge, change in character of buoy.

47. Feb. 5. British Columbia, Chatham Sound, Port Simpson, off Alexander Point, buoy established.

48. Feb. 9. British Columbia, Queen Charlotte Islands, St. James Island, Cape St. James, lighthouse established.

49. Feb. 10. New Brunswick, south coast, Bay of Fundy, Dipper harbor, McLennan reef, buoy established.

50. Feb. 10. New Brunswick, south coast, Bay of Fundy, Chignecto channel, off Matthews Head, whistling buoy to be established.

51. Feb. 10. New Brunswick, east coast, Northumberland Strait, Richibucto Head, intended change in character of light.

52. Feb. 10. Quebec, River St. Lawrence, Channel patch, position of gas and bell buoy, correction.

53. Feb. 12. New Brunswick, south coast, Bay of Fundy, Barn Island ledge, spindle erected.

54. Feb. 12. New Brunswick, south coast, Bay of Fundy, Letite Passage, east of Parker Island, Splitting Knife ledge, spindle erected.

55. Feb. 12. Quebec, River St. Lawrence, Pointe des Monts, intended change in character of light.

56. Quebec, River St. Lawrence, Three Rivers, dredging.

57. Feb. 14. Nova Scotia, off Blonde Rock, and off Egg Island, submarine bell buoys to be established, off Cape Fourchu, northward of Chebucto Head, and Harbor Shoal, Louisburg harbor, electrically operated submarine fog bells to be replaced by submarine bell buoys.

58. Feb. 14. Quebec, River St. Lawrence, off Little Metis, submarine bell buoy to be established.

59. Feb. 18. Manitoba, Lake Winnipeg, Red River mouth, new channel, range lights established, old range lights discontinued.

60. Feb. 19. Ontario, Georgian Bay, Waubaushene, buoys, Matchedash Bay, Waubaushene to Fesserton, changes in buoyage.

61. Feb. 19. Ontario, Lake Superior, Cloud Bay, dredging. buoys.

62. Feb.. 19. British Columbia, off Cape Beale, Gossip shoals and Spanish bank, submarine bell buoys to be established.

63. Feb. 19. British Columbia, Vancouver Island, southeast coast, Victoria harbor entrance, Ogden Point, breakwater under construction, change in position of lights.

Recommendations as to Investigations into Casualties on the Great Lakes.

The following letter was sent to the Minister of Marine recently by L. Henderson, President of the Dominion Marine Association and Canadian Lake Protective Association, and A. E. Mathews and H. W. Richardson, First and Second Vice Presidents respectively, of the Dominion Marine Association:

The executive committees of the Dominion Marine Association and the Canadian Lake Protective Association, at a joint meeting in Toronto on Dec. 20, 1913, gave consideration to the Department's request for an expression of opinion regarding the finding of the Wreck Commissioner in the recent Turret Chief investigation, and at the same time revived a discussion which resulted some time ago in a recommendation for the appointment of a wreck commissioner with exclusive jurisdiction on the Great Lakes and other inland waters.

Dealing first with the larger question the meeting unanimously confirmed the opinion expressed in the previous recommendation to the effect that it is very desirable that the commissioner charged with the duty of investigating inland disasters should have from actual experience an intimate knowledge of the conditions on the Great Lakes, which differ so materially from those affecting ocean navigation, and as the office of commissioner has now been filled by a gentleman whose experience and training relate exclusively to ocean navigation, the committees mentioned unanimously resolved that the interests of all parties demand in all inland investigations at least the appointment of one or more assessors qualified by years of training to deal with questions quite beyond the experience of the court.

On behalf of the two associations named the undersigned accordingly ask that a capable master mariner of standing and having extensive knowledge of lake conditions and practice should sit as assessor in all investigations relating to navigation of the waters with which these associations are concerned. The committees recommend the appointment of Capt. J. B. Foote, of Toronto, as an assessor who should prove thoroughly qualified and acceptable to all parties.

The committees named considered Capt. Batten (who represented the inland point of view in the Turret Chief investigation) in all respects a most estimable man and skilled within the sphere of his activity, but they respectfully point out that his duties have for a long time confined his attention to the navigation of passenger steamers and for many years exclusively in the confined waters of the St. Lawrence between Prescott and Montreal.

Dealing particularly with the finding of the court in the Turret Chief investigation, the committees desired especially to point out that there does not appear to have been any evidence in support of the conclusion that the failure of the boat to head up into the sea was due to her being short handed in the stokehold. The uncontradicted evidence showed a good head of steam and that the oilers filled the place of the missing firemen satisfactorily. Attention is also called to the fact that one reason oilers are carried is to provide fully for just such contingencies as arose in this case. A vessel is frequently short of firemen, through no fault of the master, and the conditions and exigencies of the trade on the Great Lakes are such that any criticisms of a master for leaving port short handed in the stokehold do not appeal to the committee mentioned as quite justified or fair.

The committees are of the opinion that the storm in question in this case was of a most exceptional character and that as so many vessels were completely lost in it, and the master of the Turret Chief left port with no warning of its coming, a lenient view might well be taken of his conduct in circumstances which must have been extremely trying.

As to the specific recommendations at the conclusion of the finding, the committees concur that modern sounding devices are desirable, but do not approve of the suggestion for "an officially fixed light load line," for various reasons, chief among which are the following, namely, that it is better and safer to trust the discretion of the master of a lake freighter to take water ballast at the proper time, that in still weather the requirement proposed might unnecessarily hamper the movements and speed of the ship, that the prevailing custom of taking on ballast as required after leaving port or discharging ballast on approaching port—while carried out with good judgment—facilitates the progress of the vessel a very great deal, and that masters express an opinion against having water ballast in their ships unnecessarily or in still water. It is in fact claimed to be dangerous to retain water ballast in the hold in still waters, on account of its shifting nature. For these reasons the committees ask that this latter recommendation of the Wreck Commissioner be not adopted.

Dominion Government Customs Cruiser Margaret.

Launching of the Canadian Customs Cruiser Margaret.

The Canadian Customs cruiser Margaret, for patrol service on the Atlantic coast, was launched at Southampton, Eng., Jan. 14, the naming ceremony being performed by a granddaughter of the late Lord Strathcona, Mrs. J. B. Kitson, wife of Lieut. J. B. Kitson, R.N. The vessel took the water in an unusually advanced condition, both as regards hull and machinery, the accommodation, etc., as well as the propelling equipment, being practically complete. She was in fact almost ready for trial when floated. The keel was laid just early in Jan., 1913, and the ship has been built throughout under the inspection of F. L. Warren, M.I. N.A., M.I. Mech. E., of London.

The principal dimensions are as follows: Length overall, 200 ft.; length between perpendiculars, 185 ft.; breadth moulded, 32 ft.; depth moulded, 16 ft. The draught is limited to 10½ ft. when carrying a load of 175 tons. A ram stem and cruiser stern add to the appearance of the boat, which is a fine looking craft. A double bottom is fitted under the engines and the hold forward, and the hull is stiffened to resist ice, the propeller shafting being also housed in the hull for the whole of its length to prevent damage by ice. Watertight bulkheads divide the various compartments, and the bunkers are watertight also. Sliding watertight doors of the quick closing type are fitted to be worked from the upper deck. The bunkers have a capacity of 200 tons, giving a radius of action of nearly 2,000 miles at full speed, and about 4,000 miles at economical speed. The vessel is rigged as a fore and aft schooner, and has an outfit of boats consisting of a 30 ft. motor launch, a 26 ft. lifeboat, a 22 ft. captain's cutter, and a 16 ft. dinghy. For armament she will carry mounted on the forecastle deck two 6 por. quick firing guns of the latest improved type, with telescopic sights. She is fitted in a most up to date manner, carries a wireless telegraphy outfit, is electrically lighted, and has a 24 in. projector searchlight of 25,000 c.p. fitted in the crow's nest on the foremast. A refrigerating plant is installed, and a complete cold store below contains separate rooms for meat, vegetables and other provisions. She is heated by steam throughout.

The propelling machinery consists of two sets of vertical reciprocating engines running at 180 revolutions a minute, and having a combined i.h.p. of 2,000. The l.p.

cylinders exhaust each into a separate condenser, to which the circulating water is delivered by independent centrifugal pumps. A 15 ton evaporator is installed. Steam is supplied by two boilers of the watertube type. She has been built by John I. Thornycroft & Co., Ltd.

Express Companies' Statistics for 1913.

The annual summary of the business of the nine express companies operating in the Dominion, which has been laid before Parliament, shows that the operating mileage for 1913 was 32,557, compared with 30,445 in 1912, and a total capitalization of distinctly Canadian companies of $4,805,000.

Gross receipts from operation were $12,827,478, compared with $10,994,418 in 1912. Express privileges were returned at $5,708,408. This was the sum paid by express companies to railways and other carriers for the right to carry on business over their lines. Operating expenses were $5,743,544, against $4,880,120 in 1912. Net earnings of the following Canadian companies: Dominion, 38.8%; Canadian Northern, 21.3%; Canadian, 18.4%; and British American, 10.4%. The Dominion Ex. Co. paid a dividend of 10% on $7,000,000 common stock, and the Canadian Northern paid a dividend of $954,356.

Telegraph, Telephone and Cable Matters.

The Canadian Northern Telegraph Co. has opened an office at Neelin, Man., and has closed its office at Polwarth, Sask.

The Marconi Telegraph Co. has paid an interim dividend of 10% for 1913, on the 750,00 0ordinary shares.

A. E. Reoch, of the Marconi Wireless Telegraph Co. of Canada, addressed the Montreal Electrical Society on wireless telegraphy, Feb. 2.

The Great North Western Telegraph Co. has opened offices at Fonthill and Lyn, Ont., and Waterloo station Que., and has closed its office at Phillipsburg, Que.

The Canadian Northern Telegraph Co. has opened an office at Hafford, Sask., and has closed its offices at Berton, Ladysmith, Neelin, White Plains, Man., and Chandler and Fairlight, Sask.

The reports that W. Marconi's experiments in wireless telephony had reached such a stage that a full equipment was being installed on the Cunard Line's s.s. Aquitania, are officially stated to be incorrect.

The Great North Western Telegraph Co. has recently adopted the use of automatic machines in place of Morse operators for movement of business on the heavy trunk lines. On Jan. 14, a new type of Morkrum tape automatic printer was installed between Montreal and Toronto and has since been handling the volume of business between those points. The machine is operated by means of paper tape, which is prepared by girls working on an electrical perforator, the keyboard of which is similar to that of a typewriter. Instead, however, of a written message, the perforator delivers a strip of paper in which has been punched a number of holes. The tape is fed into the distributor at the sending office and the combination of holes causes levers to be operated, which in turn cause impulses to go over the line. These operate a special typewriter at the receiving point which writes out the message automatically. The machine is worked duplexed and is capable of handling as many as 120 messages in each direction per hour, or over 240 messages per hour on one wire. Better service in every respect is expected from the new system and it is the intention to extend its use to several other circuits in the near future.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

American Locomotive Co., New York, has issued bulletin 1,017 on locomotive ratios, by F. J. Cole, Chief Consulting Engineer.

The Brown Hoisting Machinery Co., Cleveland, Ohio, has issued pamphlet C. 1914, on Brownhoist safety crabs and winches.

Standard Underground Cable Co. of Canada, Ltd., Hamilton, Ont., has issued bulletin 710 C on indoor cable terminals, 32 pgs. with illustrations.

The Ohio Brass Co., Mansfield, Ohio, has issued an illustrated bulletin of 26 pgs., dealing with electric railway transmission and mine haulage materials.

The Hart-Otis Car Co., Ltd., Montreal, has issued pamphlet 17 describing and illustrating the H. O. ratchet hand brake for passenger and freight cars.

E. H. Hopkins & Co., railway and contractors' supplies, Montreal, have built a warehouse and opened an office in St. Catharines, Ont., in charge of C. V. Osborne, so as to be in the best possible position to handle the contractors' trade on the new Welland Ship Canal.

The Locomotive Superheater Co., 30 Church St., New York, N.Y., has issued the following: "Pyrometers for superheated steam locomotives" a circular, and "Instructions for installing, operating and maintaining pyrometers for superheater locomotives," also a pamphlet, "The use of highly superheated steam in marine practice."

The Orenstein-Arthur Koppel Company, of Koppel, Pa., has made Erich Joseph, General Manager, succeeding A. Reiche. Mr. Joseph was formerly New York manager. Mr. Reiche has severed his connection with the company to take up work with a German locomotive company.

National Steel Car Co.—G. Condon, Montreal representative, National Steel Car Co., Ltd., Hamilton, Ont., returned recently from England, where he arranged for the opening of offices for the company at 2 Norfolk St., Strand, London, with a view to handling export trade.

The Titanium Alloy Manufacturing Co., Niagara Falls, N. Y., has issued Rail Reports, Bulletin 4, Open Hearth, 32 pgs., 8½ by 11 ins., illustrated, among the most important features of which are tables summarizing the chemical and physical results of standard open hearth A. rails and Titanium treated open hearth A. rails.

H. J. Fuller, President, Canadian Fairbanks-Morse Co., Ltd., has been elected Vice President of Fairbanks-Morse Co., which has its headquarters in Chicago, and is now located in New York in charge of the eastern territory. He retains the Presidency of Canadian Fairbanks-Morse Co. and will be in Montreal frequently in connection with its business.

The Chicago Car Heating Company has opened a branch office and factory at 61 Dalhousie St., Montreal, to take care of its rapidly increasing business in the Dominion. A. D. Bruce, formerly its Purchasing Agent at Chicago, who is in charge, is a native of Guelph, Ont., and has been connected with the company for the past five years.

A. O. Norton Limited, has been incorporated under the Dominion Companies Act, with an authorized capital of $250,000 and office at Coaticooke, Que., to manufacture jacks. It will take over the Canadian business heretofore carried on under the name of A. O. Norton Incorporated. The officers are the same as in the old company, viz.—A. O. Norton, President; Harry A. Norton, Vice President and Treasurer; J. O. St. Pierre, Manager. There will be no change in the company's personnel or policy. Machinery to replace that destroyed by fire recently is being installed in the new plant and shipments of jacks are being made promptly.

Transportation Conventions in 1914.

March 17-20.—American Railway Engineering Association, Chicago, Ill.
April 21.—American Association of Freight Agents, Houston, Tex.
May —.—American Railway Claim Agents, St. Paul, Minn.
May 18-22.—International Railway Fuel Association, Chicago, Ill.
May 19.—American Association of Demurrage Officers, St. Louis, Mo.
May 20-22.—Freight Claim Association, Galveston, Texas.
May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
May 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.
May 26-29.—Master Boiler Makers' Association, Philadelphia, Pa.
May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
June 10-12.—Master Car Builders' Association, Atlantic City, N.J.
June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 16.—Train Despatchers' Association of America, Jacksonville, Fla.
June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.
July.—International Railway General Foremen's Association, Chicago, Ill.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly (acting), 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association. M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, J. S. Blanchet, Quebec.
Ship Masters' Association of Canada, Capt. E. Wells, 45 John St., Halifax, N.S.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Winnipeg Electric Railway Company

Annual Report for Fiscal Year ended December 31, 1913

Directors:

Sir Wm. Mackenzie, President; Sir Wm. Whyte, Vice-President; F. Morton Morse, Secretary-Treasurer; Sir W. C. Van Horne, Sir D. D. Mann, D. B. Hanna, A. M. Nanton, Hugh Sutherland, R. J. Mackenzie; Manager, Wilford Phillips.

Report of President and Directors.

To the Shareholders:—

Your directors beg to submit a statement of the past year's business, showing gross earnings of $4,078,694.75, as compared with $3,765,384.06 last year.

After providing for the percentage on earnings accrued to the city and interest on bonds, your directors declared four quarterly dividends, amounting to $1,070,043.18, leaving a surplus of $185,461.62, which has been transferred to the credit of Profit and Loss Account, making a total credit to this account to Dec. 31st, 1913, of $2,276,697.99.

From this amount the sum of $1,000,000 has been transferred to the credit of Reserve Account, and $375,000 to the credit of Suspense Account, leaving a balance of $901,697.99 carried forward in Profit and Loss Account to next year.

All the properties of the company have been efficiently maintained.

In accordance with the plan of extensions adopted at the last annual meeting, the following improvements and additions to the company's equipment and system have been made in the various departments.

ROADBED AND TRACK.—18.147 miles of track have been laid as follows: 8.06 miles with 80-lb. rails with concrete foundation and asphalt pavement; 9.341 miles of surface track with gravel ballast; which includes a new line to the Manitoba Government's new Agricultural College, in the Municipality of St. Vital.

ROLLING STOCK.—40 large double truck closed motor cars, 45 feet long with wide vestibules equipped with air brakes and all other modern appliances to insure the comfort and safety of passengers and trainmen, were constructed in the Company's Winnipeg shops and put in service.

ELECTRIC LIGHTING AND POWER DISTRIBUTION SYSTEM.—In extension of the company's electric lighting and power distribution system, there were erected 2,123 additional poles and 395,070 lbs. of wire, in addition to which the company has put down 386,312 duct feet of underground ducts and installed therein 114,440 feet of underground cable leading from the Company's Mill Street sub-station along Portage Avenue in the central part of the city to take the place of a large amount of overhead wire.

GAS DISTRIBUTION SYSTEM.—During the year 1913, the company has put down 85,780 feet of gas mains on the streets of Winnipeg in extension of its gas distribution system, and has laid 1,263 new gas services to private residences and other buildings, using therefor 70,292 feet of gas service pipe, and have installed 3,239 additional gas meters.

CONSTRUCTED.—A brick and reinforced concrete with concrete foundation sub-station erected at Transcona, two stories, with concrete roof, together with boiler room and heating apparatus. Installed in this building are 6,000 k.w.'s in transformers, and switching apparatus with available floor space for two motor generator sets.

A brick and reinforced concrete addition to the Mill Street sub-station, 40 by 60 ft., two stories, with concrete roof and concrete foundation, and installed in this building 6,000 k.w.'s in transformers and switching apparatus.

A four storey reinforced concrete fireproof building erected on Assiniboine Avenue, to be used for the storage of gas stoves and gas appliances, and as an electric and gas meter repair and testing shop, with space provided for the use of the Dominion Government in testing meters. The ground floor is used as a garage for gasoline tower and service wagons and there for charging electric automobiles and cartage trucks for the public.

Adjoining the company's Mill Street sub-station, the company have constructed a brick storage battery house, 41 by 194 feet, in which has been installed a 6,000 ampere hour storage battery, for storing electric current when the demand is light, to be used during the time the demand is heavy, and also as a protection against any interruption that may occur at the generating plants or the transmission line. This plant, when charged, is capable of taking care of the company's railway system in the central part of the city for a considerable time without assistance from the generating plants.

A re-inforced concrete sub-station constructed at the Canada Cement Works, South Winnipeg, and installed 4,200 k. w. transformers with the necessary switching apparatus.

A 22,000 volt transmission line constructed from the Canada Cement Co.'s plant to the new Agricultural College in the Municipality of Fort Garry, a distance of 6.1 miles from the Cement Works, and 1,500 k.w. transformers installed at the new college.

NEW OFFICE BUILDING.—The company's new ten-storey fire-proof Office Building, which was commenced in June, 1912, is now completed and occupied, and is the most modern and up-to-date fire-proof office building in Canada; the Company occupying the basement and the first two floors, the balance of the building being rented for offices.

Among the large contracts closed by the company during the year 1913 are the following:

With the Manitoba Government for lighting and electric power at the new Agricultural College Farm and College buildings.

With the Canada Cement Company for electric power for their new manufacturing plant at West Winnipeg, which has a capacity of 4,000 barrels of cement per day.

With the Canadian Pacific Railway Company for electric lighting and electric power for their new shops and roundhouses at North Transcona.

During the year 1913 your directors have been granted franchises and have made contracts for new railway lines in the Municipalities of St. Vital and Fort Garry, which are adjacent to Winnipeg, and for electric lighting and power privileges in the Municipality of St. Vital, and in addition, have made contracts for street lighting in the Municipalities of Assiniboia and St. Vital.

WM. MACKENZIE, President.

WINNIPEG ELECTRIC RAILWAY CO. STATISTICAL STATEMENT.

Years 1909-1913.

	1913.	1912.	1911.	1910.	1909.
Gross receipts	$4,078,694 75	$3,765,384 06	$3,829,749 67	$3,284,341 83	$2,623,731 41
Increase 1913 over 1912—8.32%	313,310 69				
Operating expenses	2,252,606 77	2,004,147 92	1,900,967 67	1,654,833 60	1,320,665 09
Increase 1913 over 1912—12.40%	248,458 85				
Operating expenses per cent. of earnings	55.23	53.23	49.64	50.39	50.34
Net earnings	1,826,087 98	1,761,236 14	1,928,782 00	1,629,508 23	1,303,066 32
Increase 1913 over 1912—3.68%	64,851 84				
Net income per cent. of capital	14.27	16.75	18.51	14.39	13.14
1913—8,795,907 average 1912—7,131,047 average 1911—6,000,000 1910—6,000,000 1909—6,000,000					
Passengers carried	59,563,757	51,106,017	40,281,245	31,369,421	26,382,773
Increase 1913 over 1912	8,457,740				
Transfer	15,039,016	11,858,213	10,012,084	8,003,038	8,925,849
Railway earnings per capita.	14.64	13.58	10 46	10.02	10.03

Correct, F. MORTON MORSE, Secretary-Treasurer.

Auditors' Report.

To the President and Shareholders, Winnipeg Electric Railway Company, Winnipeg.

Gentlemen:—

We beg to report that we have audited the books and accounts of your company

Winnipeg Electric Railway Company (continued)

and of its subsidiary companies, viz.: Winnipeg, Selkirk and Lake Winnipeg Railway Company, and the Suburban Rapid Transit Company, for the year ended 31st December, 1913.

All receipts have been duly checked and all expenditures properly vouched and all our requirements as auditors have been complied with.

We have examined the accompanying statements, viz.: Balance Sheet, Revenue and Expenditure Account, Profit and Loss Account, Capital Account of the Winnipeg Electric Railway Company, and Balance Sheet, Revenue and Expenditure Account, Profit and Loss Account of the Suburban Rapid Transit Company, and of the Winnipeg, Selkirk and Lake Winnipeg Railway Co., and in our opinion, a true and correct view of the Companies' affairs is exhibited thereby, according to the best of our information and as shown by the books of the Companies.

W. A. HENDERSON & CO.,
Chartered Accountants.

Winnipeg, February 9, 1914.

Winnipeg Electric Ry. Co., Financial Statement for Year Ending December 31, 1913.

ASSETS.

Cost of property:—		
Street railway, buildings, plant and equipment		
Electric lighting, plant and equipment		
Electric power, plant and equipment		
Gas, buildings, plant and equipment		$20,271,495 33
Stores		313,999 78
Accounts receivable		333,650 04
Cash on hand in office		16,149 54
Conductors' working fund		12,392 85
Subsidiary companies		832,018 92
		$21,779,706 46

LIABILITIES.

Capital stock		$9,000,000 00
Bonds, 5% payable 1st Jan., 19-7....	$1,000,000 00	
Bonds, 5% payable 1st Jan., 1935	4,000,000 00	
		5,000,000 00
Debenture stock, 4½% Perpetual..	£700,000 00	3,404,602 62
Accounts payable...	473,903 66	
Dividend paid 2nd Jan., 1914	270,000 00	
Wages for December	55,849 45	
		799,753 11
Accrued interest on debenture stock ..		34,146 98
Car license due 1st Feb., 1914	6,060 00	
City percentage due 1st Feb., 1914 ...	119,228 96	
		125,288 96
Bank of Montreal		1,106,159 92
Unredeemed tickets		8,540 44
		19,478,492 03
Suspense		399,516 44
Reserve		1,000,000 00
		$20,878,008 47
Surplus as per profit and loss account		901,697 99
		$21,779,706 46

CONTINGENT LIABILITY.

Suburban Rapid Transit Co.'s bonds	$500,000 00
Winnipeg, Selkirk & Lake Winnipeg Railway Co.'s bonds	400,000 00
	$900,000 00

Interest and principal guaranteed.

Winnipeg, Selkirk and Lake Winnipeg Railway.

Directors: F. Morton Morse, President; D. H. Laird, Pice-President; Sir Wm. Whyte, A. M. Nanton, J. H. Munson, L. J. Loader, Hugh Sutherland; Manager, Wilford Phillips; Secretary, G. A. Henson.

FINANCIAL STATEMENT FOR YEAR ENDING 31st DECEMBER, 1913.

Assets.

Cost of property		$1,330,689 85
Stores		2,864 21
Cash—Bank of Montreal	$1,136 30	
Cash on hand	878 38	
		2,014 68
Agents' balance:—		
Winnipeg	216 55	
Selkirk	62 00	
		278 55
Accounts Receivable		1,713 86
		$1,337,561 15

Liabilities.

Capital stock	$111,500 00
Bonds	400,000 00
Accounts payable	716,941 73
Suspense	60,913 72
	$1,289,355 45
Surplus as per profit and loss account	48,205 70
	$1,337,561 15

Interest and bonds guaranteed by Winnipeg Electric Railway Company.

Correct, G. A. HENSON, Secretary-Treasurer.

Certified correct, W. A. HENDERSON & CO., Chartered Accountants.

REVENUE AND EXPENDITURE.

Gross earnings for year.	$129,317 42	
Gross expenses for year.	65,943 67	
Net earnings for year...		$63,375 75
Fixed charges:—		
Interest on bonds.....	$20,000 00	
Taxes, etc.	32,077 01	
		52,077 01
Surplus for year		$11,296 74

PROFIT AND LOSS ACCOUNT.

Balance at credit 31st December, 1912	$36,908 96
Net earnings as per revenue account	11,296 74
Balance at credit 31st December, 1913	$48,205 70

Suburban Rapid Transit Company.

Directors: A. M. Nanton, President; F. Morton Morse, Secretary; Sir Wm. Whyte, D. B. Hanna, Hugh Sutherland; Manager, Wilford Phillips.

Financial Statement for Year Ending 31st December, 1913.

ASSETS.

Cost of property		$514,977 71
Cash—Bank of Montreal.	$9,916 27	
Cash on hand	275 22	
		10,191 49
Winnipeg Electric Railway Company loan		75,180 09
Accounts receivable		4,988 94
		$605,338 23
Balance as per profit and loss account		67,171 12
		$672,509 35

LIABILITIES.

Capital stock	$100,000 00
Bonds	500,000 00
Accounts payable	69,080 62
Ticket account	217 94
Suspense	3,210 79
	$672,509 35

Bonds and interest guaranteed by Winnipeg Electric Railway Company.

Correct, F. MORTON MORSE, Secretary-Treasurer.

Certified correct, W. A. HENDERSON & CO., Chartered Accountants.

REVENUE AND EXPENDITURE.

Gross earnings for year .	$65,956 31	
Gross expenses for year .	62,790 36	
Net earnings for year ..		$ 3,165 95
Fixed charges:		
Interest on bonds	$25,000 00	
Taxes, etc.	1,967 77	
		26,967 77
Deficit for year		$23,801 82

PROFIT AND LOSS ACCOUNT.

Balance at debit 31st December, 1912	$43,369 30
Deficit for year	23,801 82
Balance at debit 31st December, 1913	$67,171 12
Gross earnings for year	$4,078,694 75
Gross expenses for year	2,252,606 77
Net earnings for year	$1,826,087 98
Fixed charges	570,583 18
Dividends	1,070,043 18
	1,640,626 36
Surplus for year	$185,461 62

PROFIT AND LOSS ACCOUNT.

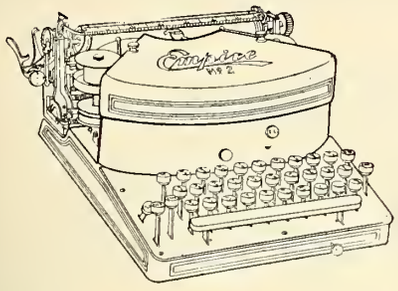
Balance at credit 31st December, 1912		$2,091,236 37
Surplus as per revenue account ...		185,461 62
		$2,276,697 99
Less transferred to reserve account ...	$1,000,000 00	
Less transferred to suspense account .	375,000 00	
		1,375,000 00
Balance at credit 31st December, 1913		$901,697 99

CAPITAL STOCK.

Authorized capital stock	$10,000,000 00
Subscribed and paid in	9,000,000 00

Correct, F. MORTON MORSE, Secretary.

Certified correct, W. A. HENDERSON & CO., Chartered Accountants.



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Built on Honour for a Lifelong Service by Canadians in Canada.

$60.00 **$80.00**

The Williams Manufacturing Co., Limited, Since 1868
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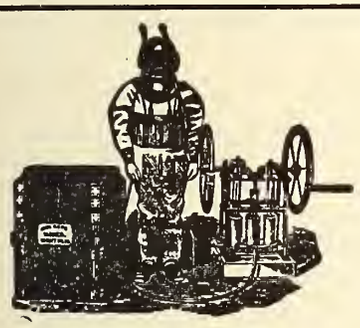
J-M ASBESTOS & MAGNESIA RAILROAD SUPPLIES

Roofings	Locomotive Lagging	Pipe Coverings	Electrical Supplies
Shingles	Air Brake Cylinder	Smoke Jacks	Overhead Line Material
Packings	Packing Expander Ring	Asbestos Wood	Rail Bonds and Tools
Gaskets	Underground Conduit	Fibre Conduit	"Noark" Fuse Devices
Hair Felt	Leak-No Metallic Compound	Insulation	Waterproofing Materials
Cements	Fire Extinguishers	Metal Polish	Fuse, Service and Subway Boxes, etc., etc.

Write Nearest Branch for Catalog No. 252.

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED
Toronto, Ont. London, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B.C



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Manufacturer of

Diving Apparatus

For Sale or Hire

Brass Founder and Coppersmith
13-15 Concord St., Montreal

MILLER HEATING SYSTEMS

For Roundhouses and Shop Buildings

Highest Efficiency on Least Possible Fuel Consumption.

F. W. MILLER HEATING CO.
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Idaho and British Columbia
Cedar, Fir and Tamarack

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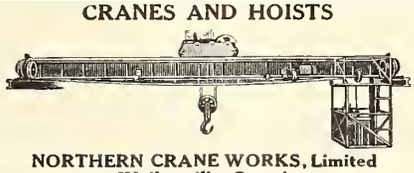


NORTHERN CRANE WORKS, Limited
Walkerville, Ontario

Car Closets

FLUSH OR DRY

DUNER CO. 101 S. CLINTON ST. CHICAGO

FOR SALE

One Wheelock Engine, manufactured by the Goldie McCullough Co., Belt Drive, High Pressure Cylinder 13 x 30 in., and Low Pressure 24 x 30 in. This Engine will develop 156 Horse Power, and is in first-class condition. Wish to dispose of same as we are using Hydro-Electric power. Will sell cheap.

GUELPH RADIAL RAILWAY COMPANY.

MAIL CONTRACT.

SEALED TENDERS, addressed to the Postmaster-General, will be received at Ottawa until Noon, on Friday, the 13th March, 1914, for the conveyance of His Majesty's Mails, on a proposed Contract for four years, six times per week each way, over Streetsville (via Huttonville and Churchville) Rural Mail Route from the Postmaster-General's pleasure.

Printed notices, containing further information as to conditions of proposed Contract, may be seen and blank forms of Tender may be obtained at the Post Offices of Streetsville, Huttonville, Churchville, and at the office of the Post Office Inspector, Toronto.

A. SUTHERLAND,
Post Office Inspector.

Post Office Inspector's Office,
Toronto, Jan. 23rd, 1914.

Canadian Pacific Railway Company.

Dividend Notice.

At a meeting of the Board of Directors held to-day the following dividends were declared:—

On the Preference Stock, two per cent. for the half-year ended 31st December last;

On the Common Stock, two and one-half per cent. for the quarter ended 31st December last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from Special Income Account;

Both dividends are payable 1st April next, to Shareholders of record at 1.00 p.m. on 28th February next.

By order of the Board,
W. R. BAKER,
Secretary.

Montreal, 9th February, 1914.

NOTICE is hereby given that the Annual Meeting of the Shareholders of the Victoria Rolling Stock and Realty Company of Ontario, Limited, will be held at the offices of Messrs. Osler and Hammond, 21 Jordan Street, Toronto, on Wednesday, March 4, 1914, at twelve o'clock noon, for the reception of the Annual Report and election of Directors for the ensuing year.

By order,
G. T. CHISHOLM,
Secretary.

Toronto, February 12, 1914.

Toronto Horse Car Days.—Among a number of witticisms attributed to the late Chief Justice Hagarty, of Ontario, by a contributor of the Toronto Mail, is the following:—"About 40 years ago the Toronto Ry. Co. was operating short cars, commonly called 'bob-tailed cars,' on Queen St., drawn by horses. The driver of the horse occupied the dual position of conductor and driver. A ratepayer, alleging danger from this mode of operation, sought an injunction to restrain the company and compel them to employ conductors. The case, coming before the witty Chief Justice, he asked the counsel representing the ratepayer if it were not a suit with reference to short forms of conveyances."

Snow Removal in Toronto. The Toronto Ry. having failed to comply with a notice from the City Works Commissioner to remove from the streets the snow which it swept from its tracks, the Corporation Counsel has been instructed to enter suit against the company.

Type V

Type VL

Type VA

Type VC

Type VX

Type VT

Save Money by Protecting Your Incandescent Lamps from Dampness, Gas and Fine Dust, as well as from Theft and Breakage

Condulets of the V Series Provide The Means

Each Condulet as sold includes Casting, Lamp Receptacle, Sealing Plate, Gaskets, Globe and Guard.

Castings are made with from 1 to 4 threaded hubs, as shown in illustrations, into which the conduit carrying the wires is screwed.

Parts are easily adjusted and will not work loose as result of knocks or vibration.

A padlock can be used with the Guard, thus preventing unauthorized removal of Guard, Globe or Lamp.

Condulets of V Series take any regular Mazda lamp up to and including 40 watt size or any incandescent lamp not exceeding $2\frac{3}{4}$x6 inches.

Larger than Condulets of V Series, but otherwise identical, are the Condulets of the VH Series. These Condulets take regular Mazda lamps no larger than the 100 watt size or other incandescent lamps not exceeding $3\frac{3}{4}$x$7\frac{3}{4}$ inches.

You Can't Lose and May Win by Mailing Attached Coupon Today

Crouse-Hinds Company of Canada, Ltd.

Main Office and Works:

Toronto, Ontario, Canada

Kindly send me Condulet Catalogue .....

Name .....

Street .....

City ..... Prov. .....

CRMW314

CANADIAN PACIFIC

WHEN YOU TRAVEL, TRAVEL IN COMFORT

The Canadian Pacific offers to the travelling Public, service and equipment second to none. They build, own, and operate their Compartment Observation Cars, Standard Sleepers, Dining Cars, Coaches and Motive Power.

The Canadian Pacific own and operate a line of palatial hotels along the Railway from Atlantic to Pacific, thus affording their patrons every possible comfort.

The Canadian Pacific can ticket you around the World, and enable you to travel over two-thirds of the World's journey on their own trains and steamers.

Those contemplating a trip will receive full details and literature from any C. P. R. Agent, or write,

M. G. MURPHY,
District Passenger Agent, Toronto, Ont.

The New Way of Handling Baggage, Mail, Express and Freight

One concern handling freight by the old method with 11 men and 5 hand trucks averaged 10 tons per hour, or 2 tons per truck per hour. The same gang reduced to 8 men and 2 electric trucks now have a daily average of 300 tons, or 15 tons per truck per hour. How is that for increased efficiency?

Another large railroad operating Elwell-Parker Electric Trucks has reduced the total cost per ton for freight handled to about ten cents. With hand trucks the average cost per ton to handle same tonnage under the same conditions was about thirty cents.

ELWELL-PARKER ELECTRIC TRUCKS

Equipped with Edison Storage Batteries have solved the problem in an economical way for handling freight at railway terminals, transfer stations, wharfs, docks and warehouses.

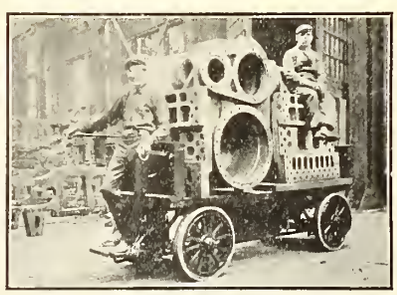
Whenever used they have shown an immense saving over the old system of hand trucks. Elwell-Parker Trucks are extremely easy of operation, in no way needing skilled labor, and by having a spare battery set can be worked overtime continuously without injury.

They are being used with great success by many of the leading railroads on the continent.

Let us send you operating costs taken from actual service records.

Ask Us for Bulletin 107.

SALES AGENTS:



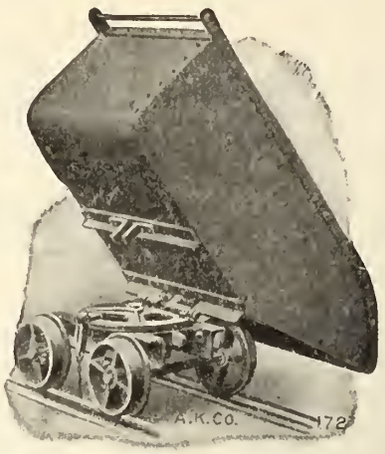
Straight Frame Baggage Truck with double end control.

Freight Car Truck.

The Canadian Fairbanks-Morse Company, Limited

ST. JOHN QUEBEC MONTREAL OTTAWA TORONTO WINNIPEG SASKATOON CALGARY VANCOUVER

Scoop All Around Dump Car



This car is especially designed for mines and for the conveyance of wet materials, such as concrete, mortar, wet sand, ashes, etc.

It is built without doors, and the discharging end is fashioned into the form of a scoop, which is an excellent construction for placing the load where it is desired, as the body is built on a swivel turntable.

This type of car is built for 12 to 18 cubic feet capacities and for 18, 20 and 24-inch gauges.

Orenstein-Arthur Koppel

Are manufacturers of Portable and Industrial Railways, Narrow Gauge Sidings, Turntables, Switches, Frogs, and Cars of all types and sizes. Let us send you their catalogue.

SALES AGENTS

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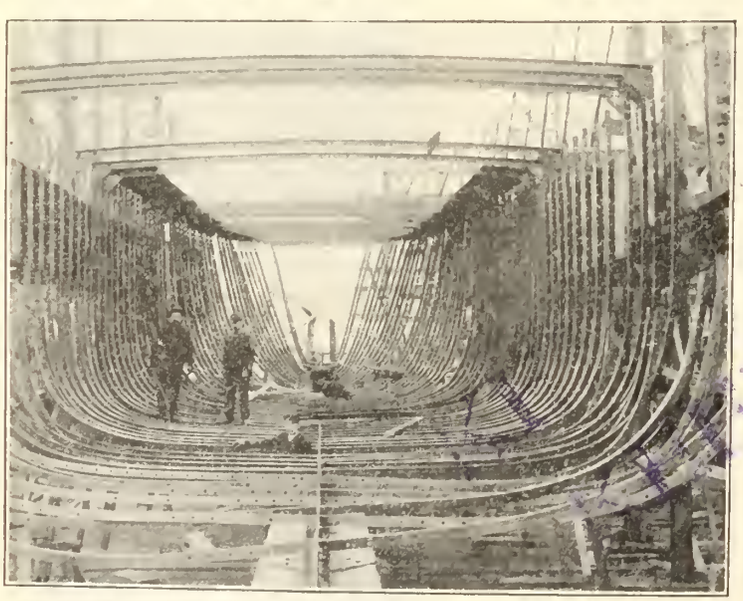
Winnipeg Saskatoon Calgary Vancouver

STEEL SHIPBUILDERS



Steel Frame of Steamer in Process of Erection.

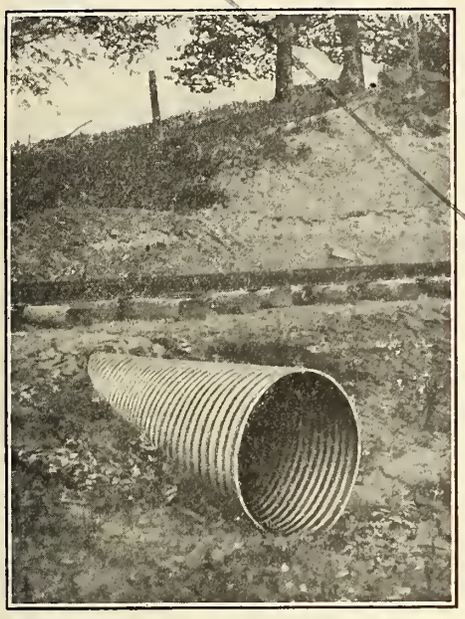
Engineers and Boilermakers

Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows

Marine Engines and Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto



Equally good whether under a 35 foot fill or right up against the railroad ties. (Shows installation on C. N. R. 6 inch covering.)

Pedlar's "Perfect" Culverts

Made of Anti-corrosive

TONCAN METAL

ALWAYS ON THE JOB

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Used exclusively by leading Canadian Railways.

Cast Iron Car Heater Fittings

We are largest manufacturers in Canada of this class of work

Ret. Bend, Side Outlet

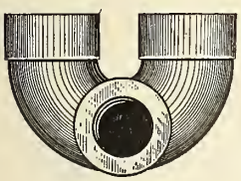

Fig. 933

R. & L. Coupling

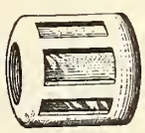

Fig. 932

Tee

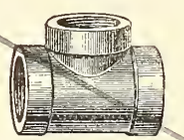

Fig. 927

Double Tee

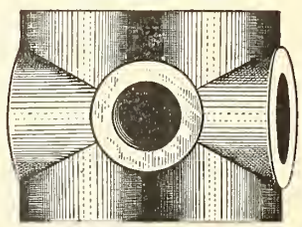

Fig. 930

Large Stock on Hand—Send Specification for Attractive Prices

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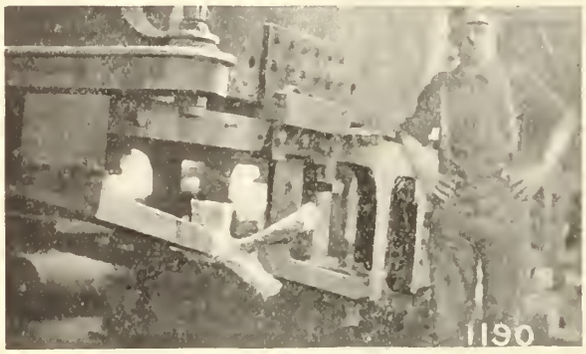

Finished Thermit Weld on Engine No. 802 of the Grand Trunk Pacific, Transcona, Man.

Frame Welded with Thermit by the Illinois Central, Centralia, Ill

Thermit Welding Will Save You from $25 to $250 on Every Frame Weld

Scarcely any dismantling is required where locomotive frames are welded with Thermit, as it is only necessary to provide room for the mold box around the parts to be welded together. It is common practice to complete a locomotive frame weld and return the engine to service in twelve hours or less.

The mechanical officials of 419 railroad shops in the United States, Canada and Mexico are using Thermit regularly and taking advantage of the very large saving which the Thermit process makes possible.

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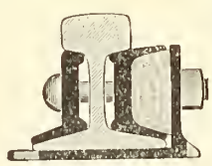

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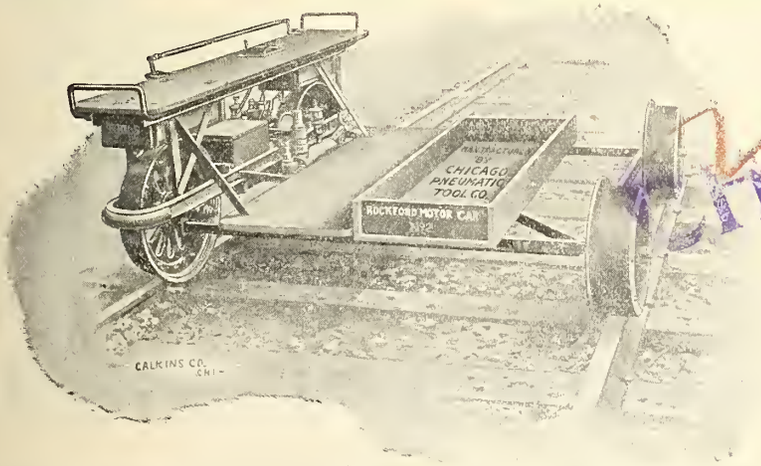

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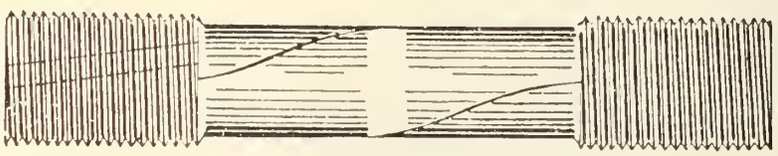

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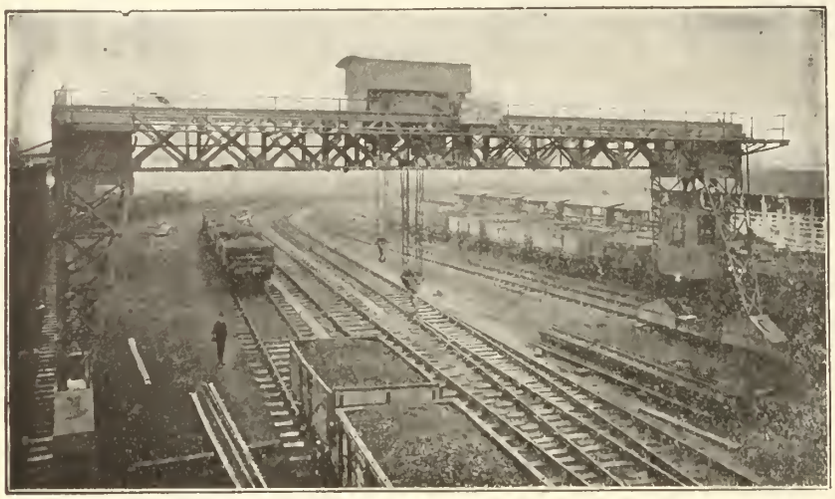

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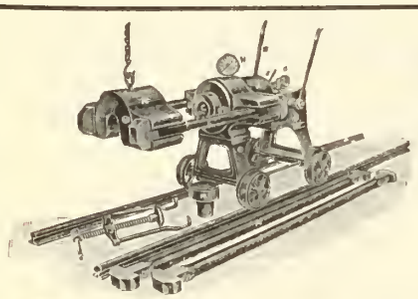

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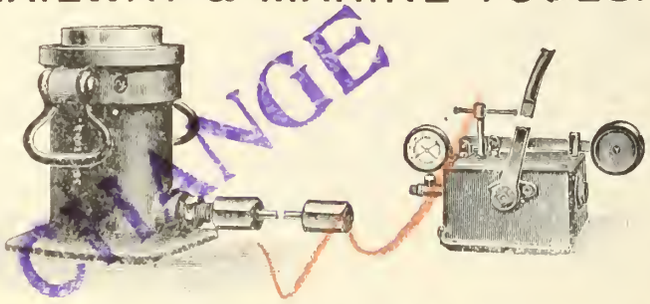

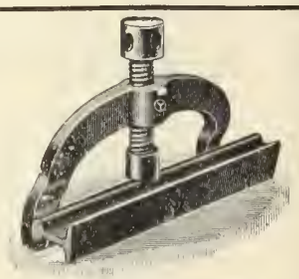

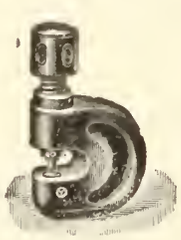

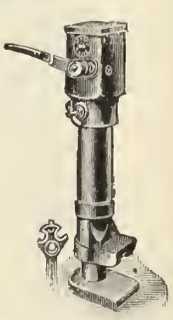

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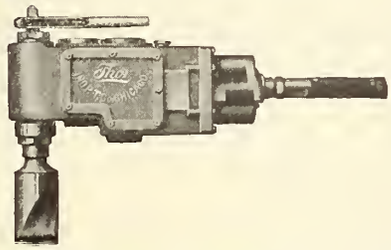

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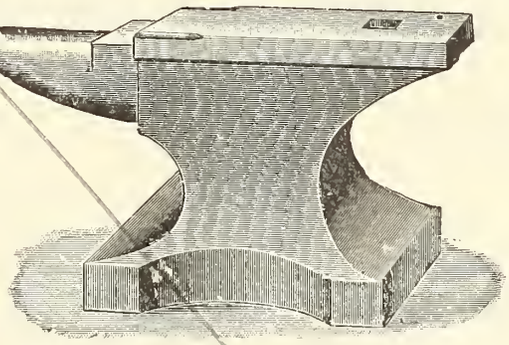

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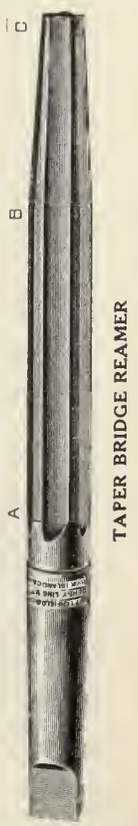

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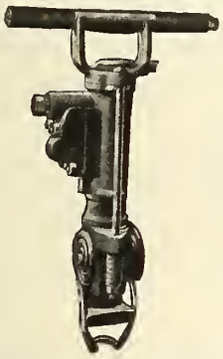
enables you to place your blast holes effectively—where they will do most good. This means that with a Jackhamer you can use less dynamite and get the same results.



It is an all-steel hand hammer drill with an automatic rotation and an automatic oiling device. It also has the non-freezing "Butterfly Valve", an efficient hole cleaning device and a handy steel-holder.

It reduces drilling costs for all down holes of medium depth.

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In 1913 more substantial gains than ever were registered all along the line.

New Policies in 1913 exceeded those for 1912 by nearly One Million Dollars.

Substantial increases in Assets and Net Surplus.

Policies in Force now over $52,000,000.

The swing of success is with the

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THE FIGURES TELL THE STORY:

	1913.	Increase Over 1912.
Policies in Force	$52,308,338	$2,838,757
Policies Issued	8,565,835	935,499
Policies Applied For	9,009,145	667,512
Assets	14,043,815	819,656
Net Surplus	1,781,117	205,071
Cash Income	2,563,116	158,359
Profits Paid to Policyholders	206,585	40,217
Total Payments to Policyholders	1,212,559	95,651

Profits Contingently Allotted to Policyholders for 1914—$241,475.

PROFITS PAID TO POLICYHOLDERS

in the past ten years aggregate $1,306,590. Of this amount the sum of $206,585 was paid to Policyholders in 1913.

A steadily-increasing earning power on investments, a favorable death rate and a management that skilfully combines progress with conservation are your guarantees that North American Life Policies will pay.

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Electric railways operating in this manner will find our portable box will meet all their requirements. It can be placed in a metal holder on the rail and easily carried to the opposite end of the car for the return trip. A portable box should be used in every car, whether a stationary box is used or not, for collecting fares from passengers who enter the body of the car without paying.

A number of roads using the P.A.Y.E. system load their cars at the end of the line without collecting fares on entry. When all fares are once collected, the car is then operated P.A.Y.E.

You can do this to advantage with the COLEMAN PORTABLE FARE BOX.

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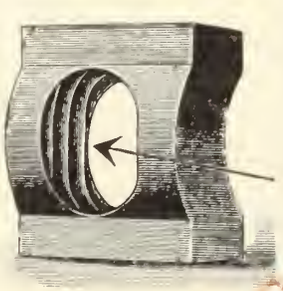

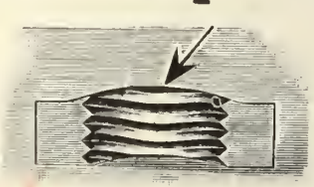

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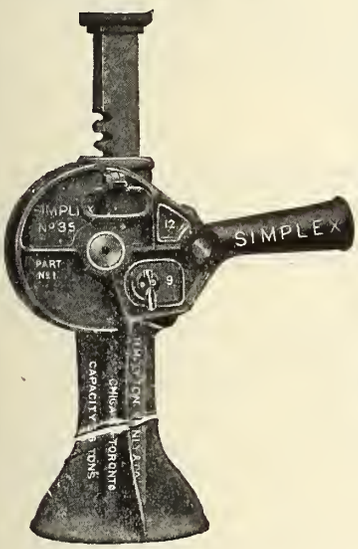

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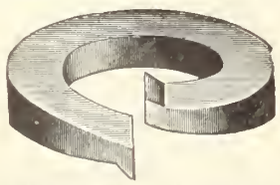

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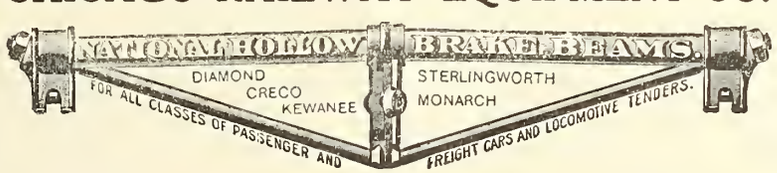

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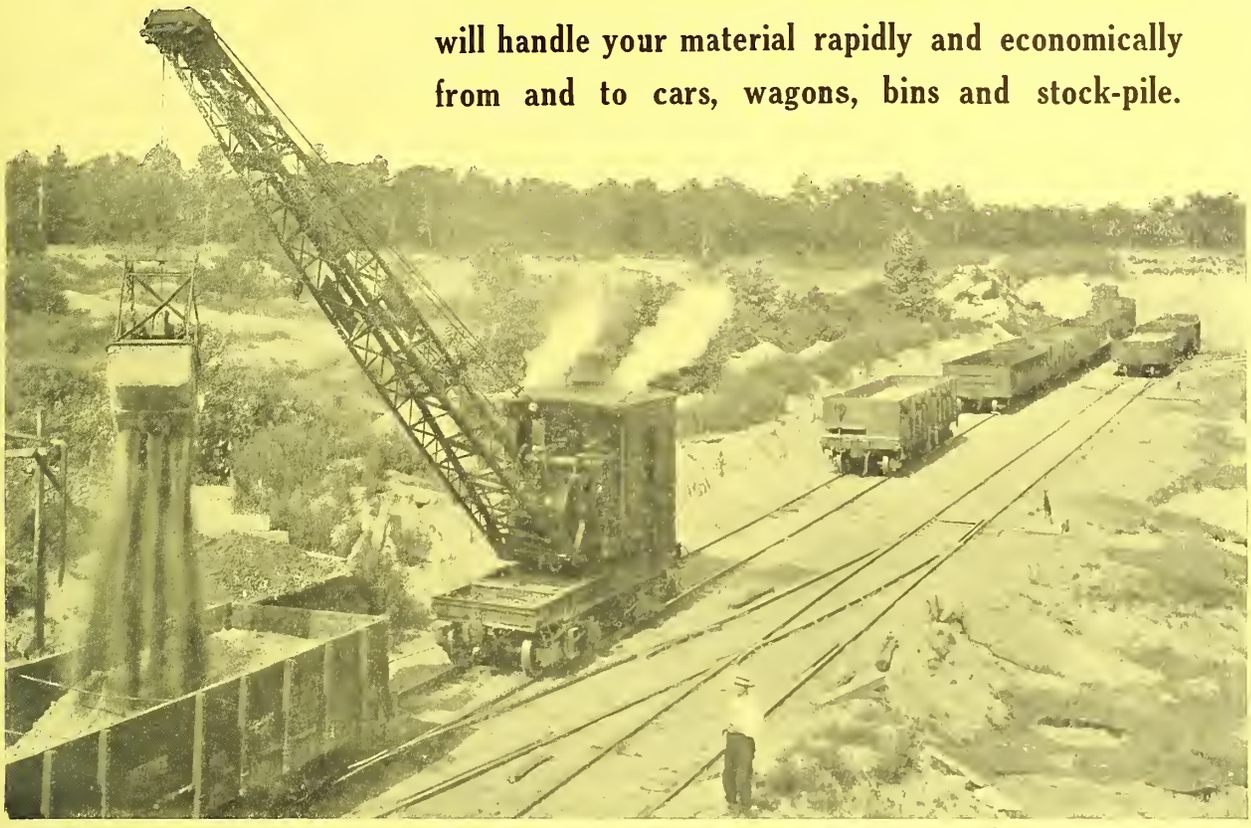
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO, U.S.A.

CANADIAN CAR
— AND —
FOUNDRY COMPANY
— LIMITED —
CAR BUILDERS

GENERAL OFFICES
TRANSPORTATION BUILDING
MONTREAL
BRANCH OFFICE —
TORONTO

WORKS
AMHERST, N.S.
TURCOT, MONTREAL
MONTREAL WEST, QUE.
FORT WILLIAM, ONT.

CANADIAN STEEL FOUNDRIES
LIMITED

STEEL CASTINGS – MANGANESE STEEL CASTINGS
COUPLERS - COIL AND ELLIPTIC SPRINGS
STEAM AND ELECTRIC RAILWAY TRACK WORK
BAR STEEL

GENERAL OFFICES
TRANSPORTATION B'LD'G
— MONTREAL
BRANCH OFFICE — TORONTO

WORKS
WELLAND, ONT.
POINT ST. CHARLES, MONTREAL
LONGUE POINTE, MONTREAL

Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 194 — TORONTO, CANADA, APRIL, 1914 — Subscription Rates Page 173

Steel Castings

for

Locomotives and Cars

Locomotive Frame, Length 40 ft., Weight 5 Tons
Carbon or Vanadium Cast Steel

Our cast steel specialties include Truck Bolsters, Twin Spring and Friction Draft Gear, M. C. B. Penn Couplers, Journal Boxes, and Draft Arms.

Quality and Service Guaranteed

Dominion Steel Foundry Co.

Limited

Hamilton, Canada

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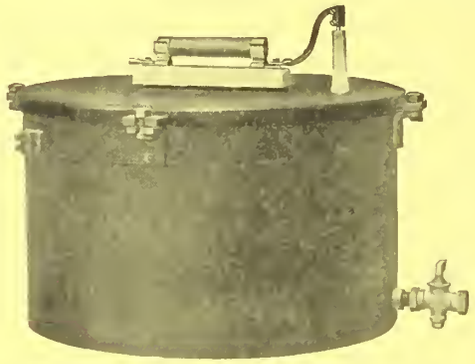
Westinghouse Protective Apparatus
For Electric Railway Service



Type A Electrolytic Arrester.

Type A Electrolytic Arrester

600 and 1,500 volts direct current for station use.

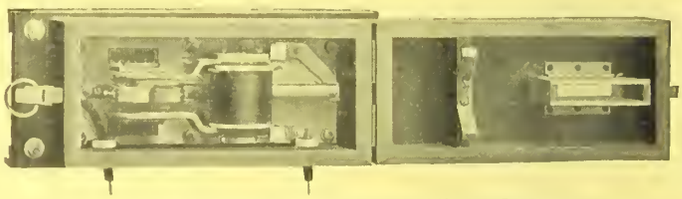
The elements are contained in strong iron tanks instead of fragile glass jars. Great freedom of discharge is obtained by use of the same large surface trays used in our alternating current electrolytic arresters. The large amount of oil surrounding the trays, combined with the large tray surface, allows for long continued or frequently repeated discharges without overheating.

Type B Arrester

For 1,500 volts direct current line use.

This arrester is of the well-known magnetic blowout type, with carborundum resistor in series with a spark gap. The design is larger and stronger than usual for this type of arrester, so as to take care of the extreme conditions encountered in direct current high-voltage service.

CHANGE



Type B Arrester, Bottom View, Open.

MP Arrester.

Type MP Lightning Arrester

400 to 700 volts Alternating or Direct Current
for Car, Line and Station use.

The working parts consist of a block of special composition over which the discharge spreads itself along a number of minute discharge paths. Owing to the large number of gaps the line voltage cannot maintain an arc across them. There are three different styles of MP arresters, one for car mounting, open wiring; one for car mounting, conduit wiring; and one for pole or station use; all with parts enclosed in substantial galvanized-iron boxes.

Type K Arrester.

Type K Arrester

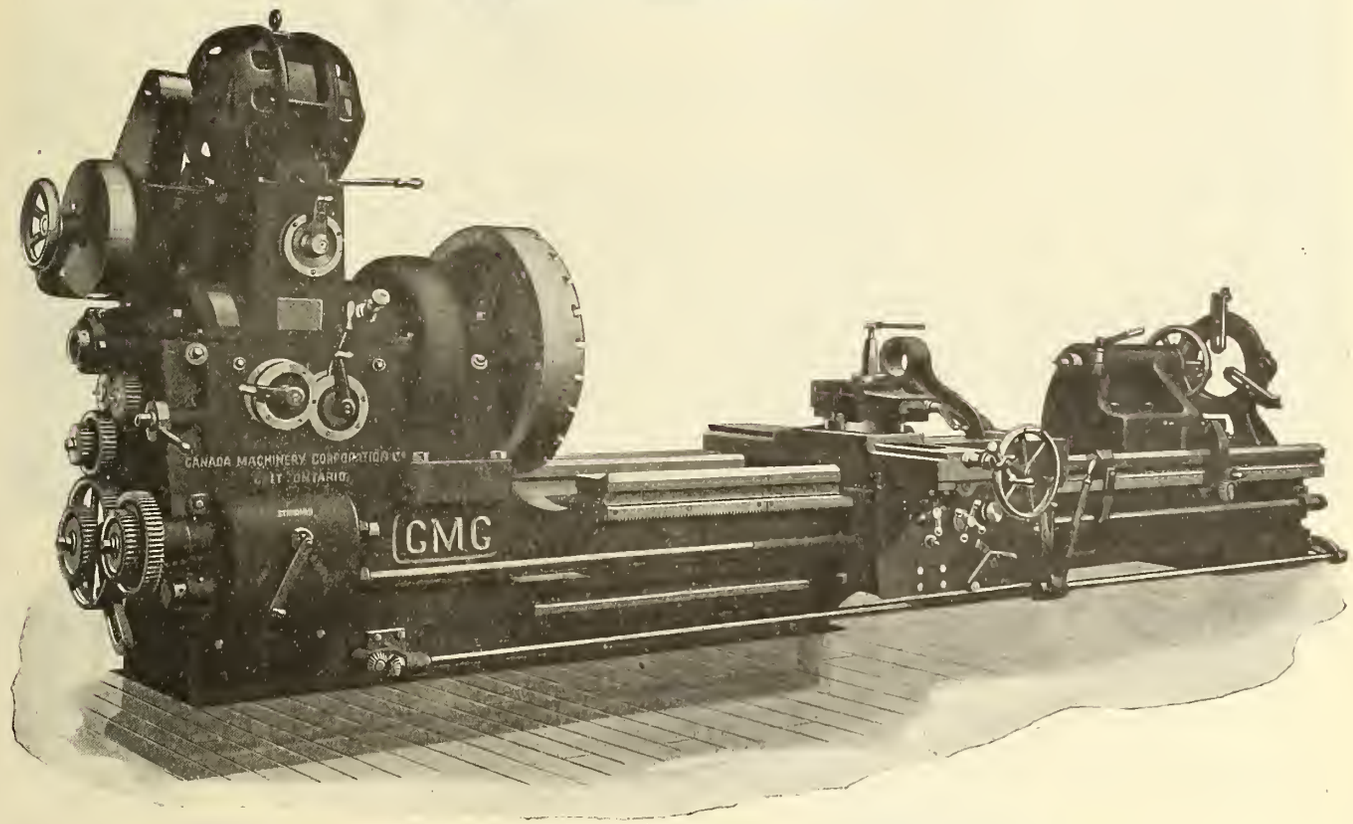
750 and 1,500 volts for Direct Current Car and Line Use.

This arrester is of the condenser type, with a spark gap to insulate the condenser from the line under normal conditions. The condenser is shunted by a high resistance, serving to keep it discharged so that its full capacity is always available. In operation the static charge bridges the spark gap and passes through the condenser, which acts practically as a short circuit to the high-frequency static disturbances. Type K arrester is equal in protection offered to an electrolytic form of arrester in first-class condition.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX	WINNIPEG	CALGARY	VANCOUVER
Traders Bank Building	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.	158 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

TRIPLE GEARED C.M.C. GAP LATHE



36" x 60" x 18' All Geared Motor Driven Gap Lathe

The design of the head illustrated is our standard for gap lathes of 36" swing and larger.

The simplicity of design of the head is shown by 27 spindle speeds (9 through face plate drive), being obtained by only 16 gears.

The clutch control handle for starting and stopping the machine is conveniently carried on the apron.

The sliding drive gears are of special heat treated chrome nickel steel and are all carefully rounded to facilitate meshing.

Photographs and specifications sent on request.

Representatives:—

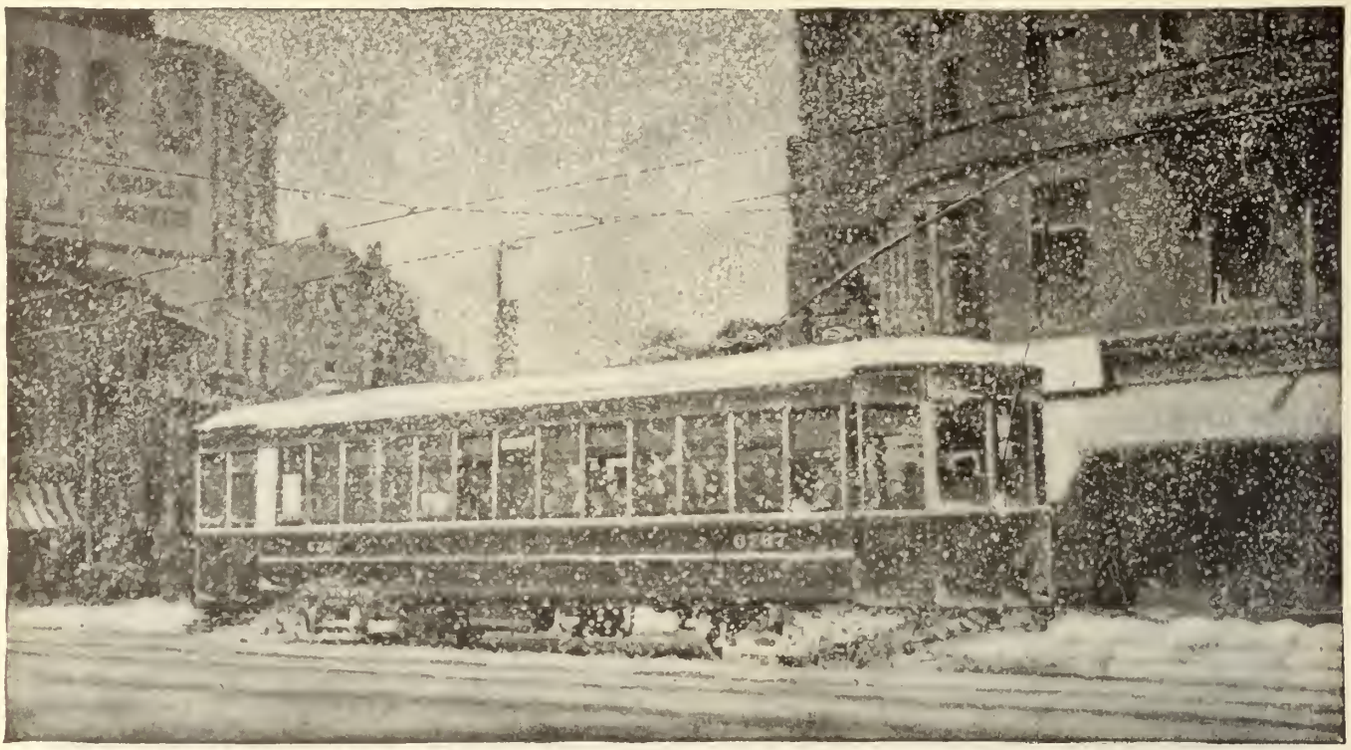
QUEBEC:
Williams & Wilson, Limited
Montreal

MANITOBA:
The A. R. Williams Machinery Co., Ltd.,
Winnipeg

Canada Machinery Corporation, Ltd.

GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.



Insure Your Overhead Construction

Rain, sleet and snow cannot affect C-G-E Sherardized Line Material. Every iron and steel part is thoroughly weather-proofed by the improved C-G-E process which constitutes the best insurance against rust and consequent breakage.

C-G-E Sherardizing not only gives a coating of zinc to the surface of the metal, but causes this coating to form, with the iron, an alloy extending considerably below the surface and becoming an integral part of the whole. Thus scaling is impossible even under the most severe and prolonged service.

C-G-E Sherardizing also furnishes efficient protection to threaded parts without materially altering their dimensions. It is also free from the weakening effect sometimes caused by hot galvanizing on malleable iron.

C-G-E Sherardizing successfully withstands the Preece test of successive immersions in copper sulphate solution and has proved its absolute reliability under prolonged exposure to salt spray.

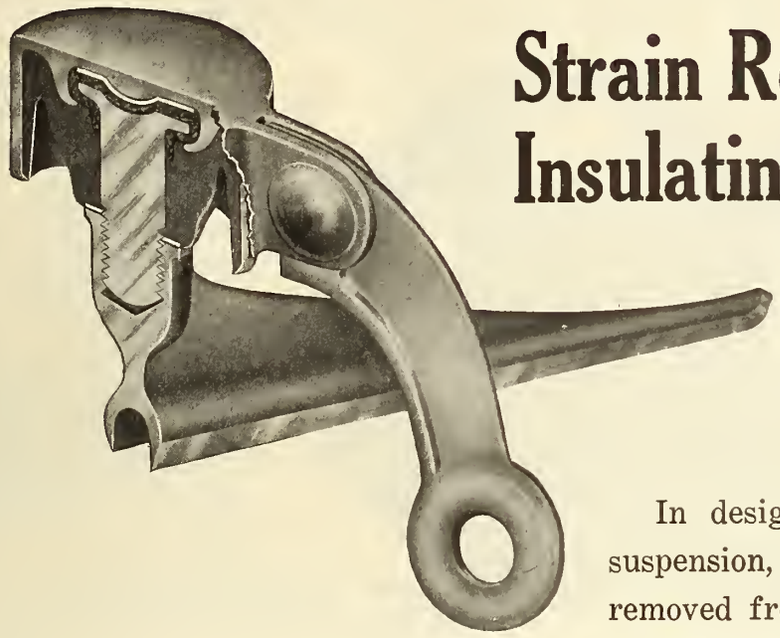
All C-G-E Line Material is Sherardized—a positive insurance against Winter's storms.

CHANGE
CHANGE

CANADIAN GENERAL ELECTRIC COMPANY,
LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



Strain Removed From Insulating Compound

In designing the Form H3 trolley suspension, mechanical strain has been removed from the insulating compound by the "crimped cup" fastening for the stud. This method gives great strength to the suspension and long life to the insulation, since the latter is relieved of all mechanical load by the metal rim of the cup. The stud is insulated from the metal cup with many layers of sheet amber mica, the strongest and best insulation known.

Electrical stress is well distributed by unusually long creepage surface.

All metal parts are Sherardized, thus preventing corrosion under the most severe weather conditions.

Form H3 Suspensions are furnished for straight line, single curve and double curve work.

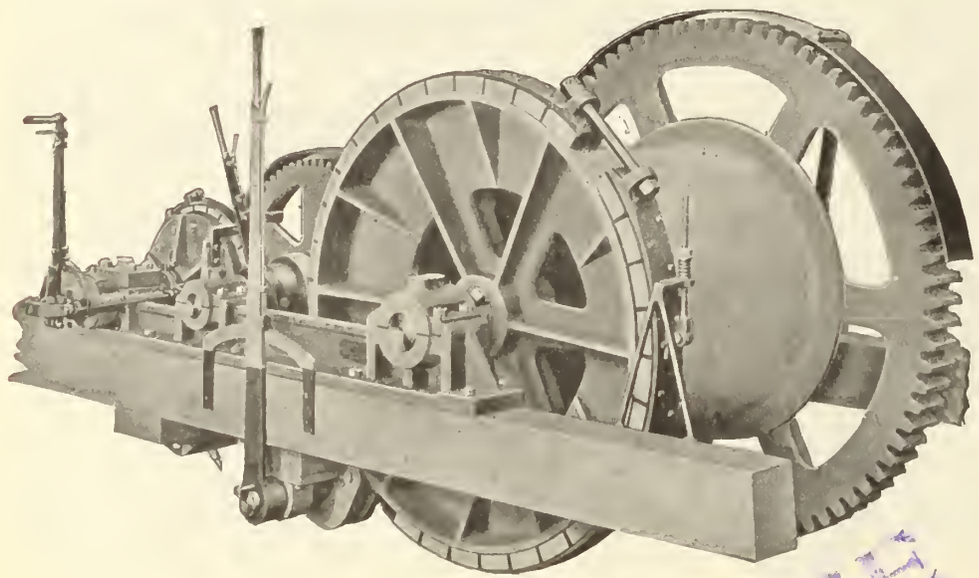
CANADIAN GENERAL ELECTRIC COMPANY,
LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

LIDGERWOOD RAILROAD SPECIALTIES

This Is One of Them—We Have Others



Incline Coal Hoist.

Incline Coal Hoist

For Coaling Stations

Contains, among other special features, an **Automatic Brake** to hold cars in any position on the incline and **Cork Insert Friction.**

Rope pull, 36,000 lbs. at the drum.

Drive — Steam, Electric, Gasoline, Compressed Air, Belt or Chain.

Bulletin No. 8.

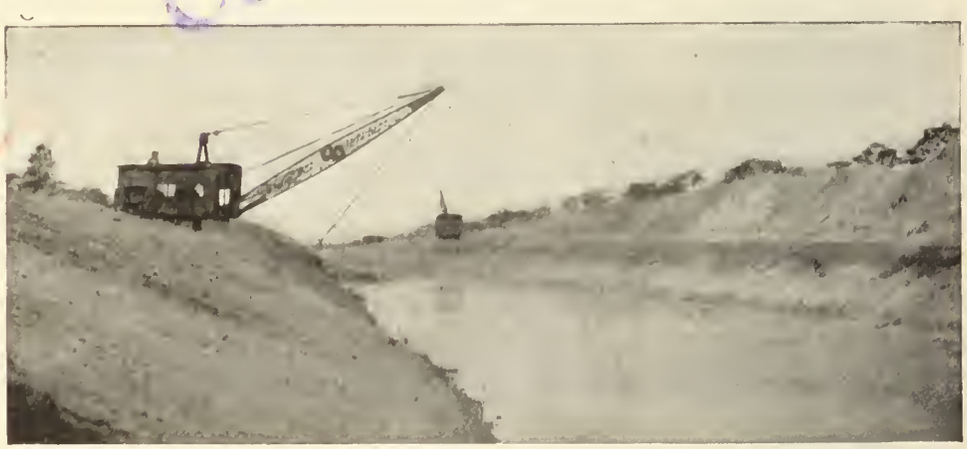
Lidgerwood-Crawford Drag-Line Excavator

Steam or Electric Motive Power

This illustration shows a finished canal dug by four Class "B. F." "Lidgerwood-Crawford" Excavators through swamp lands in Florida.

Built with booms from 40 feet to 115 feet in length. Especially adapted for irrigation and drains, railway embankments and levees, stripping overburdens from grand coal, iron ore, etc.

Send for bulletin 103 for complete description.



Excavator at Work.

CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

HEAD OFFICES, TORONTO. District Sales Offices, Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

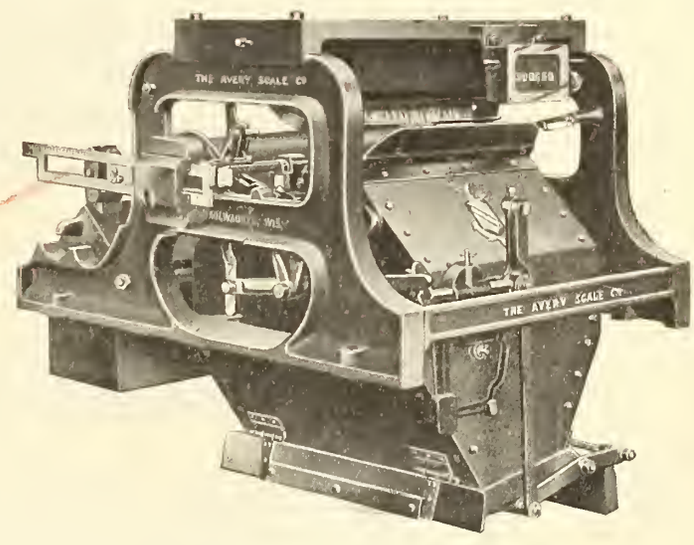
ATLAS BALL BEARING JACKS

McKiernan-Terry's Ball Bearing Jack

Can be elevated to one-thousandth part of an inch **and remain elevated with the load for any length of time.** This feature has been highly commended by contractors having delicate shoring operations to do, and their statement that when the Atlas has raised its load it would be found in the same position months afterward, is sufficient proof of the claim. Its adoption by many prominent railway and steamship companies, bridge builders, contractors, quarrymen, miners and others who require apparatus for heavy lifting purposes, is sufficient proof of its merit.

AVERY AUTOMATIC SCALE

The Automatic Grain Scale, here shown, is a recognized feature of every modern elevator and mill. Its convenience, practicability, unfailing accuracy, its saving in time, labor and valuable space, all recommend it to the progressive owner, who desires to run his business in the most efficient manner. There are 18 in the Government elevator at Port Colborne, Ont. The track scale for cars and trucks automatically weighs all cars passing over the platform and records individually and in total the **net** weights of the material on a counter, so that the total for any period may be immediately ascertained.



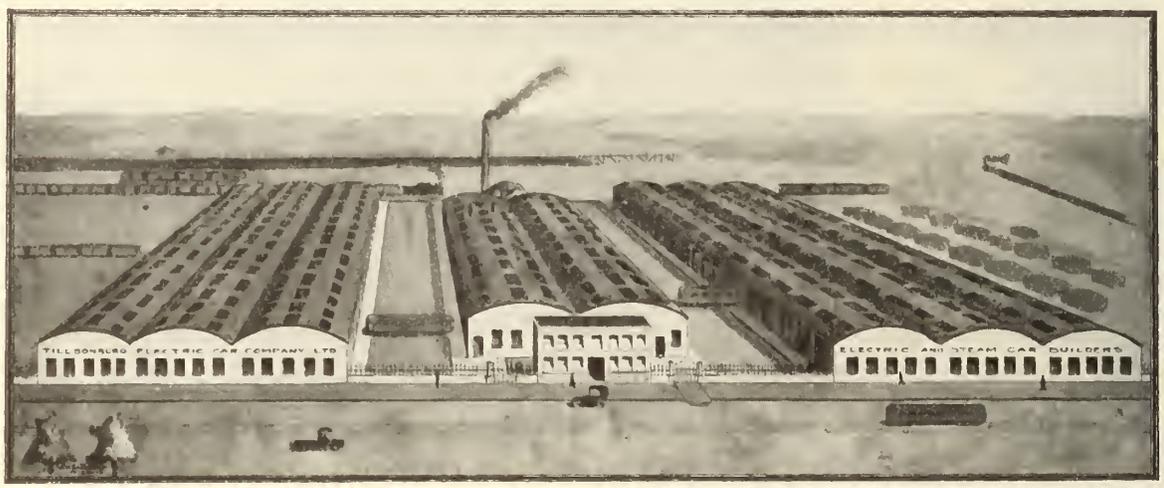
CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Dependable Deliveries on Electric Cars



We have already built Freight and Express Cars and now have under construction Interurban Cars.

The plant is capable of catering to your most exacting requirements, and the process of manufacture and methods of workmanship are open for inspection to all electric railway officials.

We are at all times ready to give your specifications and deliveries our best attention.

THE TILLSONBURG ELECTRIC CAR COMPANY, LTD.

Office and Works, Tillsonburg, Ont.

THE

Steel Company of Canada

LIMITED

Railroad Track Equipment

Angle Bars Tie Plates

Steel Track Spikes Bolts & Nuts

PIG IRON

Foundry Basic Malleable

Car Axles and Forgings

Invincible Fencing

Bar Iron Bar Steel

Arm Braces Wood and Machine Screws

Copper Trolley Wire, Telephone and Galvanized Wire

Nails Tacks Wrought Pipe

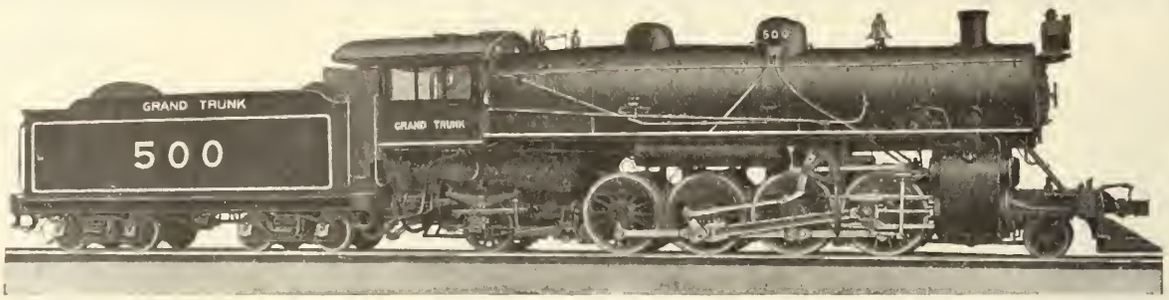
DISTRICT SALES OFFICES:

HAMILTON, TORONTO, MONTREAL, WINNIPEG

W. A. MacLennan, Vancouver, B.C.
J. B. H. Rickaby, Victoria, B.C.
H. G. Rogers, St. John, N.B.
Geo. D. Hatfield, Halifax, N.S.

INCREASED TRAIN LOADS

MIKADOS VS. CONSOLIDATIONS



Total Weight of Engine, 283,000 pounds; Weight on Drivers, 213,500 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 175 pounds; Cylinders, 27 x 30 inches; Maximum Tractive Power, 51,700 pounds.

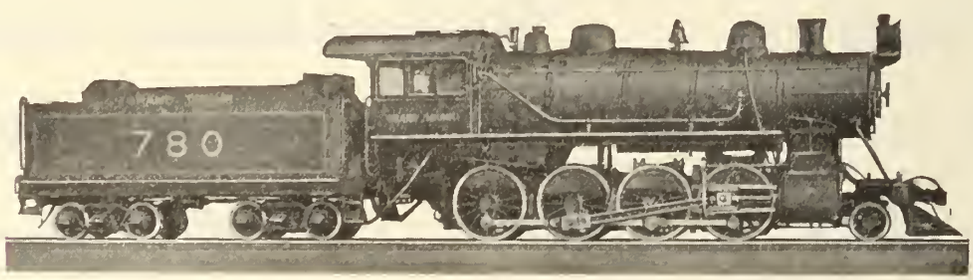
The substitution of Mikado locomotives for Consolidations on the Grand Trunk Railway System has enabled that road to greatly increase train loads and to properly provide for the growth of freight traffic.

This is shown by the following ratings that have recently been put into effect on the Western division:

	Miles	Helper Service	Consolidation	Mikado	Increase
Port Huron to Nichols	156½	None	2000	2800	40%
Nichols to Elsdon	168½	None	1700	2500	47%
Elsdon to Nichols	168½	For 5 miles	2000	2800	40%
Nichols to Port Huron	156½	None	2000	2800	40%

The Western division is made up of broken grades not exceeding 0.6 per cent., except a 5 mile 0.95 per cent. grade from Sedley to Valparaiso, where a helper is required.

Fifty additional Mikado locomotives are now being delivered by this company to the Grand Trunk Railway System.



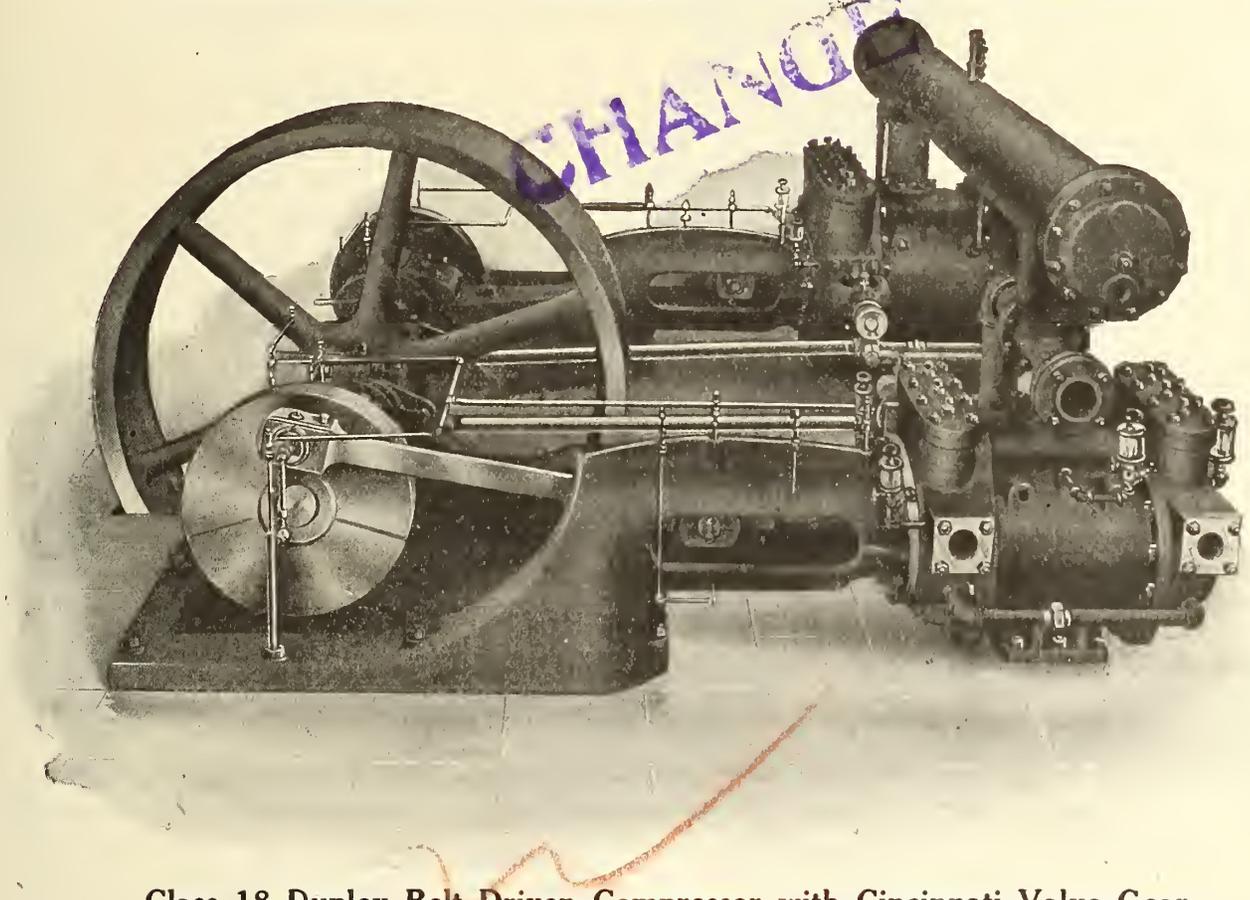
Total Weight of Engine, 212,000 pounds; Weight on Drivers, 186,000 pounds; Diameter of Drivers, 63 inches; Boiler Pressure, 210 pounds; Cylinders, 22½ and 35 x 32 inches; Maximum Tractive Power, 34,400 pounds.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

THE POWER BILL

Should be the determining factor when you are considering the installation of an Air Compressor in your shops. The more air you use the more attention you should pay to compressing it economically.



Class 18 Duplex Belt Driven Compressor with Cincinnati Valve Gear.

LAIDLAW-DUNN-GORDON COMPRESSORS
Are built by specialists in Air Compressor work.

Write for Catalogue RL518 to the Canadian Sales Agents.

MUSSENS LIMITED

MONTREAL	TORONTO	COBALT	WINNIPEG	CALGARY
318 St. James St.	155 West Richmond St.	Opp. Right of Way Mine	259-261 Stanley St.	10th Ave. and 3rd St. East

VANCOUVER	QUEBEC	ST. JOHN, N.B.	HALIFAX
101 Water St.	31 St. Louis St.	57 Smythe St.	78 Granville St.

The Right Way To Value Our Rail Report Bulletins

as exemplified in a letter from the chief engineer of an important western system.

"I beg to acknowledge receipt of your favor of January 15th attaching your Bulletin No. 4, which I am glad to receive and have found of great interest and benefit. I know of no suggestion which I could offer to improve the completeness of these excellent reports, which certainly contain a vast deal of valuable information. I am fully alive to the values derived in the proper use of FERRO-TITANIUM alloy, and shall heartily endorse its use when opportunity is presented."

AND THE WRONG

as stated in a letter from the purchasing agent of a southwestern road:

"I think you are in the best position to determine the value of these to you, as it is purely a question as to the value of an advertising medium. If it gets the business that is what you want. If it doesn't bring in the orders it is of no use to you."

In strictly advertising literature it is unusual for a manufacturer to print anything that is not entirely favorable to the advertised article, whereas in this series of Bulletins we are printing the results of tests on a consecutive series of samples regardless of the fact as to whether a particular test is favorable or not; and we are positive that, sooner or later, this will be generally understood and fully appreciated.

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents. Process and Products Patented.

General Offices and Works TPC Reg. U. S. Pat. Off. TRADE MARK. Niagara Falls, N.Y.

Pittsburgh: Oliver Building New York: 15 Wall St. Chicago: Peoples Gas Building

GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Sheffield, England

Here's Exactly Why Engineers Recommend

Scherzer ROLLING Lift Bridges

"Used All Over The World"

Designed on the Universal Rolling Principle

200 Scherzer Rolling Lift Bridges now in successful use in the

United States, Canada, England, Ireland, Wales, France, Holland, Belgium and other countries.

Egypt, Russia, India, Burma, Hawaiian Islands, Mexico, South America

Notice the simple, rigid, riveted one-piece movable bridge. Extraordinary simplicity and rigidity—greatest efficiency at less cost.

Some Reasons Why The Scherzer Rolling Lift Bridges Are Recommended by Engineers the World Over—

It is a riveted complete rigid structure.

Truss has no pin connections.

Very little machinery in structure—about 5 per cent. of total metal. (Machinery costs about three times as much per lb. as structural steel.)

Over 50 per cent. less MACHINERY than a design with trunnions.

So perfectly balanced as to require little power to operate.

Cost of maintenance low.

Raised and lowered without shock.

Less metal than other designs.

Gives maximum clearance of waterway without fender piles.

Machinery or truss not exposed to damage by boat lurching to side.

Concentrated loading at any point not as great as on a trunnion.

Counterweight is fixed. Height of counterweight not much over ordinary truss.

No high towers.

All parts easy of access.

No costly trunnions or heavy castings liable to be displaced.

No uplift to overcome before bridge commences to rise.

Requires shorter piers than a trunnion.

Trusses roll in direct line of standard distance c. to c. of ordinary trusses.

Grade of railway or bridge could be raised in a simple manner.

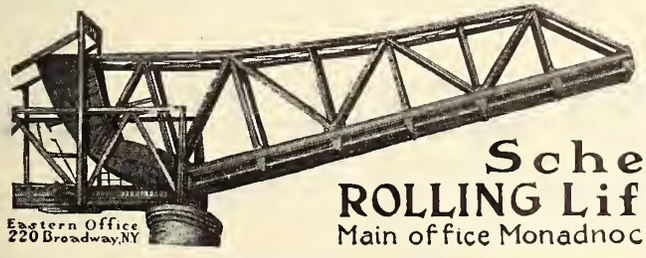
Scherzer ROLLING Lift Bridges cost less to install, operate and maintain—because they are simple, rigid, riveted structures with less metal than any other movable bridge and far less machinery. They are balanced in all positions, minimizing motor power. Their base is rounded just enough to let them roll forward and down, closing them; or roll back and up, opening them. This forward and back motion saves large amounts in material, weight and motive power, as a much shorter span can be used. When open, the bridge is back, away from the channel, preventing accidents from moving boats.

No friction-causing axles, journals or trunnions are used to carry the bridge. There is nothing to lubricate but the small motor and very simple machinery. The curved base rolls on level tracks, using the simple principle of track and wheel used by all railroads. The foundations naturally cost less because the bridge weighs less. No wharfage is needed on either side. New bridges can be added beside the old ones, avoiding wasteful replacement.

A Scherzer ROLLING Lift Bridge can be opened or closed in thirty seconds, a vast saving in time for land and water traffic. Tracks are fastened permanently to the bridge, doing away with rail lifts or end lifts, and preventing accidents. When open, these bridges are barriers against accidents and signal distant traffic to stop.

The Foundations Cost Less Because the Superstructure Is So Simple and Weighs Less.

Send for sketches, estimates and full information, showing how Scherzer ROLLING Lift Bridges are adapted for the widest channels, with particulars of demonstrated efficiency and economy.



Eastern Office 220 Broadway, NY

Scherzer ROLLING Lift Bridge Co.

Main office Monadnock Block Chicago, U.S.A.

Cable Address. Scherzer Chicago

The Place To Get REAL Signaling Information Is Where Signaling Is Being Done

A man must be a considerable genius to be able to sit at his **desk** and determine definitely about the value of signaling protection for operation over his **railway.**

He must be considerably more of a genius to determine from that same viewpoint the efficiency of a system as demonstrated on a road a thousand miles away from him.

What do you know about the efficiency of the Simmen System as demonstrated and thoroughly proven on four different railways in Canada and the United States? Have you inspected this system?

Is not the problem of signaling protection on your road of sufficient importance for you to **know** what a system as well known as the Simmen System has proven under actual operating conditions for a period of years?

A three days' trip will enable you to make a **personal inspection** of at least two of these installations, where you can determine for yourself by your own observation, as well as by the statements of the operating officials and the man on the job, just exactly the efficiency the Simmen System is giving.

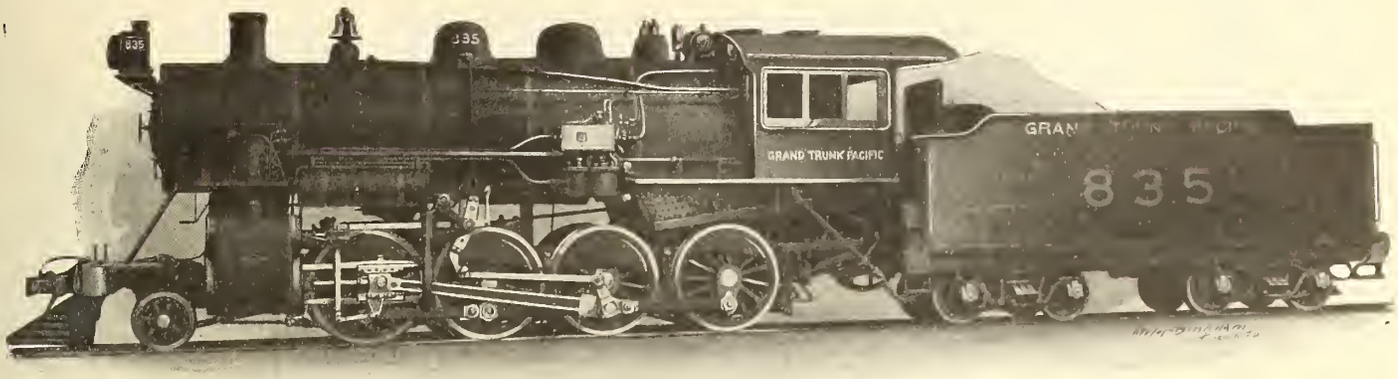
We can and will be glad to send you literature describing the Simmen System. We can and will be glad to send you a competent man who will tell you all about it as applied to **your** individual conditions, make a survey of your road and furnish you with an estimate, if you want it. But if you want to know exactly what the Simmen System is doing and what it can do for **you,** why don't you go and make an investigation yourself? Then you can make intelligent decisions.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

Canadian Locomotives

for contractors, industrial works, railroads, etc.



CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 16 tons. Weight of tender in working order 150,000 lbs.

We have had fifty years' experience as builders of locomotives. Our expert workmen are in many cases the sons or grandsons of men who worked in our shops many years ago. Combined with this long experience and expert workmanship, we have new equipment, efficient management and expert designers.

Special attention is paid to economy of maintenance; also to design of boiler and fire-box to ensure ample steam capacity and economy of fuel.

Duplicate parts are carried in stock for immediate shipment. We build locomotives to meet the Government regulations of the various Provinces. All sizes—all types—all practical gauges.

All materials used in the construction of Canadian locomotives are the very best. They are subjected to careful inspection and test, and any materials failing to meet the highest standards or showing defects of uniformity are rejected. Any materials developing defects in working are also rejected.

Handsome catalogue, 108 pages, 38 illustrations, with valuable tables and data, free to engineers, contractors or manufacturers—on request.

We are also builders of stationary boilers suitable for contractors or industrial plants.

Canadian Locomotive Company, Limited

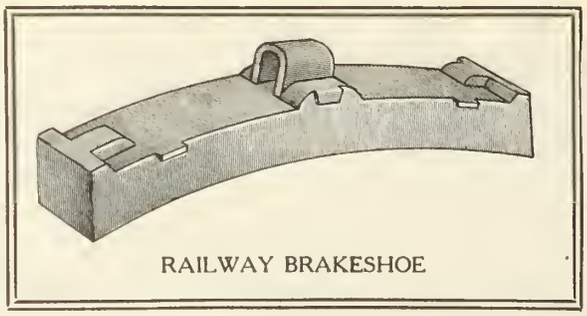
Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

Our Improved Reinforced

BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.

25-ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

Sherbrooke, Que.

CHANGE

For our weak points—*See our Competitors*

For recommendations—*See our Customers*

For further information—*See Us*

The Electric Railway Improvement Co.

Cleveland, Ohio

Canadian Government Railways

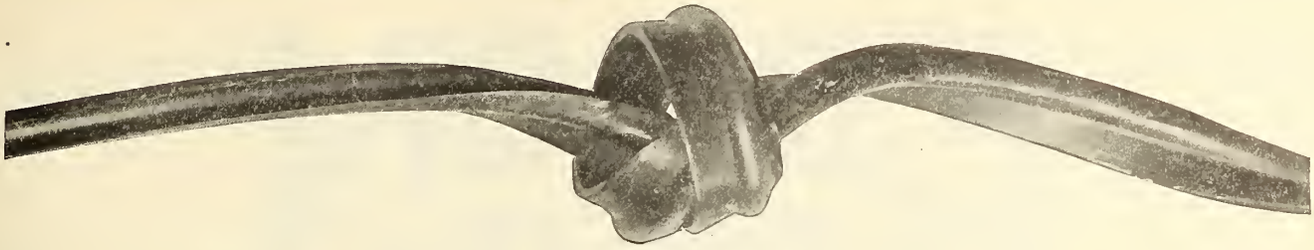
Intercolonial Railway

Prince Edward Island Railway

The Intercolonial is the only all-Canadian trunk line from Montreal to the Atlantic Sea-board. The Maritime Express, daily except Saturday, leaves Bonaventure Union Depot, Montreal, for Halifax, making connections for St. John, the Sydneys, Prince Edward Island and Newfoundland, and is noted for excellence of sleeping and dining car service. The local passenger service on the Canadian Government Lines, in proportion to the population served, is not equalled in America.

The operation of fast through freights, frequency of local and special freights, and the attention given to patrons of the railway, give every satisfaction to freight shippers.

18



O-B Extruded Metal Devices

Type CK Catenary Hanger.

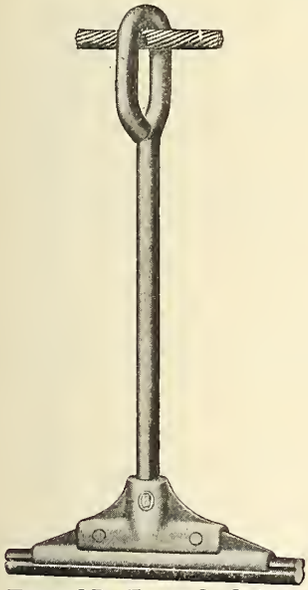
O-B Extruded metal is made by a special process which imparts to it a wonderful density and insures absolute uniformity both as to quality of metal and dimensions. It has a tensile strength of over 75,000 pounds per square inch and an elastic limit of approximately 50,000 pounds.

This ideal combination of great strength together with high elastic limit insures a metal that is extremely tough and yet is ductile enough to stand great distortion without fracture.

A convincing proof of this is shown by the illustration above, made from an actual photograph of a long section of O-B Extruded Ear metal which was pulled into a close knot in a testing machine under several tons tension without showing any fracture of the metal.

Its uniform ductility makes it easy to clinch snugly over the trolley wire and eliminates bumps or crimps, and thus insures an exceptionally smooth under-run.

A few of the many O-B Devices made from Extruded Metal are shown on this page. Let us enter a trial order to-day to prove their merits.

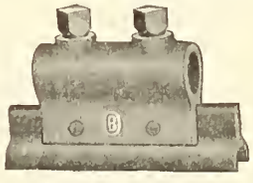


Type CR, Form 2, Catenary Hanger.

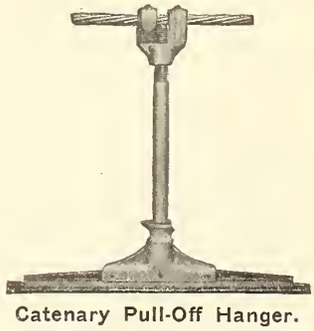
The Ohio Brass Co.

Mansfield, Ohio, U. S. A.

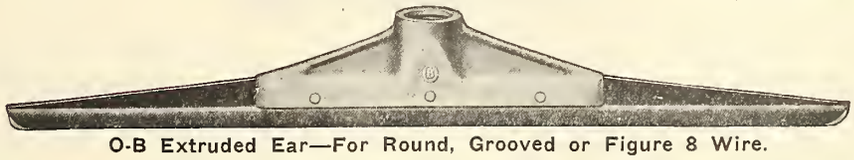
Type CL Catenary Hanger.



Catenary Feeder Connector.



Catenary Pull-Off Hanger.



O-B Extruded Ear—For Round, Grooved or Figure 8 Wire.

EDISON BSCO PRIMARY BATTERY

FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

EDISON-BSCO RSA Cell

An automatic block system should closely approach perfection, not only to properly protect traffic, but to inspire confidence in the men who are governed by the signal indications.

EDISON-BSCO cells are now and have for years been used on a majority of the signalled railways, and are a factor in making for dependable service. Competitive service tests result each year in lengthening the list of roads on which EDISON-BSCO RSA Cells are standard.

Practically all roads now insist on orders being filled with cells that comply with the Railway Signal Association specifications; the few that do not, evidently overlook the fact that the specifications were drawn to insure the most suitable and efficient cell for signal operation, and one in which the RSA renewal of any manufacture can be used, thus providing for competition.

Cells of the older types can usually be changed over to the Signal Association standard by ordering RSA renewals, covers and terminal nuts. The many advantages, incident to using the approved type, are gained, and if the EDISON-BSCO is selected a decided increase in efficiency results.

Correspondence solicited—Catalogue on request.

The Cheapest Form of Battery Energy

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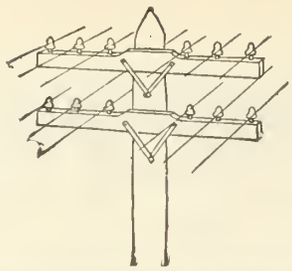

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assures a lasting line and minimum maintenance—when that material is

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The quality of Northern Electric line material is insured by rigid manufacturing specifications and inspection.

Service—an important item in your work—is assured by the large number of our distributing points—each one carrying large stocks for rush orders.

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Northern Electric Company

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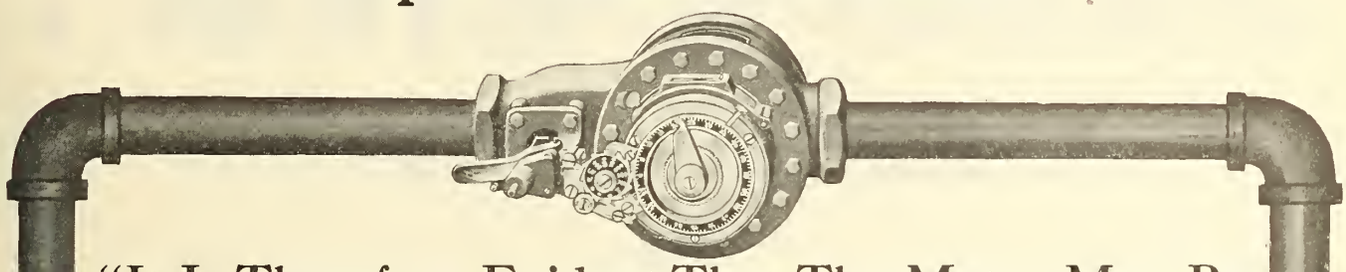
HALIFAX	CALGARY	VICTORIA

Bowser Self-Registering Pipe Line Measure



"It Is Therefore Evident That The Meter May Be Considered As Almost Absolutely Accurate."

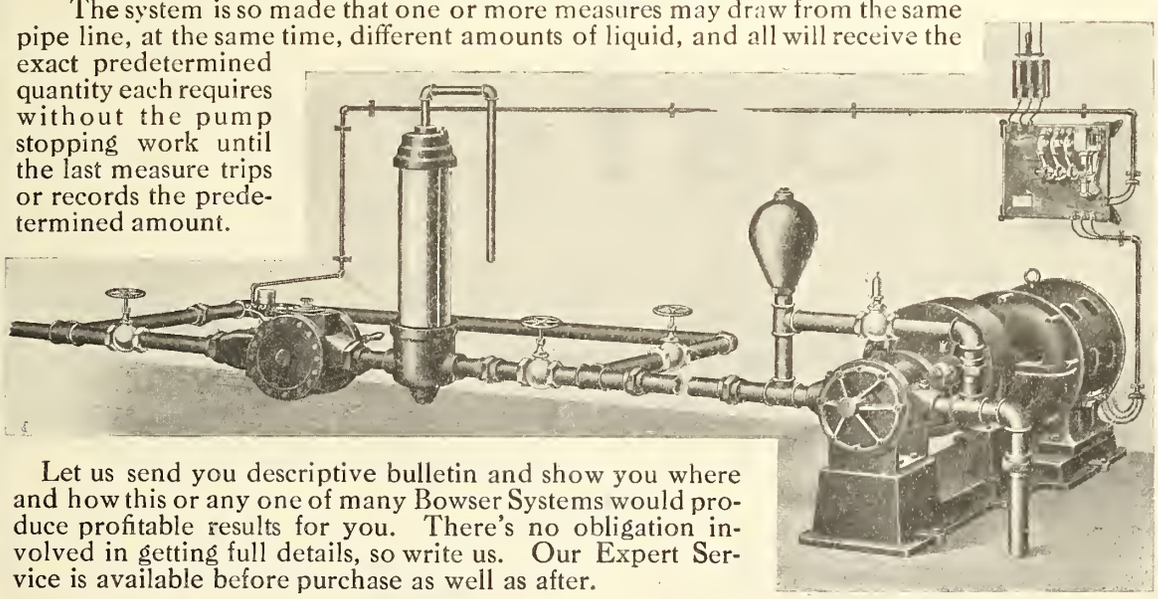
Extract from report of test made of Bowser 10-in. Fuel Oil Meter.
Report received from user, unsolicited by us.

Does Your Business Involve The Conveying and Measuring of Liquids?

Then here is a system that should instantly appeal to you—it embodies another Bowser Service idea—and Bowser Service means all the words imply.

The system consists of a Bowser Centrifugal Pump connected to a motor and located at the most convenient place within suction distance of the storage tank; one or more remote control automatic self-registering pipe line measures equipped with air separators, strainers, etc., placed in the discharge line any distance from the pump at the most convenient point for using. The measure is connected by wiring with a special electric remote control equipment which automatically operates the pump. The device controlling the flow of the liquid is located on the self-registering measure. It may be opened or closed by hand or shut off by the measure itself, when the predetermined quantity has been recorded.

The system is so made that one or more measures may draw from the same pipe line, at the same time, different amounts of liquid, and all will receive the exact predetermined quantity each requires without the pump stopping work until the last measure trips or records the predetermined amount.



Let us send you descriptive bulletin and show you where and how this or any one of many Bowser Systems would produce profitable results for you. There's no obligation involved in getting full details, so write us. Our Expert Service is available before purchase as well as after.

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Made by Canadian Workmen and Sold by Canadian Salesmen

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Insures

Safety
First --- Last

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All the Time

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HAVE NO EQUAL IN

QUALITY, EFFICIENCY AND ECONOMY

SOLE MANUFACTURERS OF

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LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION A SPECIALTY

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Galena Railway Safety Oil—Made especially for use in headlights, marker and classification lamps.

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TESTS AND CORRESPONDENCE SOLICITED

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WORKS

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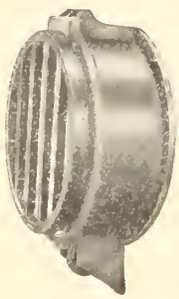
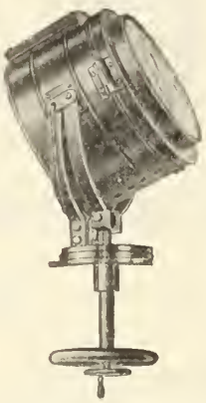
Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

Electric Headlights, Arc and Incandescent



Incandescent—
Type W.

Combined Carbon Arc and Incandescent—Type U.

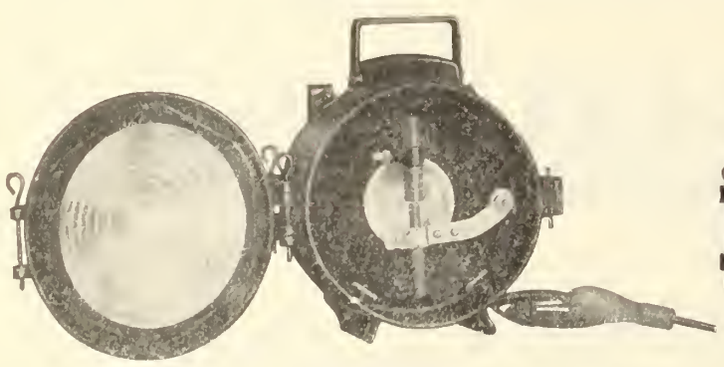


Carbon Arc, for Marine Use—Type X

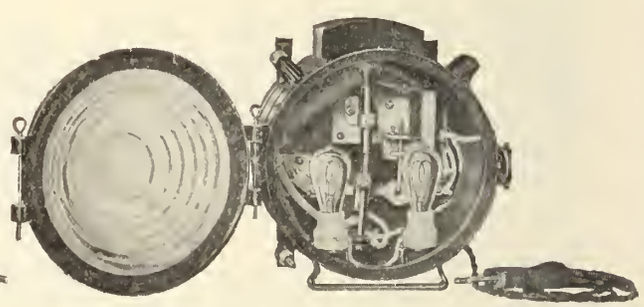
(Front View)

(Side View)

Incandescent—Type Z.

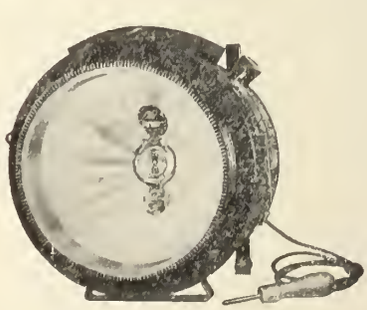


Two-Compartment, Electrode Arc (front view)—Type LK.



Combined Electrode Arc and Incandescent—Type LA.

Two-Compartment, Electrode Arc (rear view)—Type LK.



Carbon Arc—Type J.

Order from your dealer. If he does not stock them, write us.
Mail Coupons for Catalogues.

Crouse-Hinds Company of Canada, Ltd.

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Kindly send me Arc Incand. Headlight Catalogue.

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WE CARRY IN STOCK ALL SIZES
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GUYS
ETC.

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FITTINGS OF ALL DESCRIPTIONS.

THE DOMINION WIRE ROPE CO. LTD.
MONTREAL.

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Special sizes and lengths of ropes made to order.

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In Ore Service

OTIS DUMP CARS

Patented

THE MOST PRACTICAL CAR FOR ALL BULK FREIGHT.

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THERE ARE THOUSANDS OF OTIS CARS IN USE IN COAL AND GENERAL SERVICE

A SIMPLE, EASY OPERATING LEVEL FLOOR GONDOLA CAR THAT DUMPS THE ENTIRE LOAD

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All Steel Car with one section open.

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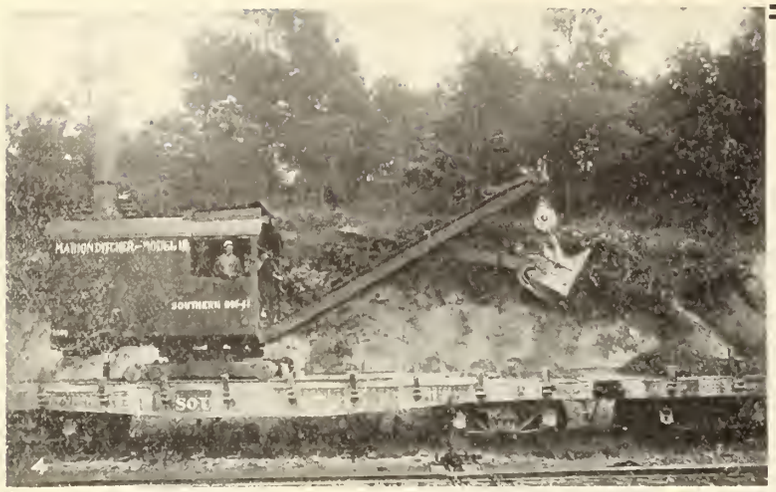

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HIGH SPEED JACKS

They lift and lower their full rated capacity

Four Times as fast as other Ball Bearing Jacks of equal capacity.

All Crucible Steel, light and strong.

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THE DOUBLE TRACK WAY

offers Excellence in Equipment, Excellence in Service

The Grand Trunk Railway System

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The only double track railway reaching all important centres in Eastern Canada. Fast Limited trains are operated between all important points on the System, including Montreal, Ottawa, Toronto, Quebec, Portland, Boston, New York, Buffalo, Detroit and Chicago. The equipment on the trains of the Grand Trunk is of the highest standard. Electric lighted Pullman Sleeping Cars on night trains. High grade Parlor-Library, Dining and Parlor-Library-Cafe Cars on day trains. Handsome Club Compartment Cars on Night trains between Montreal and Toronto, leave Montreal at 10.30 p.m., and Toronto at 10.45 p.m.

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The train de luxe, in Canada, runs every day in the year between Montreal, Toronto, Hamilton, London, Detroit and Chicago. This train is one of the finest and fastest long distance trains in the world.

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The new $2,500,000 hotel, situated in the heart of Ottawa, Ont., the capital of Canada, is one of the finest hotels on the Continent. Accommodation, 350 rooms. Rates, $2.00 and upwards. European plan.

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Located in Winnipeg on the same site as the old "Fort Garry" of Indian days. Centrally located. 300 rooms. Cost $2,000,000. The latest in hotel construction. European plan.

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Beautifully situated in Algonquin Provincial Park. The home of winter sports in Ontario. 2,000 feet above sea level. Winter attractions, snowshoeing, skating, tobogganning, skiing. Rates, $2.50 to $3.00 per day. $16.00 to $18.00 per week.

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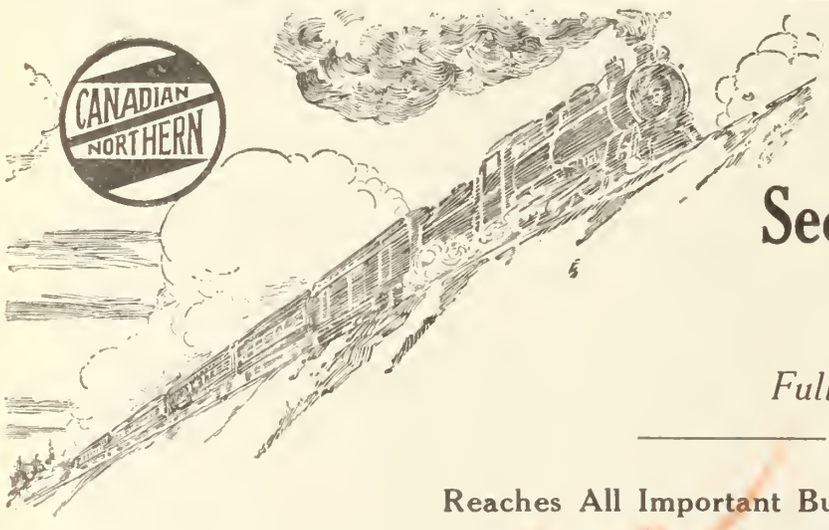

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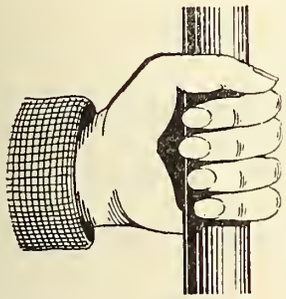
GETTING OFF
. USE
LEFT HAND



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By the use of warning signs, which can be placed immediately beside the grip rails on your cars, every passenger is warned to get off the car facing forward.

A sign is staring them right in the face all the time.

Keeping everlastingly at it will produce the habit.

We make these signs to order with any lettering, any colors, and in any size. They are guaranteed not to fade and will last a lifetime.

Write today for prices.

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ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

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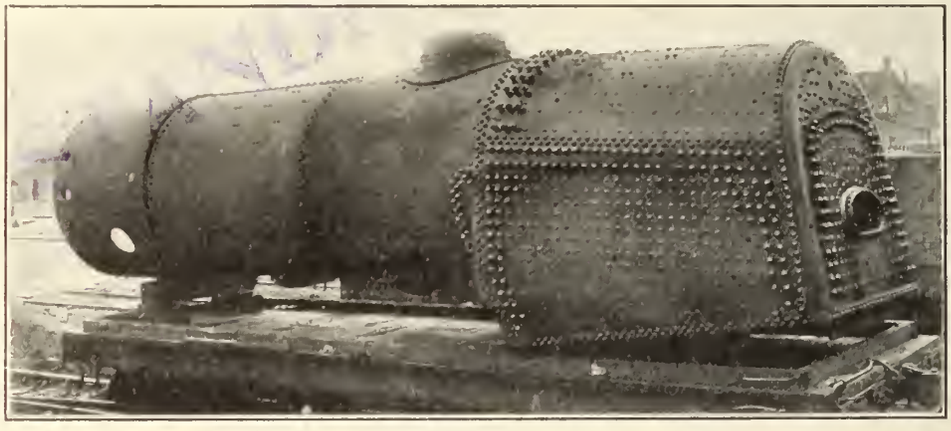
TATE FLEXIBLE STAYBOLTS



Time has Demonstrated

FIRST—that flexible staybolts produce more satisfactory and more economical results than rigid staybolts.

SECOND—that TATE FLEXIBLE STAYBOLTS are best of all, measured by every standard.

Ask for our New Catalog just issued.

FLANNERY BOLT COMPANY, Vanadium Building, Pittsburgh, Pa.

Manufactured and sold in Canada by Canadian Allis-Chalmers, Limited, General Offices, Toronto, Ont.

The Light of Day on the Right of Way

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Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

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Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency and economy. Standard cylinder supplies from one to two months' lighting of the average car.

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Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

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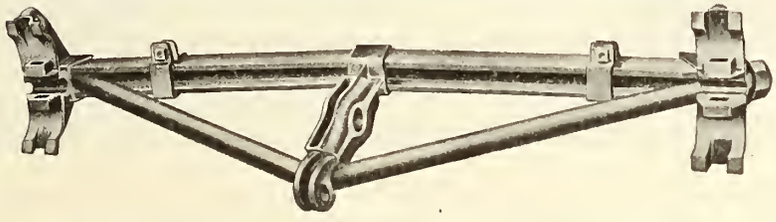

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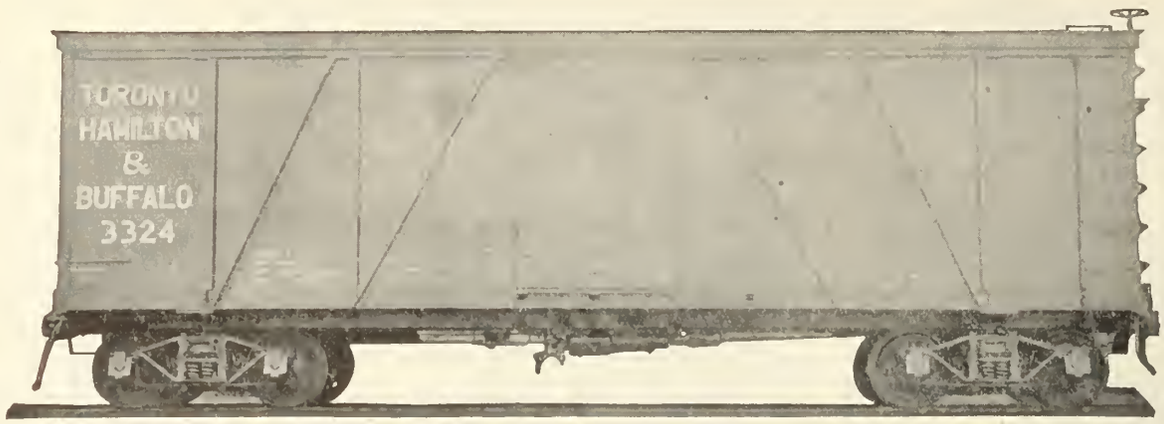

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Canadian Railway and Marine World

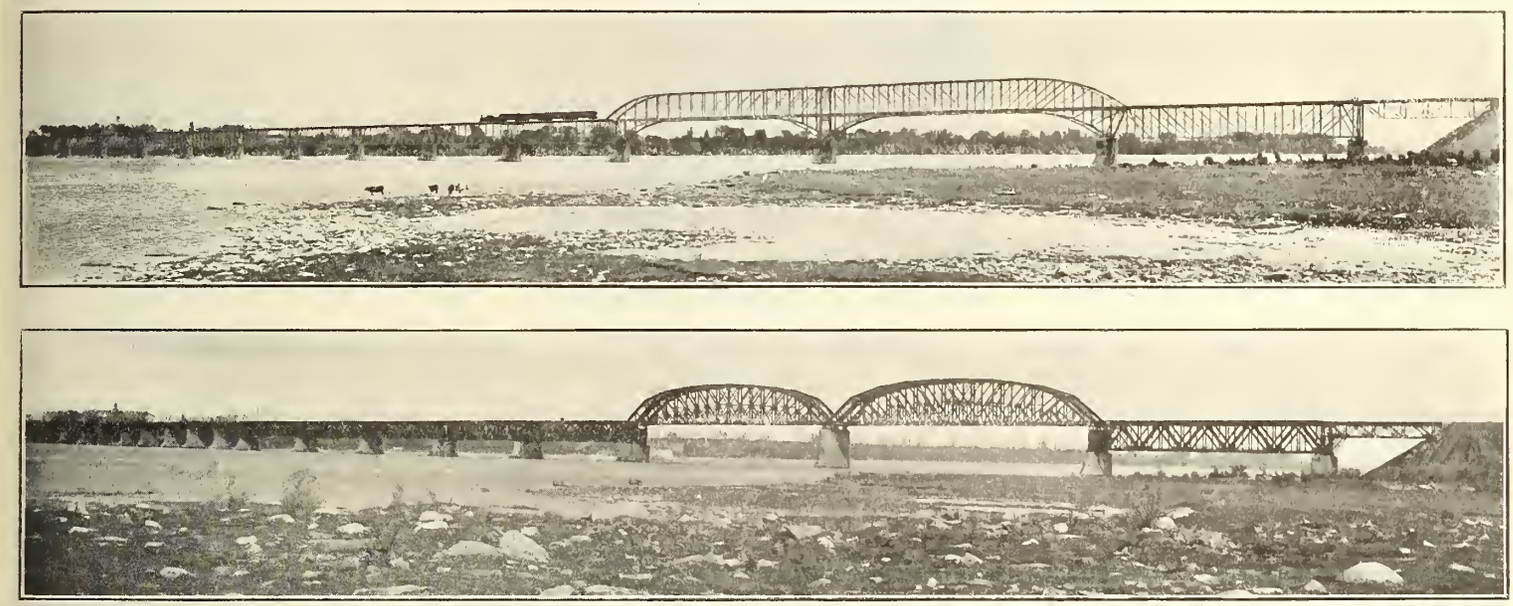
April, 1914.

Double Tracking of the Canadian Pacific Railway's St. Lawrence River Bridge.

By P. B. Motley, M. Can. Soc. C.E., Engineer of Bridges, C.P.R.

The C. P. R. crosses the St. Lawrence River about seven miles above Montreal, near the Indian village of Caughnawaga. This crossing is on the best of several trial lines which were located and estimated on, in the years 1883-1885. Amongst the more important were the Nuns' Island line and the Heron Island line, besides the Caughnawaga line which was eventually chosen. These trial lines are located between the G. T. R. Victoria Bridge and Lachine, the object in all cases being to obtain an outlet from Montreal towards the east and south with the least possible expenditure when the crossing of the river, as well as mileage, were taken into account. The Victoria Bridge is approximately 2 miles long, and flow in the river.

The decision as to the crossing having been made, the substructure of the bridge was begun, with the late P. A. Peterson, M. Can. Soc. C. E., as Chief Engineer, in the spring of 1885, and the erection of the steelwork was carried out during the winter of 1886-7. The contractors for the substructure were R. G. Reid & Co. (the late Sir Robert Reid), and the engineer in charge for the company was the late G. H. Massy, M. Can. Soc. C. E. The steel work was designed by the late C. Shaler Smith and the Dominion Bridge Co. was given the contract for its manufacture and erection. The steel was especially designed with a view to quick and simple erection, as it was imbut, considering that the pier supports were founded on rock and, in addition, had adjusting screws, so that the ideal conditions upon which the calculations had been made, could be at all times maintained (if necessary), the design was considered justifiable. The engines, for which the old structure was designed, were equal approximately to Coopers E35 loading, followed by a trainload of 2,500 lbs. per lineal foot, and the material in the structure was steel, except stringers, counters and windbracing where it was iron. The design lent itself admirably to rapid erection, which was borne out by the fact that the steel took only twelve months to erect ready for traffic. By 1910, the requirements of traffic had necessitat-



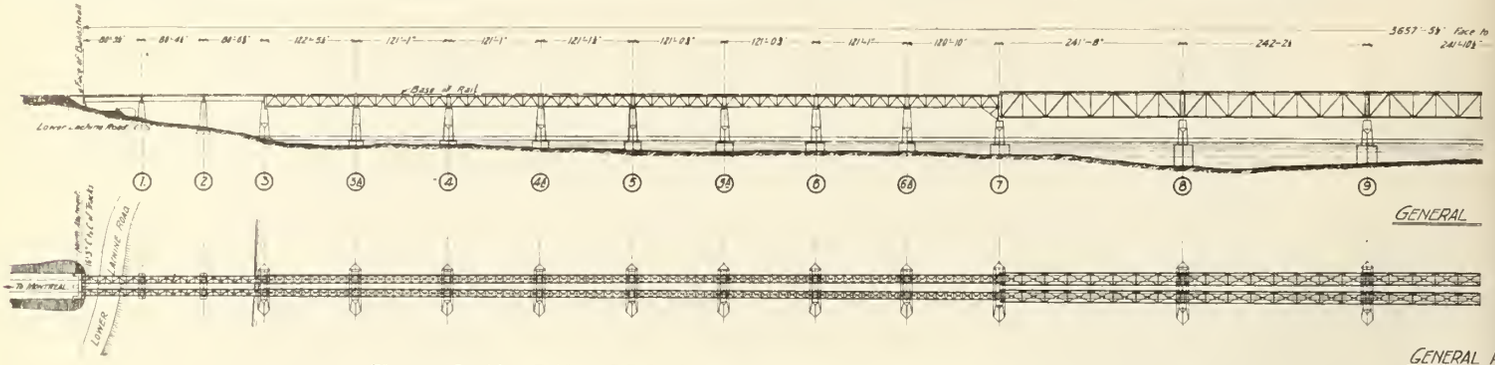
Lachine Bridge, C.P.R. Old and New Bridges from Caughnawaga Side, Looking Down Stream.

the engineers sought, if possible, to obtain a considerably less expensive crossing.

The Nuns' Island line gave a long crossing of the river in comparatively deep water. The Heron Island line gave a shorter bridge, located for the most part in shallow but very swift water composing the Lachine Rapids. In both these crossings the question of navigation had to be considered and difficulties connected with it weighed considerably in the discussions. The Caughnawaga crossing was finally adopted as being the most economical and as suiting best the requirements of navigation. The bridge is approximately five-eighths of a mile long, and navigation was taken care of by using two through spans of 408 ft. each over the deepest portion of the river to allow for waterway, and a headway of 60 ft. above highwater. This avoided the use of a swing or other movable span which, in this part of the swift flowing St. Lawrence River, would constitute a serious menace to navigation. The span lengths in the balance of the bridge were generally 270 ft. and 240 ft., and were dictated by the judgment of the engineers with respect to ice possible to place falsework in the deeper portions of the river where the 408 ft. spans are located. For these reasons the designers decided upon a peculiar type of construction. This consisted of a set of 4 spans (2 deck and 2 through) continuous over five supports, which enabled the steel work of the side or flanking spans to be erected first on falsework, and the main channel spans to be erected by the cantilever method, the flanking spans being used as anchors,—some steelwork was also cantilevered both ways from pier 13 located in the centre of the channel. When these several spans were connected, they formed, as aforesaid, a continuous span over five supports, fixed at the centre on pier 13 and expanding both ways therefrom. The channel spans, as noted above, were made of through design to allow steamers to pass under at full speed, and Mr. Shaler Smith solved the problem of combining deck and through spans by a very beautiful and interesting method, that of curving the ends of the spans, as shown in the photigraphs and plans. This procedure is open to criticism from a mathematical point of view, ed the use of much heavier locomotives than were considered in the original design and, in addition, the increasing volume of traffic made it advisable to double track the line from Montreal eastward. Bids were, accordingly, called for on designs prepared by the C. P. R. engineers, and a contract was subsequently entered into with the Dominion Bridge Co. for the removal of the old spans and the erection of the new. A contract was also made with The Foundation Co. for the extension of the substructure to accommodate the extra steelwork. In the old structure there was no traffic to be taken care of, but in the new it was not allowable to interfere with the regularity of passing trains. This considerably complicated the problem, and, under the circumstances, it was decided that the only possible way of ensuring all the requirements was to build two independent single track bridges, and remove the old bridge in sections, transferring traffic from side to side, as will be described later.

SUBSTRUCTURE.—From observations during the life of the old bridge, it was noted that the ice of Lake St. Louis generally

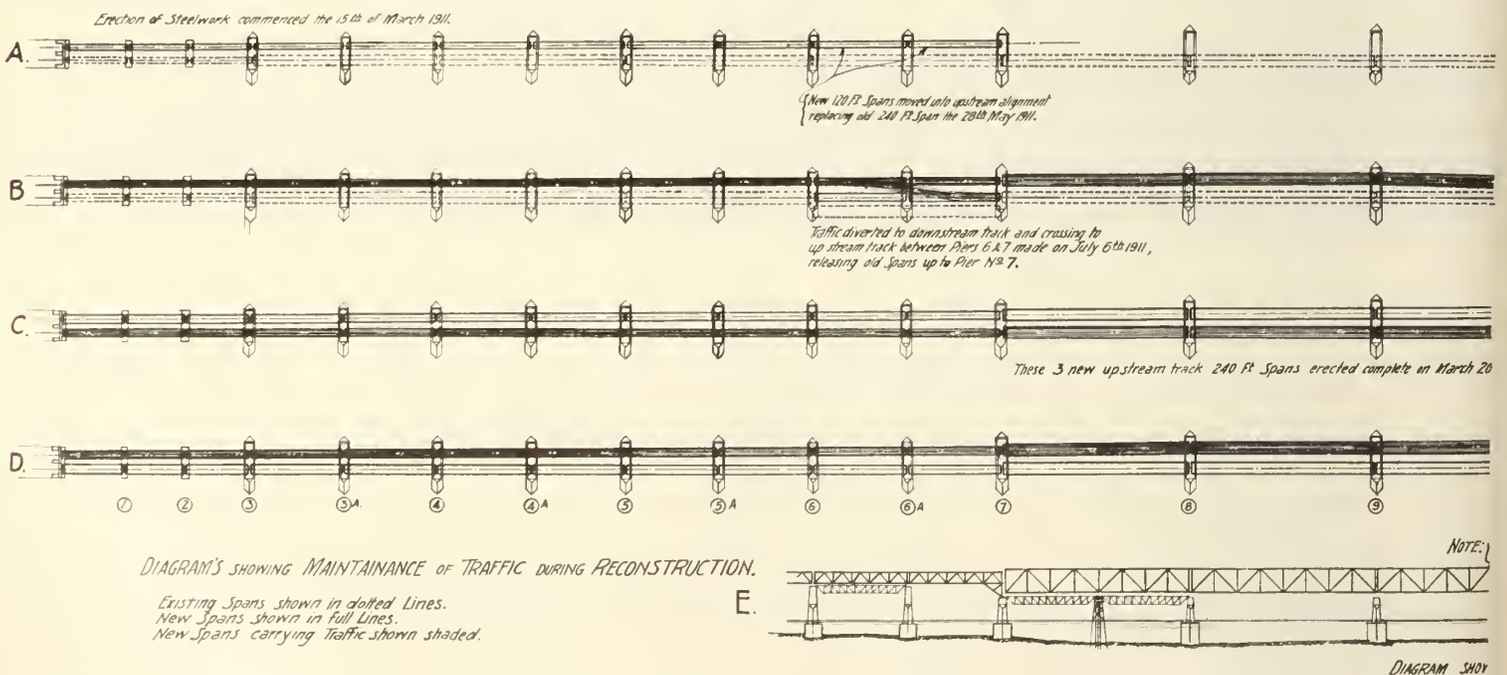
grounded on the Lachine side of the river in shallow water, and, after breaking up, floated under the Lachine end of the bridge in small pieces in a manner which did not of course, would result in serious cracks in the bonding above the water line. The work at piers 8 to 14 was carried out in still water, which was obtained by the use of which it was built up by the C. P. R.'s forces. The pneumatic plant used on piers 9 to 13 was of the type designed and operated by the Foundation Co.



Plan 1.—Lachine Bridge, C.P.R. General Elevation and Plan. (See opposite page.)

seem to justify the existence of four 240 ft. spans between piers 3 and 7. It was, therefore, decided to bisect these spans by the building of new intermediate piers 3a, 4a, 5a and 6a), and using eight 120 foot spans instead of four 240 ft. This resulted in considerable economy in cost. Between piers 7 and 11, it was not considered advisable to make a change. With these exceptions, the structure was renewed in span lengths similar to those which originally existed, but, instead of the continuous spans between piers 11 and 15, it was decided to use simple spans of ordinary deck and through types, as shown on the plates. The new second track was placed on the downstream side of the existing bridge. The added masonry was bonded into the old above water line, while below the water line open caissons were sunk generally to the same hard bottom to which the original masonry was carried, except in the case of piers 9 to 13, where pneumatic caissons were found necessary. Caisson 13 was square ended where it butted against the old masonry, and pointed at the down-

Skidways on Down Stream Span 13-14.

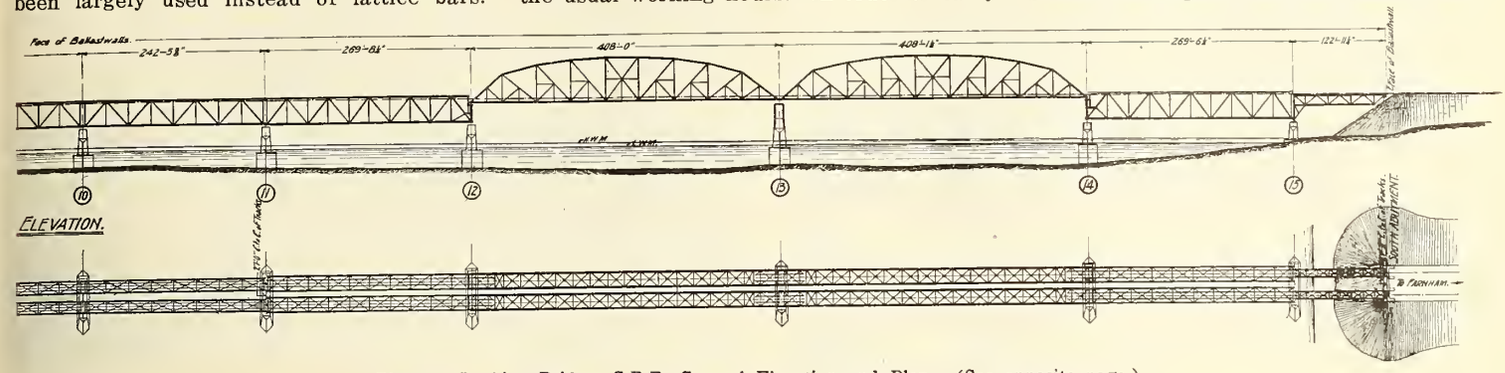
SUPERSTRUCTURE.—The 80 ft. deck plate girders at the Lachine end of the bridge are the C. P. R. standard design, and are single track spans placed alongside each other. The 120 ft. spans are deck Warren truss spans with rivetted connections, their ties resting upon the top chords. These spans are also simple single track spans laid abreast of each other. The 240 ft. spans are also Warren trusses with rivetted connections, and have the usual floor system of stringers and floor beams (2 stringers per track) rivetted against the vertical posts immediately under the top chord. The upper laterals are also rivetted immediately below the top chord, and connected with the top flanges of the stringers, where they intersect with same. The 270 ft. flanking spans are Warren trusses, and, while longer in the panel lengths than the 240 ft. spans, are the same in general description. Typical details are shown on plan 4, from which it will be seen that all the web members, except the diagonals near the centre of the span, have solid web plates down the centre of the same, and,

Plan 2.—Lachine Bridge, C.P.R. Diagrams Showing Maintenance of Traffic During Reconstruction, and Method of Erection. (See opposite page.)

stream end. It was carried about 7 ft. lower than the bottom of the old pier, because it was found that the shale immediatly under the same was of such a description as to make it advisable to go deeper in order to make sure that there would be absolutely no settlement, which, wing dams composed of rock-filled cribs sunk immediately upstream at an angle of about 45 degrees so as to deflect the current. Masonry was started in June 1910 and was finished in Nov. 1911, except the upstream end of pier 13, which was left till the removal of the old steelwork, after where necessary, double lattice on the flanges. For the deck spans the Warren type of truss was found to be more economical than any other. The general dimensions and typical details of the 408 foot spans are shown on plan 3. These spans are of the subpanelled Pratt truss

type, and the top chords are curved, as far as possible, to an approximate parabola. In the web members, solid web plates have been largely used instead of lattice bars.

work. There were on an average 10 trains between 8 a.m. and 12 noon, and sometimes an average of eight in the afternoon during the usual working hours. In order to carry

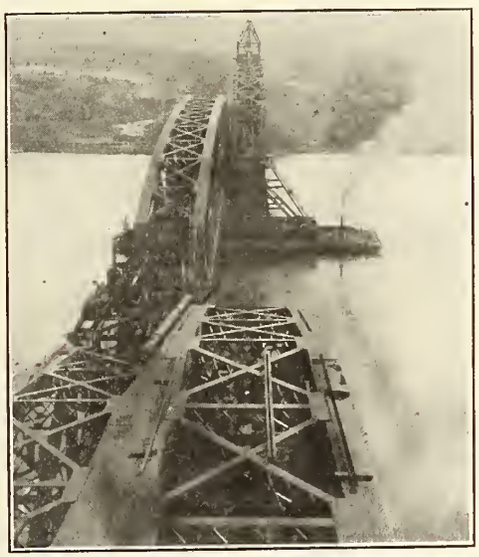
bodily into the location of the old 240 ft. span, and the latter moved upstream upon timber towers prepared for it. The downstream new spans between piers 6 and 7



Plan 1.—Lachine Bridge, C.P.R. General Elevation and Plan. (See opposite page.)

In addition to this, the vertical posts are all of I sections, composed in most cases of bulb angles and web plates, and, where necessary, there are stiffeners on the webs especially of the longer vertical posts. The top and bottom chords are of very stiff cross section, partly to allow them to be cantilevered out during erection. The 408 ft. spans were also calculated for the stresses caused by the special method of cantilevering and launching, which will be described later. The portal and other subsidiary bracing is generally of a stiff design, consistent with the main trusses, to which it is attached. The 270 ft. spans were also calculated for the concentrated weight of one end of the 408 ft. spans, which was to be carried upon them during the process of launching.

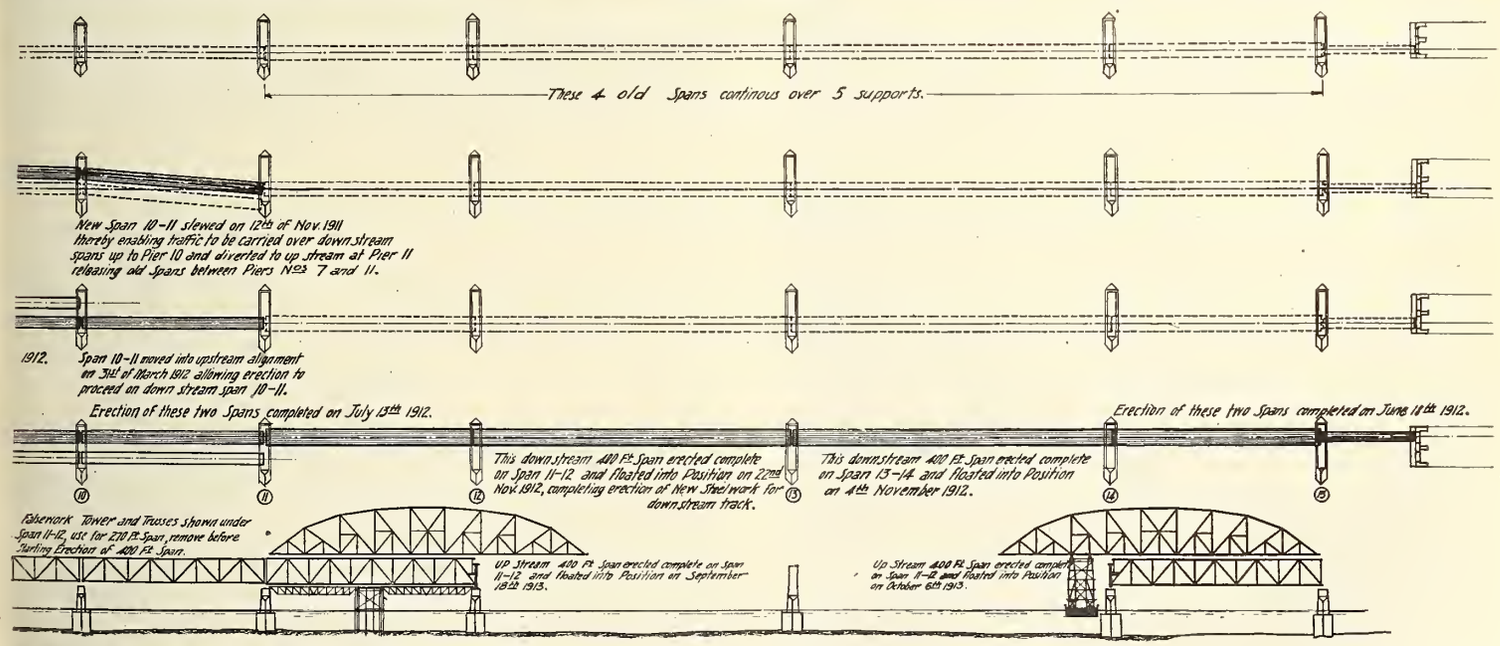
The alignment on the bridge is ruled by the overall width of the 408 ft. spans. At pier 11, and the south abutment, the two single track bridges are 27 ft., centre to centre, and from pier 11 to the north abutment the spans grow closer together till they are 16 ft. 4 ins. at the north abutment. This slight kink in the alignment is quite im-



Bird's Eye View from Top of Up Stream Span 12-13, Looking South.

were then erected. Traffic was now diverted over the four new spans between piers 6 and 7 by means of a cross-over laid on suitable wooden ties spanning from span to span, so that all old spans between pier 7 and the north abutment were thus released. These were taken down, and new spans erected. Next, the new spans on the downstream side between piers 7 and 11 were erected.

In order to release some more upstream spans, it was simply necessary to slew over the 240 ft. span between piers 10 and 11, as shown on diagram B, plan 2, all new spans between the north abutment and pier 11 now being under traffic and all old spans between these points being released. After the new spans on the upstream side between the north abutment and pier 10 had been erected, it was simply necessary to pull span 10-11 into alignment, as shown on diagram C, plan 2, and thereby put the traffic on all new spans between the north abutment and pier 11, the old spans between pier 11 and the south abutment being still under traffic. Then spans were erected between piers 10 and 11, 11 and 12, 14 and



Plan 2.—Lachine Bridge, C.P.R. Diagrams Showing Maintenance of Traffic During Reconstruction, and Method of Erection. (See opposite page.)

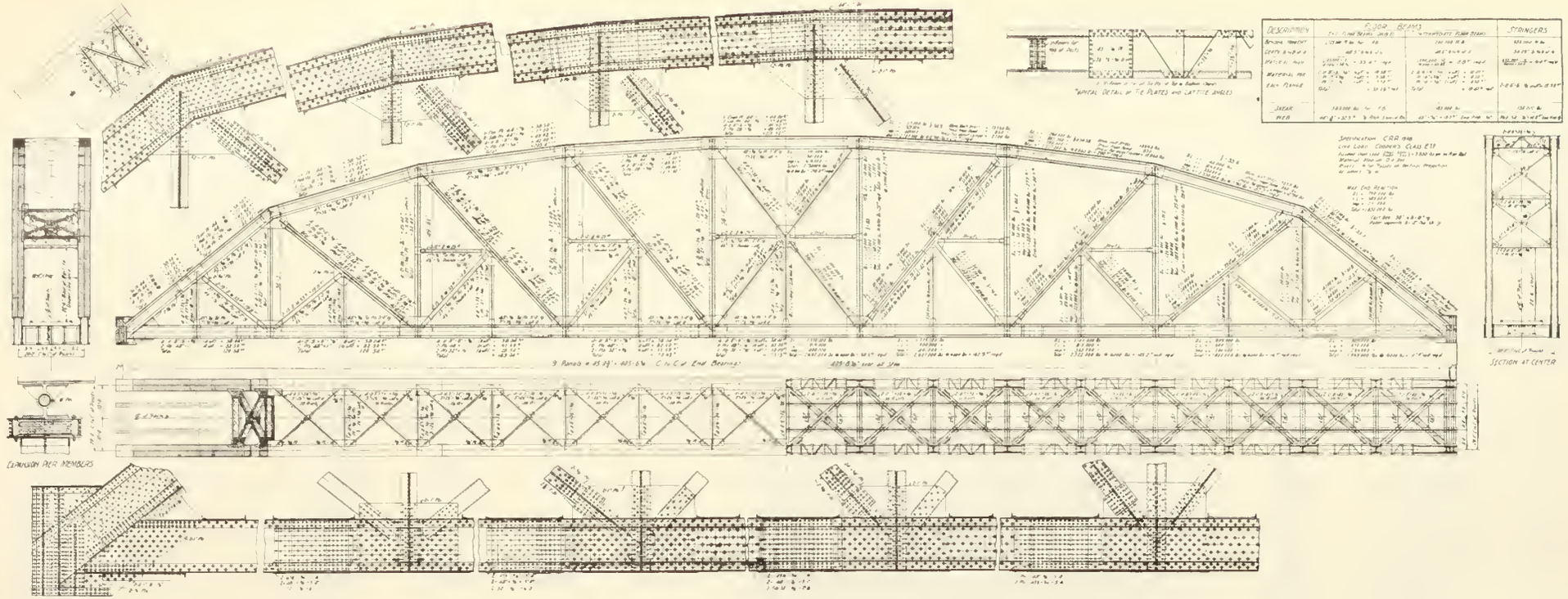
material from an operating point of view, and allowed a valuable saving in masonry from pier 11 northwards.

ERECTION.—One of the most important problems in the work was the maintenance of traffic during the erection of the steel-

out the work without interference with traffic, it was decided to erect first, all spans on the downstream side from the north abutment to pier 7 (See diagram A, plan 2.) When this was done the two new 120 ft. spans between piers 6 and 7 were moved

15, and 15 and south abutment. After these were finished, the 408 ft. downstream spans were erected on top of the 270 ft. spans, as shown in the photographs and in diagram E, at the lower portion of plan 2.

The modus operandi in connection with



Plan 3.—Lachine Bridge, C.P.R. Diagram of Stresses and Material of 400 ft. Span.

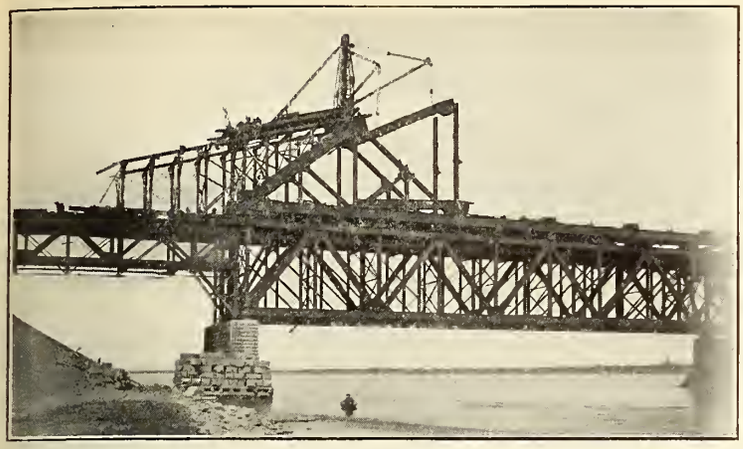
these 408 ft. spans constitutes one of the most interesting portions of the work. The scheme was to launch the span endwise with its rear end supported upon an ingenious truck or buggy, while the forward end was supported on a large scow of special design. In order to avoid overstraining the adjacent 270 ft. span by the concentrated loads of the sliding gear, an ingenious framed structure was devised by which it was possible to so distribute the end reaction over the floor system of the carrying span, that no part would be strained over allowable units. A diagram of this truck or buggy is shown on plan 5, from which it will be noted that the secret of the construction lies in the fact that there is no vertical tie inside the triangulation but, in its place there is an exterior strut, which by reason of the proportions of the members, carries a reaction which is equal to the reaction at each of the outer ends of the triangulation. Thus, there is a three point bearing with equal reactions. The skidways consisted of 8-100 lb. greased rails (2 sets of 4), on which cast steel skids or slippers were imposed. The scheme was to move the span forward until it came to the last panel of the 270 ft. span, where, of course, the front bearing of the three would naturally tend to pass overboard. In order to satisfy all conditions, the two outer bearings were here abandoned, and the span wedged up on the centre bearing only. The whole reaction being thus concentrated on one point required the end panel of stringers in the 270 ft. spans to be reinforced. Details of this floating operation will be referred to later. The 120 ft. spans were erected by means of a temporary span, as shown on general diagram E, on plan 2. The 240 ft. spans were erected by the same 120 ft. temporary trusses supported upon a wooden pier in the centre, as shown, between piers 7 and 8, and in the photographs.

The 270 ft. spans were erected by these same 120 ft. temporary trusses supported on a temporary tower about 30 ft. wide, as shown on diagram between piers 11 and 12, the only falsework at any time in the river being the towers as shown, and at no time was railway traffic placed upon the temporary falsework. This was required by the railway company from the beginning of the work.

The four 408 ft. spans were alike in weight and general characteristics, but two methods differing somewhat in detail were used in launching them. The two downstream spans were launched on the same set of carrying scows, but with a pilot scow upstream to take up the slack in the cables and to otherwise control the movement of the spans during launching. The experience gained in launching the two downstream 408 ft. spans led to the abandonment of the pilot scow for the placing of the upstream spans. Under this arrangement the new spans were allowed, while travelling, to rub along a specially prepared vertical skidway bolted to the lower chords of the downstream spans already in place. Details of the actual operation of launching are clearly shown in the plates and in the photographs.

The carrying scow was really composed of two independent scows with two 100 ft. deck plate girder spans (4 girders) placed on them, to equalise the load over the two scows. On these equalising girder spans was erected a stiff timber tower on which the span itself was carried. Anchors, each composed of concrete blocks securely strung together, weighing approximately 76 tons out of water or 52 under water, were placed about 1,500 ft. upstream from the bridge, and generally respectively in line with piers 12 and 13, but on the land above pier 14 a "dead man" was used composed of an I beam embedded in the rock. On the main carrying scow a dynamometer was inserted in the reaving of a 14 roped tackle which was attached to the main anchor line, in order to record the pull on the anchor ropes. The readings taken from this dynamometer fully corroborated experiments which had previously been made regarding the resistance of floating bodies to the current in the river. They also agreed generally with Froudes formula $R = fs \left(\frac{v}{6.9}\right)^2$ see plan 6. The current in the river varied between 5 and 8 miles an hour, according to the location where the meter was used.

DETAILS OF LAUNCHING OPERATIONS.—When all was ready, an ordinary Lidgerwood unloader, such as is used on railway work, was located and strutted in a position where a direct pull could be made from the drum of the engine. Communication was at all times maintained between the man in charge of the Lidgerwood engine, those in charge of the scows and the man in full charge of the operations, by means of a system of flag signals. The span was started by a number of jacks, after which the Lidgerwood engine controlled the whole of the movement and at no time was there any unexpected trouble. While the span moved forward the anchor cables allowed the anchor scow to float across the current with a radial motion. This necessitated the cable connecting the anchor scow with the main scows to be constantly shortened in order to maintain the true alignment of the span. As has already been stated, this anchor scow was used only in connection with the floating of the two downstream 408 ft. spans. It was omitted when floating the upstream 408 ft. spans, which were allowed to rub against the neighboring spans already in position.



Commencement of Erection of Down Stream Span 13-14 on Deck of Span 14-15.

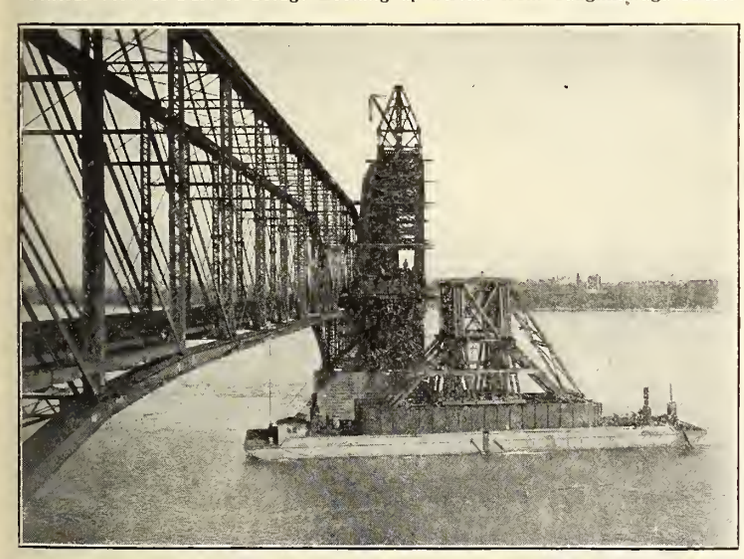
Down Stream Span 13-14, Partly Erected on Deck of Span 14-15. Showing Portion Being Cantilevered Over Stream. It Was Under This That the Barges Were Placed.

Down Stream Span 13-14 During Launching. Span Has Just Been Landed.

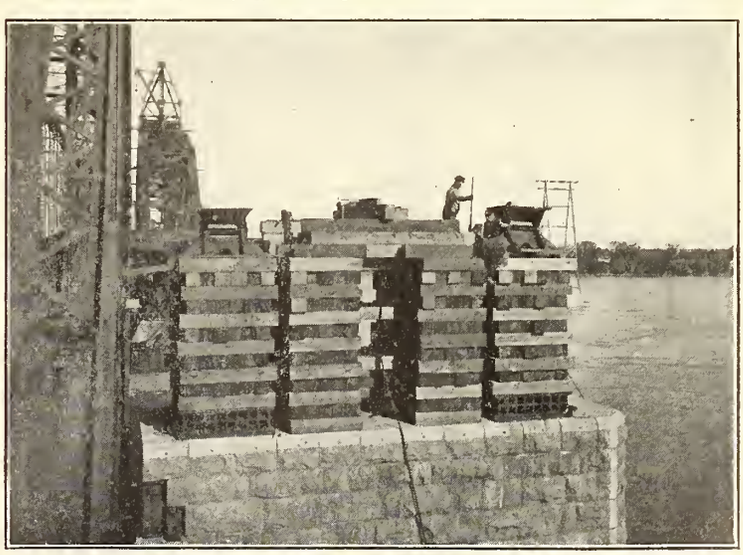
Down Stream Span 13-14 Being Launched, Showing the Lidgerwood Engine and Sliding Buggy.

General View of Part of Bridge Looking up Stream from Caughnawaga Shore.

Down Stream Span 14-15, Showing Falsework, Trusses and Wooden Tower.



Carrying Barge Being Placed in Position Under Down Stream Span 12-13. Barge Was Lowered by Use of Water Ballast Before it Could Pass Under Span.



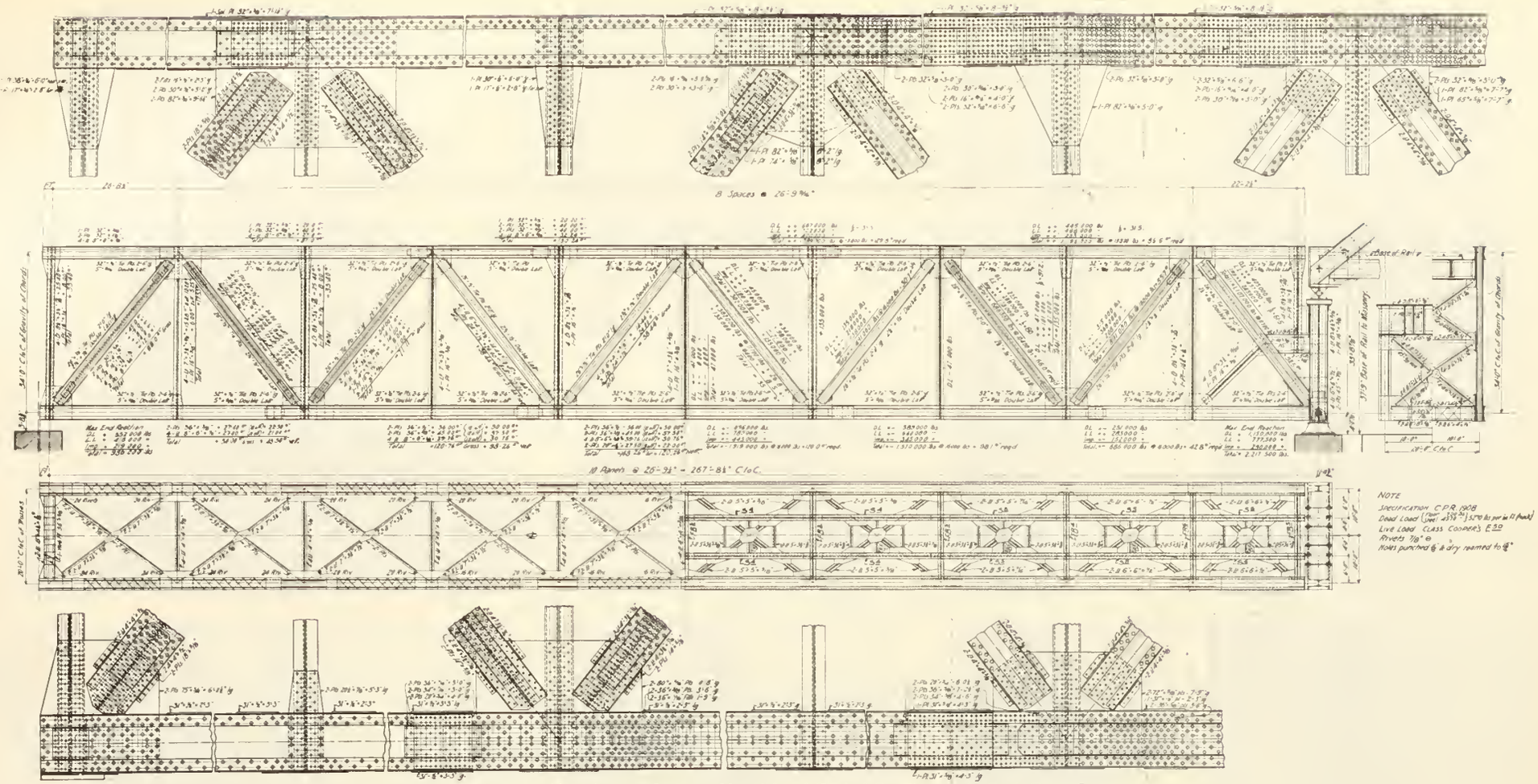
Temporary Wood Blocking on Pier 13 to Receive Span Immediately After Launching. When Two Spans Had Been Landed They Were Jacked Down to Correct Bridge Seat.

The adjustment of the anchor cables was made as required. The time occupied in the floating operations is extremely interesting:—

ACTUAL WEIGHTS. See Plan 1.

3-80	ft. d.p.g. Spans for Double Track.....	613,672 lbs.
8-120	" d. truss spans " " "	3,914,781 lbs.
4-240	" " " " " "	7,710,077 lbs.
2-270	" " " " " "	5,414,681 lbs.
2-400	" thro' truss spans " "	10,291,135 lbs.
2-122	" d. truss spans for " "	518,585 lbs.
Total weight of superstructure.....		28,462,931 lbs.

The total weight of each 408 foot span



Plan 4.—Lachine Bridge, C.P.R. Stresses, Material and Typical Details, 270 ft. Deck Truss Span.

while launching was 1,300 tons. During each of the operations, all the regular trains were allowed to pass on the adjoining spans, which necessitated stopping the floating operations, because the work of signalling and superintendence was interfered with. The difference between the net time and the gross, was occupied in overhauling cables, taking up slack, and in dismantling some of the steelwork connected with the special truck or buggy when it reached the last panel of the 270 ft. span. At this point, it was necessary to remove certain steelwork which became no longer necessary on account of the load being shifted, from a 3 point to a 1 point bearing. A diagram of this buggy is shown on plan 5. The perfection of the control under which the span was at all times, is exemplified by an incident which occurred during one of the floating operations. The span had reached a point 3 ins. short of its correct location, and after the necessary signalling over the intervening distance of nearly 800 ft. the Lidgerwood engine driver made exactly the 3 ins. movement called for, no more and no less. This is remarkable considering the tonnage being handled. As has already been stated, the 408 ft. spans were skidded upon the deck of the adjacent 270 ft. deck spans, and after each pair of the large spans (on one track) were floated into correct location they were at an elevation approximately 12 ft. higher than their permanent levels. This required that they be jacked down to their correct bridge seat levels, which was done by means of 150 ton jacks and blocking, the end floor beams having been designed for this purpose as were also the end cross beams of the 270 ft. spans. The 240 ft. spans were also provided with special end bracing to enable them to be jacked up on the piers, if necessary, during erection. The time occupied in erecting the steel was as follows:—

March, 1911.—Erection started at north end.

May 28, 1911.—New 120 ft. spans moved into upstream alignment replacing old 240 ft. span between piers 6 and 7.

July 6, 1911.—Traffic diverted to downstream track between piers 6 and 7.

Nov. 12, 1911.—New downstream span between piers 10 and 11 slewed over, thereby releasing old spans between piers 7 and 11.

Mar. 31, 1912.—Span 10-11 moved into upstream alignment allowing erection to proceed on downstream spans 10-11.

June 18, 1912.—Span 14-15, and 15-south abutment erected.

July 13, 1912.—Downstream spans 10-11 and 11-12 erected.

Nov. 4, 1912.—Downstream 408 ft. span 13-14 floated.

Nov. 22, 1912.—Downstream 408 ft. span 12-13 floated.

April, 1913.—Started taking down old spans between pier 11 and south abutment.

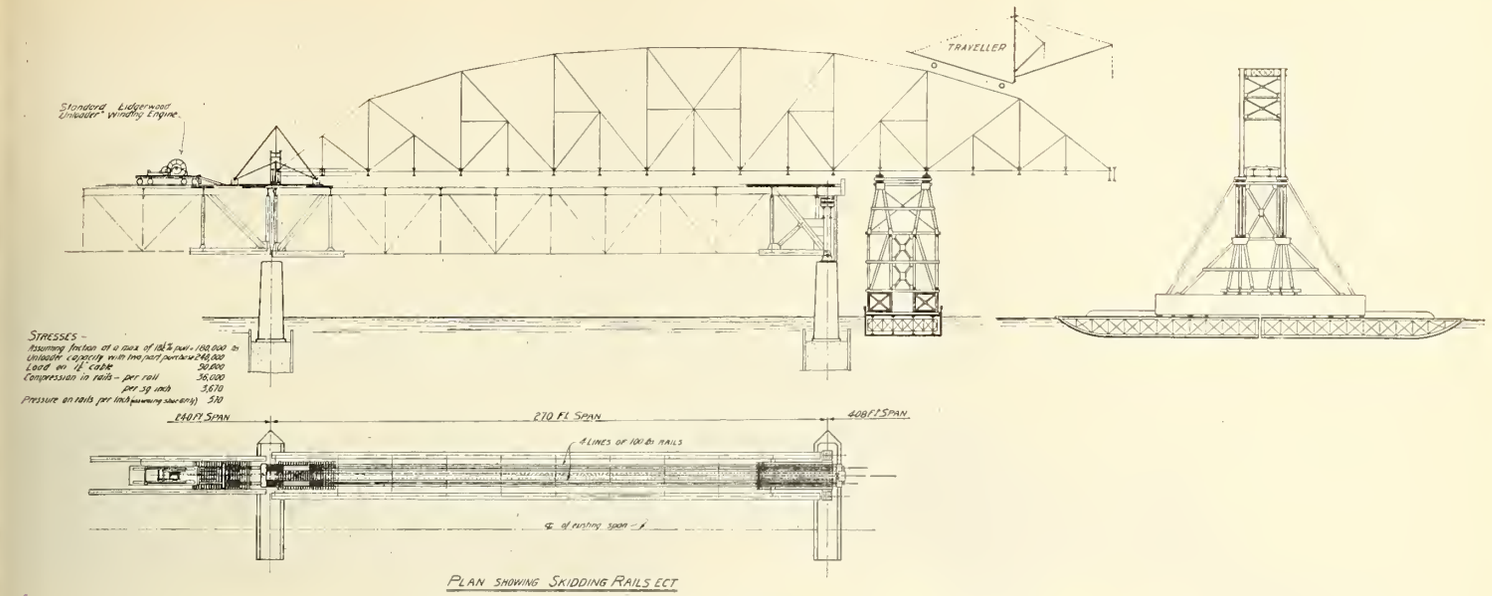
June 10, 1913.—All old steel dismantled.

Sept. 18, 1913.—Upstream 408 ft. span 12-13 floated.

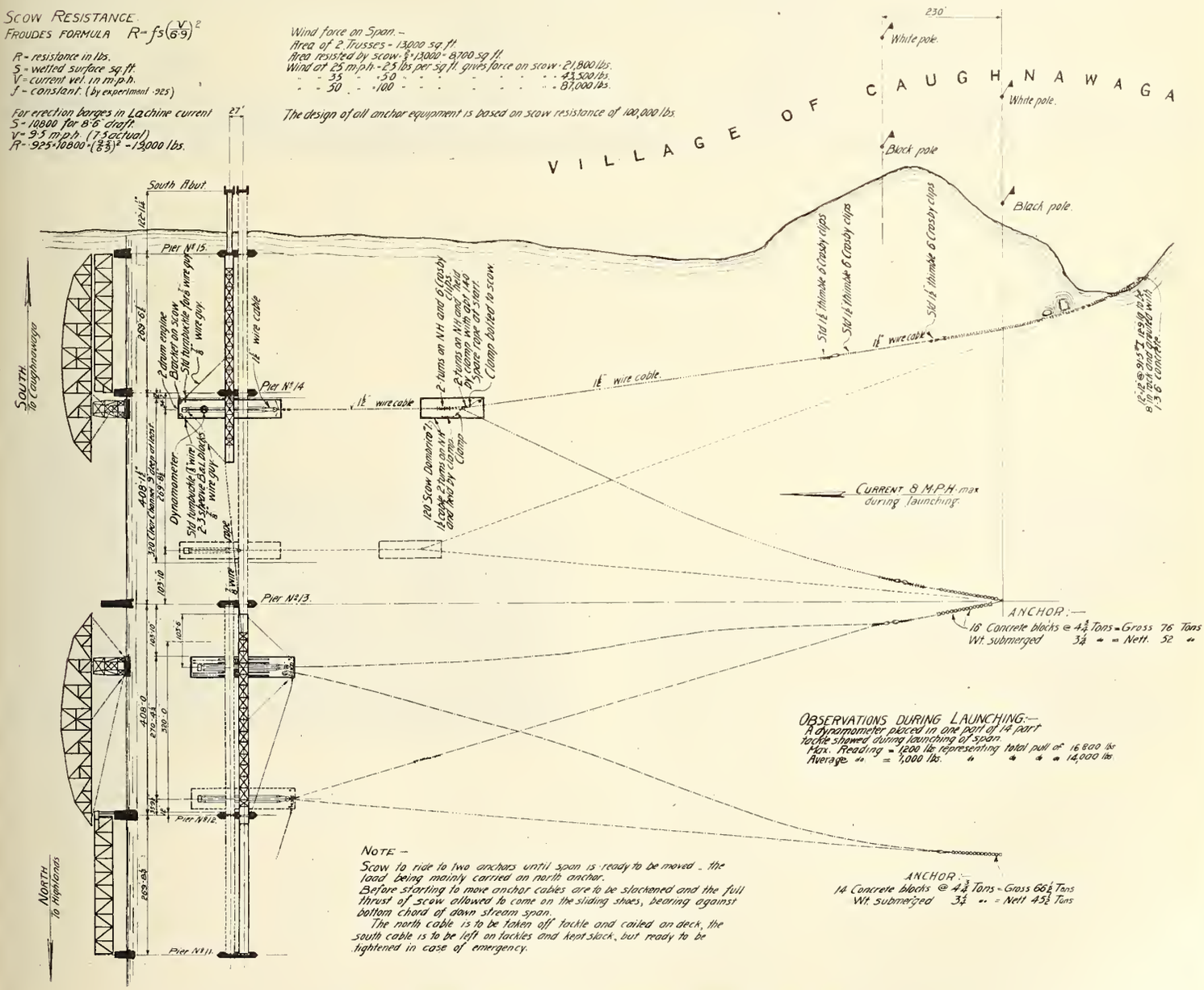
Oct. 6, 1913.—Upstream 408 ft. span 13-14 floated.

Nov. 4, 1913.—All new steel erected and double track put into service.

The total weight of metal work in the old bridge was about 4,100 tons, in the new it was 14,231 tons. The total quantity of masonry and concrete in the original piers and abutments was approximately 12,400 cubic yards. In the additions to old piers and in new piers there were 13,300 cubic yards. The total length of the bridge and height above watermarks were not changed, and are indicated on the plates. The number of rivets in the new bridge is ap-



Plan 5.—Lachine Bridge, C.P.R. Scheme for Launching 400 ft. Span.



Plan 6.—Lachine Bridge, C.P.R. Location of Anchors, Scows, Etc.

proximately 3,500,000. As far as can be ascertained from the records, about 3,500 cars were used in transporting stone and steel to the bridge. These cars would, if placed in a single train, extend over a distance of 21 miles.

One of the noteworthy performances during erection was the speed with which the 5 old spans between pier 11 and the south abutment were dismantled and the new spans erected. This was done between April 22 and Oct. 31, 1913. That is to say, 4,000 tons of steel were handled in six months, or, 666 tons a month, and this without interrupting the railway traffic. During the work, one man was drowned from one of the scows engaged on the substructure and one man was killed in Highlands station yard; but, during the erection of the steelwork over the river proper, there were no fatalities, and only a few minor injuries to men. The cost of the work was slightly under $2,000,000.

In charge for the Foundation Co. were J. W. Doty as Chief Engineer, with W. B. Taylor as Superintendent on the work. For the Dominion Bridge Co. G. H. Duggan was Chief Engineer, and F. P. Shearwood, Jas. Finley and David Bell were in charge of the design, superintendence and erection respectively. For the C. P. R., J. M. R. Fairbairn was Assistant Chief Engineer. C. C. Schneider was connected with the work as Consulting Engineer, and for the design and approval of all detail plans the writer was responsible, as Engineer of Bridges for the C. P. R. Company.

This record of the rebuilding of this work should not be concluded without referring to the place it occupies among the world's more important bridges. At the time of the erection of the first bridge, recently removed, the work was considered a remarkable example of the creative skill of the engineer. Today the old structure, in view of the experience of the last 20 years, would be considered an achievement of only average rank. The new structure is no world's wonder as far as design and details are concerned, but, in view of the fact that there are recorded only a few instances, probably not more than eight, where large spans have been erected by the end launching method, it is worthy of note that the work just completed includes the erection of no less than four large spans by this method, in what may be regarded as record time, and without a mishap of any kind. This is an accomplishment, of which the members of the Canadian Society of Civil Engineers need not be ashamed, and which further goes to show that, while our great profession knows no national bounds, it is not necessary to go outside this country to find men fully qualified to harness the great forces which exist in nature for the use and convenience of man.

The foregoing paper was read before the Canadian Society of Civil Engineers recently.

STRESSES. See Plan 5.

Assuming friction at a maximum of 18½% pull	180,000 lbs.
Unloader capacity with two part purchase	240,000 "
Load on 1½ in. cable	90,000 "
Compression in rails, per rail	36,000 "
" " " per sq. in.	3,670 "
Pressure on rails per inch (assuming shoe 6 ft. lg.)	570 "

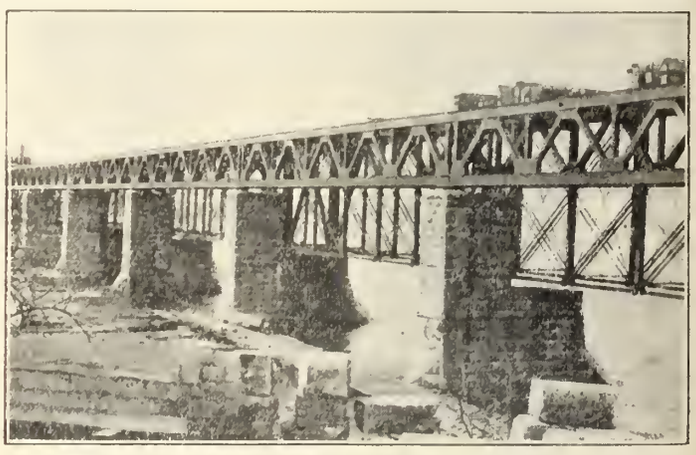
DATA OF CONDITIONS EXISTING DURING LAUNCHING. See Plan 5.

Weights—

Steel in 1-400 ft. span	2,550,000 lbs.	
Floor at 250 lbs. per ft	100,000 "	2,650,000 lbs.
Traveller	80,000 "	
Loading truss & sundries	99,000 "	
Scow reaction—Span	1,765,000 "	
Traveller cantilevered	90,000 "	1,855,000 lbs.
Loading truss reaction—Span	885,000 "	
Truss & sundries	99,000 "	984,000 lbs.
Floor and track on 270 ft. span		
9 panels at 660 lbs. per ft.	165,000 "	
1 " " 800 " " "	20,000 "	185,000 lbs.

Lachine Bridge, C.P.R., from Caughnawaga Shore Shortly Before Completion.

The Old Lachine Bridge from the Caughnawaga Shore.



New and Old Bridges from the Lachine Shore During Reconstruction.

MAXIMUM DISPLACEMENT OF SCOW.

Span	1,855,000 lbs.	
Tare of scow	700,000 "	
False Work.		
Wood	140,000	
Steel pls	10,000	
Girders	240,000	
Sundries	10,000	
	400,000 "	
Engines, boilers, pumps, etc	30,000 "	
Total		2,985,000 lbs.

$$\text{Draught of Scow} = \frac{2{,}985{,}000}{180 \times 37 \times 62.5} = 7 \text{ ft. } 2 \text{ in.} = 84 \text{ ft.}$$

Displacement per inch immersion ..... 35,200 lbs.

National Transcontinental Railway Car Shops at Transcona.

In the first and second instalments of this article, which appeared in the February and March issues, respectively, there were described the following shops and buildings at Transcona, Man.: freight car, passenger car, passenger car paint, paint stores, planing mill, lumber shed, dry kiln, upholstering and nickel plating shops, and the car department offices.

The Wheel and Machine Shop is a standard building, 70 by 160 ft., with concrete lower wall, superimposed by an upper brick wall, and spanned by steel trusses, at 20 ft. centres, which divide the shop crosswise into sections of that width. The lower chord of the steel spans clears the floor by 24 ft. 8 ins. The depth of the roof span at the centre is 7 ft., dropping to 5 ft. at the wall. A 23 ft. wide skylight extends down the centre of the shop, surmounted by a 24 in. copper ventilator over each section, in the peak of the skylight. There are four doors to the building, all 12¾ ft. wide, one in each end and side.

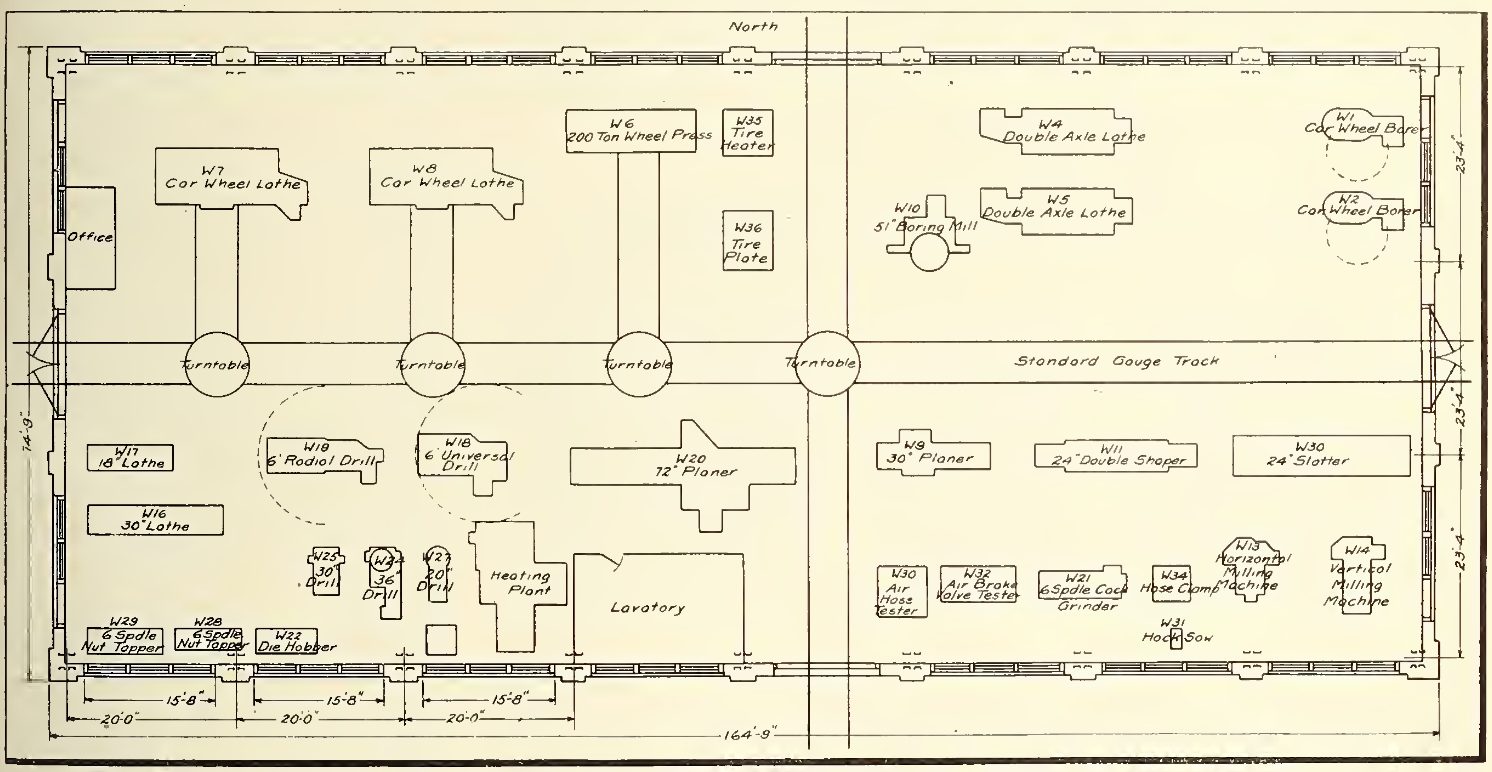


Fig. 10.—Plan and Machinery Location of Wheel and Machine Shop.

The end doors, for the standard gauge entry tracks, on which the raw material is brought into the shop, are double swinging doors. The side doors are of the same size, but slide upward inside the building in balanced ways. The shop is spanned by a 10 ton crane, that runs the length of the shop on crane girders, the rails of which are 17 ft. above the floor level.

Along the south wall, inside the building, is a low structure, 13 by 20 ft., containing the foreman's office, and lavatory facilities. Adjoining this structure on the west is a 9 ft. heating fan, connecting with a concrete heating duct running along that side of the shop, with a line running directly across the shop, and along the other wall. Under each window, midway in each section, there is an 18 in. square grid for heating.

The machinery equipment of the shop is as follows:—

W1 and W2 Car wheel boring machine. To bore wheels up to 42 ins., with 48 in. swing. Table has 5 chuck jaws, 6 changes of speed, power hub facing attachment, and power crane. Equipped with expansion boring bar. Motor driven.

W4 and W5 Double axle lathe, to turn 8 ft. 4 ins. between centres. Hole in revolving head 12 ins. Variable automatic feeds. Equipped with overhead crane. Motor driven.

W6 200 ton hydraulic wheel press. Maximum distance between tie bars, 66 ins. 9 in. ram. Distance between ram and resistance post, 8 ft. Equipped with hoist. Motor driven.

W7 and W8 42 in. steel tire coach wheel lathe. Designed for turning steel tire car wheels from 28 to 42 ins. diameter. Maximum centre, 7½ ft. Equipped with heavy self centring chucks for gripping journals, and 4 jawed chucks to grip tires. Fitted with four sets of bushings, 3¾ by 7 ins., 4¼ by 8 ins., 5 by 9 ins., 5½ by 10 ins., for M.C.B. standard journals. Equipped with automatic gap piece, opened and closed by the movement of the axle in and out of position. Pneumatic tailstock and tool clamping attachments. Wheel lifting device operated by separate motor. Motor driven.

W9 Planer. 8 ft. table. Distance between housings and height under cross rail, 30 ins. Motor driven.

W10 Boring and turning mill. 53 in. swing and 51 in. table. Greatest height under tool holder, 36 ins. Bar travel, 24 ins. Motor driven.

W11 Double traverse head shaper. 12 ft. bed, 36 ins. deep. Motor driven.

W12 Double emery grinder. Wheels, 12 by 2 ins. Motor driven.

W13 Horizontal milling machine. Working table surface, 60 by 18 ins. Longitudinal feed, 40 ins. Cross feed, 14 ins. Greatest height of spindle, 20 ins. Equipped with full set of cutters, and pump. Motor driven.

W14 Vertical milling machine. Working table surface, 60 by 20 ins. Longitudinal feed, 50 ins. Traverse feed, 20 ins. 24 in. circular table, with automatic and cross feeds. Complete set of cutters and lubricant pump. Motor driven.

W16 30 in. heavy standard engine lathe. Maximum 7½ ft. between centres. Motor driven.

W17 18 in. heavy duty engine lathe. Maximum 4 ft. between centres. Taper attachment. Independent 4 jaw chuck. Motor driven.

W18 6 ft. triple geared universal drilling and tapping machine. Drill head of the full swing type, mounted on base that can be revolved from a vertical to horizontal position. Motor driven.

W19 6 ft. strong and powerful radial drilling, boring, tapping and studding machine. High carbon, high tensile strength spindle, accurately ground, truly cylindrical in dead centres, and carried in a large sleeve in which it is firmly supported when out at maximum traverse. Gearing cut from solid. Motor driven.

W20 72 by 72 in. by 16 ft. open side planer. Two heads on cross rail, and one on column. Motor driven.

W21 6 spindle automatic cock grinding machine. Capacity from ½ to 3 in. valves. Spindles independently operated. Handles angle cocks, plug valves, or valves with disc sides. Motor driven.

W22 Die hobbing machine. Equipped with right and left hand die taps from ⅜ to 2 ins. Motor driven.

W23 New Yankee drill grinder. Capacity up to 3½ ins. Complete equipment, including point thinning attachment. Motor driven.

W24 36 in. back geared high duty drill. Capacity for high speed drills up to 2½ ins. in solid steel to their full capacity. Equipped with pump, etc. Motor driven.

W25 30 in. high duty drill. Drive in base of column, and transmitted to spindle by vertical shaft and bevel gears. Working surfaces of compound table, 20 by 36 ins. Motor driven.

W27 20 in. back geared drill. Power and hand feeds. Motor driven.

W28 6 spindle semi-automatic nut tapper. Capacity from ⅜ to 1 in. square or hexagon nuts. Equipped with pump and set of taps. Motor driven.

W29 6 spindle semi-automatic nut tapper. Capacity from ¾ to 1½ in., square or hexagon nuts. Equipped with pump and set of taps. Motor driven.

W30 Geared slotting machine. 36 in. circular table. Motor driven.

W31 Universal power hack saw. Capacity up to 6 in. round bars. Quick return and automatic lifting device. Circulating pump.

W32 Improved triple valve testing machine.

W33 Air hose press machine.

W34 Hose clamping machine.

W35 Tire heater. Capacity up to 36 in. tires.

W36 Tire plate.

W37 Car axle grinding machine. Especially designed for grinding new car axles to standard specifications, and for the repairing of standard car axles. Weight about 23,000 lbs. Motor driven. This machine has not been definitely decided on as yet, owing largely to its cost. All of the foregoing list of machinery is on order, the contracts having been signed some time ago.

A standard gauge track runs the length of the shop, connecting through the front of the shop with the southerly track into the freight car shop, across the midway, over

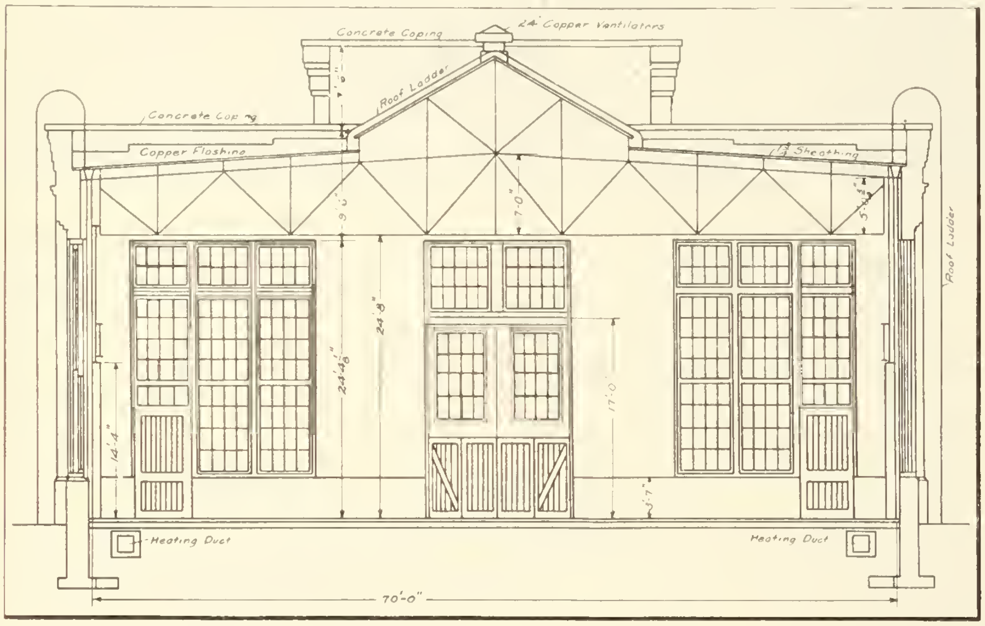


Fig. 11.—Cross Section of Wheel and Machine Shop.

which the mounted wheels can be removed from the shop without trucking. There is no connection from the shop to the rear. At right angles to this through track, there is a track crossing the shop, in one of the central sections, passing through side doors, to the local storage space outside. A central turntable connects the cross tracks. Leading from the lengthwise track, and connecting with it through turntables, there are tracks leading into each of the wheel lathes, and also into the wheel press, making it very convenient for handling the mounted wheels in and out of the machines.

Most of the machinery, it will be observed, is well grouped according to continuity of handling, and so as to minimize the amount of handling between operations. This is especially emphasized by the arrangement along the north side of the shop. At the west end are the wheel lathes for the steel wheel turning. At the other end, are the car wheel borers for the cast iron wheels, with the axle lathes adjoining. Nearly midway in the shop length, is the wheel press for assembling the wheels and axles. The arrangement of the car wheel borers and axle lathes at the east end is capable of extension by the addition of a third unit to each group.

The Forge Shop is 100 by 260 ft., of the usual concrete subwall, brick upper wall, and spanned by steel trusses at 20 ft. centres. It is centrally situated on the east side of the midway between the locomotive and car departments, the locomotive department occupying the greater portion, as reference to the previous article on that department will show. The car department equipment is contained in the north side of the building, principally toward the west end. The 100 ft. truss spans have a clearance above the cinder floor of 24 ft. 8 ins. The central depth of the span is 10 ft., sloping off to a 7 ft. depth at the side walls. Down the centre of the roof, there is a monitor roof, 20 ft. wide, and 10 ft. deep, with a 36 in. cast iron ventilator over each section. With spacious windows in the side and end walls, and the windows along the sides of the roof monitors, the shop is well lighted.

The shop interior is well served by a 2 ft. service track. Through the centre, running lengthwise of the shop, there is a track, with a connection through the centre of the north wall to the outside through that side door. Another service track runs midway down the shop in the section north of the central shop track. This track crosses the north and south track, and also has two other north and south connections as shown, these cross connections passing through the car department forge shop principally, as the work to be handled for the car shop is of a small nature principally, and can be carried away in lots on service track lorries.

The equipment of the forge shop for car department use is as follows:

F1 Automatic feed continuous motion heading machine. Capacity up to 1 in. rivets. Set of dies from ½ to 1 in. Motor driven.

F2 Improved 2½ in. bolt heading, upsetting and forging machine. Dies for bolts from 1 to 2½ ins. by 8ths. To be used for making rivets, hexagon and square head bolts. Motor driven.

F3 1 in. bolt heading, upsetting and forging machine. Capacity for heading up to 1 in. bolts at one blow. Set of dies for ⅜ to 1 in. by 16ths., for square and hexagon head bolts. Steel gear, motor driven.

F4 Bulldozer. Crosshead face, 12 by 63 ins. 20 in. stroke. Motor driven.

F5 100 lb. rubber cushioned hammer. Average blows per minute, 275. Motor driven.

F6 Double end punch and shear. 15 in. throat. To shear 8 by 1¼ in., punch 2½ in. hole in 1⅛ in. plate. Complete with shears and 12 punches and dies from ⅝ to 2 ins. Motor driven.

F7 Quick acting guillotine frame bar shears. 30 ins. wide. Shears for cutting round bars from ½ to 2½ ins. 3 sets of shears. Motor driven.

F8 Special spring stock shear. Guillotine type, with capacity to shear 6 by ⅝ in. block. Motor driven.

F9 2½ in. double bolt cutter. For tapping and threading from ⅝ to 2½ in., right or left. Complete with pump and two sets of right hand and one set of left hand dies from ⅝ to 2½ ins., and one set each of right and left nut taps. Motor driven.

F10 1½ in. triple bolt cutter. For tapping and threading from ⅜ to 1½ ins., right or left. Complete with pump and two sets of right and one set of left hand dies from ⅜ to 1½ ins., and one set of attachments and four dies for threading coach screws ⅜, ½, ⅝ and ¾ in. Motor driven.

F11 1 in. double bolt cutter. For tapping and threading ¼ to 1 in., right or left. Complete with pump and two sets of right hand dies from ¼ to 1 in. Motor driven.

F12 2 in. bolt pointing machine. For pointing bolts and studs from ½ to 2 ins. Complete with pump and cutting tools from ½ to 2 ins. by 8ths. Motor driven.

F13 1½ in. bolt pointing machine. For pointing bolts and studs from ½ to 1½ in. Complete with pump and tools for bolts from ½ to 1½ in. by 8ths. Motor driven.

F14 1in. bolt pointing machine. For pointing bolts and studs from ¼ to 1 in. Complete with set of tools from ¼ to 1 in. Motor driven.

In conjunction with the foregoing machines, there are the following forges:

Continuous rivet furnace. 2 ft. 7 ins. by 16 ft. long, chargeable from either end.

Furnace for bulldozer. 5 by 8 ft. inside.

Furnace for 2½ in. forging machine. 4 by 2 ft. inside.

Furnace for 1 in. forging machine. 4 by 2 ft. inside.

Furnace for rubber cushioned hammer. 4 by 2 ft. inside.

The Nickel Plating and Brass Finishing Shop is situated in the gallery of the locomotive and machine shop, away from the car department buildings. It contains the following equipment:

Nickel plating.
- Buffing machine. Driven from line shaft.
- Buffing machine. For scratch buffing. Driven from line shaft.
- Sand blast machine.
- Plating dynamo. 338 amperes. Driven from line shaft.

Brass finishing.
- Turret lathe. 1 by 10 in. with 6 ft. bed. Driven from line shaft.
- Fox lathe. 6 in. swing, 8 ft. bed. Driven from line shaft.
- Turret lathe. 1 7-16 in., with 6 ft. bed. Driven from line shaft.
- 14 in. shaper. Driven from line shaft.
- 16 in. vertical drill. Driven from line shaft.
- Two buffing wheels. Driven from line shaft.
- Lacquer oven. Suitable size for drying general run of small work.

The Car Department Office is a building similar in size and design to that of the motive power office building, and is situated to the south of the planing mill, back some distance from the midway, a location necessitated by the rearrangement of car department buildings which W. J. Press, Mechanical Engineer, made shortly after

taking hold of the work. In the initial layout, the office faced on the midway, but the present arrangement of shop buildings was considered to be preferable to the former, even at the cost of moving the office back from the midway.

It is a brick structure with steel interior frame, 60 by 68 ft., consisting of two stories and basement. The basement contains the storage and lavatory accommodation. The ground floor has offices for the department's officials and clerks, and on the first floor is the draughting room, file room and blue-

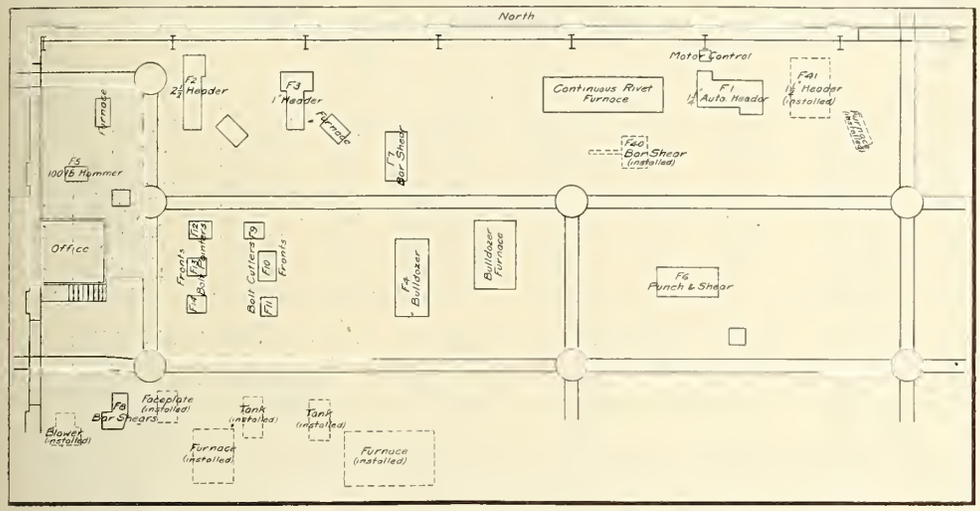


Fig. 12.—Machinery Location of Car Department Section of Blacksmith Shop.

printing room. Vaults are carried up from the basement, with one on each floor.

The floors are of maple on spruce joists, carried on the walls and steel work. The interior is plastered throughout, and the halls and stairs have a wood wainscoting. The building is heated by direct radiation coils and has incandescent electric lighting fixtures.

The G. T. Pacific Ry. has been using the locomotive department buildings for a year, and some of the car department buildings have also been taken over. J. L. Hodgson is Master Car Builder, Grand Trunk Pacific Ry.

The Intercolonial and Canadian Pacific Traffic Agreement.

The agreement in reference to the transportation of C.P.R. passengers and freight over the I.R.C. between Halifax and St. John, in connection with the four C.P.R. and Allan Line steamships carrying British mails and making Halifax the winter port, about which there has been some discussion in Parliament, was entered into Sept. 30, 1913, between F. P. Gutelius, General Manager, Canadian Government Railways, and G. M. Bosworth, Vice President, C.P.R. We are officially advised that it is for the present winter season of navigation only and has to do with one steamship each week. It does not supersede the traffic agreement which has been in force between the I.R.C. and the C.P.R. for some years in regard to traffic between Halifax and St. John. Following is the text of the agreement:—

The following rates will govern the transportation of passengers:—Passengers and their baggage between Halifax and St. John in either direction on special or regular trains, $2 first class and $1.50 second class for each adult passenger, with a maximum earning on this traffic on any one train of $300. When special trains are run they shall handle, if necessary, up to 12 cars, making same time as regular through trains. The C.P.R. to supply a reasonable proportion of the necessary equipment and the Intercolonial to undertake, without charge, such deadhead movements as may be necessary to properly care for the traffic; it being agreed that the C.P.R. will not be asked to hold its cars in Halifax more than seven days at any one time. The I.R.C. will assume the cost to transfer of baggage between cars and shed floor. The I.R.C. will pay the same rental and other charges on cars in this service as at present paid on C.P.R. equipment handled over the line between St. John and Halifax. The C.P.R. shall pay the same charges for cleaning, supplies, etc., as now paid by the I.R.C.

The following rates will govern the transportation of freight:—All classes, in either direction, 75c. a ton of 2,000 lbs., with the exception of flour and grain, which will be carried at 60c. a ton of 2,000 lbs.; the maximum earnings for this traffic on any train to be $300. The C.P.R. will assume the cost of transferring freight between ships and cars at Halifax. All grain handled through the Halifax elevator shall pay the usual elevator charge current at other points. The C.P.R. will assume the clerical work, the checking, waybilling and accounting. The I.R.C. will pay the usual per diem, or other charge on freight car equipment engaged in this business and also all loss or damage which may occur to the freight while in transit between Halifax and St. John.

The I.R.C. will provide the necessary berthing accommodation for the C.P.R. and Allan Line ships and will make no greater charge for wharfage and dockage dues than is charged other steamship lines. This arrangement will remain in effect from Nov. 15, 1913, to May 15, 1914.

To drill chilled cast iron, a contemporary states that the piece should be laid on a forge, the spot to be drilled covered with sulphur and the blast applied slowly until the sulphur is burned off. The chill will then be drawn and the piece can be drilled.

Fuel Consumption on Steam Railways in 1912-1913.

The statistics of fuel consumed on the steam railways for the year ended June 30, 1913, are given in a little more detail than in former years, and show some interesting developments.

The total weight of fuel consumed was 9,263,984 tons, the cost of the same being $28,426,355, against 7,783,736 tons, costing $24,180,823 in the previous year. Distributed among the different classes of locomotives the consumption was:

	1912-13. Tons.	1911-12. Tons.
Freight	5,361,839	4,480,042
Passenger	2,249,320	1,983,238
Mixed trains	502,631	407,970
Switching	1,138,531	890,650
Construction	11,663	21,150
Total	9,263,984	7,783,736

The cost of fuel for road locomotives was $25,089,445, and for yard locomotives, $3,336,910. The average cost of fuel was $3.07 a ton, against $3.15 a ton in 1911-12. This calculation, however, is subject to qualification. In 1912-13 there were 31,078,252 gallons of oil used, against 1,729,577 gallons in 1911-12. The coal equivalent for oil has not been definitely determined, and there is a slight confusion in the returns for that reason. The bringing of oil into use as a fuel on a relatively large scale within recent years will inevitably lead to an early recasting of the fuel accounts. The following table gives the quantities of each class of fuel used by the different classes of locomotives, and the mileage run:

	Per 100 Miles. Consumption. Tons.	Cost. $ c.
Freight	8.31	25 51
Passenger	4.89	15 01
Mixed trains	5.59	17 16
Switching	4.47	13 72
Construction	5.46	16 76

The average weight of fuel used by each class of locomotive, and the cost of the same per 100 miles run are given in the following table:

Class of Locomotives	Coal. Anthracite.	Coal. Bituminous	Wood. Hard.	Wood. Soft.	Other Fuel. Oil.	Other Fuel. Charcoal.	Total.	Miles Run.
	Tons.	Tons	Cords	Cords.	Gallons.	Bushels.	Tons.	
Freight	1,208	5,223,973	463	21,057	20,153,877	70,562	5,361,839	64,541,731
Passenger	754	2,186,069	470	10,758	9,103,495	55,120	2,249,320	40,926,357
Mixed train	1,465	494,547	68	3,2 8	489,720	4,597	502,631	8,981,330
Switching	1,235	1,124,857	....	5,591	1,320,382	27,070	1,138,531	25,456,533
Special	.....	11,517	....	33	19,778	179	11,633	213,770
Total	4,662	9,040,963	1,001	40,647	31,087,252	157,528	9,263,984	145,119,721

Note: One and one half cords hard wood equal one ton. Two cords soft wood equal one ton.

The American Railway Engineering Association's annual convention was held at Chicago, Ill., Mar. 17-20. The committee reports dealt with included those on rules and organization, signals and interlocking, yards and terminals, roadway, wooden bridges and trestles, iron and steel structures, masonry, track, electricity, wood preservation, grading of lumber, water service, buildings, rail, ties, signs, fences and crossings, conservation of natural resources, economics of railway location, uniform general contract forms, records and accounts, and ballast.

Viaducts Over Great Northern Ry. at Vancouver.—The Vancouver, B.C., City Council has let the contract to the Union Contracting Co. for the erection of what is known as the east end viaducts over the G. N. Ry., at a cost of $304,936. Four viaducts are to be built, viz., at Hastings, Pender, Keefer and Harris Streets, and the company is to lower its tracks so as to permit of the elimination of the level crossings at these points.

Steam Railway Statistics for Year Ended June 30, 1913.

The table given in our last issue showed the financial results of the operations of steam railways for the year ended June 30, 1913. The following table gives the percentages and the principal statistical information compiled by the companies. The table published last issue and the one given below contain all the information given prior to 1910 in our compilation of these statistics, but the columns have been rearranged so as to combine in the first table the financial and in the second the statistical information:—

Name of Railway	Proportion of total Passenger service train revenue to total earnings	Proportion of freight revenue plus switching revenue, &c., to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
Algoma Central & Hudson Bay	9.23	53.38	143,384	13,823	$3.75	35,355	1,609,520	$0.63	395,537	16,451,300	$4.02
Algoma Eastern	2.71	91.41	24,647	3,403	5.22	8,403	95,547	.26	614,661	5,462,517	4.94
Atlantic, Quebec & Western	57.29	42.61	83,645	4,985	.50	23,181	807,316	.39	18,305	618,298	.80
Bay of Quinte	18.26	77.77	237,288	.....	1.08	107,606	1,545,952	.24	280,880	10,980,236	.84
Bedlington and Nelson	15.05	84.85	1,754	316	1.22	1,289	9,013	.18	2,116	14,815	1.04
Brandon, Sask. & Hudson Bay	40.90	58.82	68,118	2,156	1.11	28,084	956,392	.71	77,333	3,271,119	1.83
British Yukon	20.94	77.98	78,125	1,507	4.17	8,206	674,572	1.09	61,964	5,555,965	3.36
Brockville, Westport & N. W.	50.47	49.39	58,935	295	1.29	70,061	2,101,830	.67	41,554	1,371,282	1.29
Canada and Gulf Terminal	44.79	53.91	24,264	.....	1.73	28,764	575,280	.77	20,759	415,180	.93
Canadian Government Railways											
Intercolonial	32.69	66.45	8,341,963	305,004	1.48	3,867,735	207,505,697	1.17	5,316,461	1,424,519,501	1.56
Prince Edward Island	50.76	46.25	363,801	29,142	1.07	436,833	9,794,121	.55	122,714	4,586,905	.84
Canada Southern	31.62	67.94	3,875,213	79,447	2.83	1,422,657	122,958,793	1.77	8,588,037	1,244,337,112	3.61
Canadian Northern	17.95	76.48	9,212,339	505,669	2.63	1,984,978	157,225,910	1.27	6,821,811	2,366,393,799	2.83
Canadian Northern Ontario	29.34	68.06	913,081	47,221	1.40	374,877	16,602,410	.70	1,014,110	103,038,325	1.78
Canadian Northern Quebec	25.30	72.55	764,527	18,124	2.09	620,753	20,785,443	.92	1,043,531	94,725,724	2.45
Canadian Pacific	30.27	67.88	51,904,291	2,253,186	2.51	15,298,048	1,766,982,013	1.63	29,471,814	11,242,600,998	3.00
Cape Breton	52.74	42.03	19,592	.....	.57	8,805	193,678	.30	5,409	90,170	.24
Caraquet	30.12	69.88	49,635	.....	1.47	17,387	712,377	.44	34,960	1,398,400	1.03
Central Ontario	31.44	64.48	318,720	8,950	1.17	203,451	3,977,166	.51	294,244	10,252,674	1.77
Crow's Nest Southern	10.72	89.29	102,557	4,881	2.21	22,807	557,688	.53	282,298	14,445,599	3.56
Cumberland	16.44	83.28	48,665	.....	2.27	44,797	463,194	.63	366,489	5,281,000	1.89
Dominion Atlantic	44.32	54.58	612,019	47,019	1.60	411,418	18,308,101	.87	367,879	20,258,699	1.75
Eastern British Columbia	8.08	91.70	7,814	120	6.98	7,683	76,600	.57	163,869	1,533,712	6.47
Elgin and Havelock	29.00	69.54	17,256	.....	.78	11,096	299,457	.22	12,178	308,706	.54
Esquimalt & Nanaimo	38.90	58.92	275,575	34,039	3.38	446,034	10,085,054	2.58	478,570	17,576,036	3.87
Essex Terminal	.....	96.14	20,900	.....	2.28	.....	.....	.....	161,874	809,370	2.19
Grand Trunk	33.45	65.40	20,221,257	964,678	1.99	12,174,924	626,203,301	1.52	21,041,806	3,758,487,790	2.23
G. T. R. (Canada Atlantic)	23.00	75.06	1,693,431	97,778	1.40	614,829	20,242,100	.69	1,928,864	243,023,658	1.74
Grand Trunk Pacific	19.65	78.54	3,743,120	763,268	2.18	551,620	66,006,086	1.02	1,561,437	816,646,434	2.54
Halifax and South-Western	46.29	52.98	411,379	11,914	1.29	228,806	7,624,064	.68	295,077	16,038,266	.88
Hereford	23.78	75.11	87,239	2,346	1.02	34,998	797,094	.31	137,532	3,309,127	1.25
International of New Brunswick	37.72	61.76	124,042	5,389	.90	32,143	1,443,257	.40	106,632	4,264,173	1.26
Inverness Ry. and Coal Co.	10.99	88.48	111,462	.....	1.91	37,078	836,425	.54	302,732	17,782,674	1.69
Irondale, Bancroft & Ottawa	31.68	66.52	34,980	.....	.86	17,346	299,259	.27	26,829	626,638	.57
Kent Northern	41.48	58.52	16,902	.....	1.30	9,000	180,000	.51	11,541	230,830	.76
Kettle Valley	15.67	84.33	2,300	.....	1.50	781	14,029	.23	2,637	34,061	1.27
Kingston and Pembroke	30.62	71.99	81,542	.....	1.64	58,669	1,701,401	.53	88,860	4,175,420	1.97
Klondike Mines	.....	99.99	14,186	.....	1.76	2	26	.....	44,400	495,594	7.76
London & Port Stanley	26.15	73.29	127,240	800	1.15	161,501	2,360,279	.47	642,920	9,875,390	1.72
Lotbiniere & Megantic	17.77	82.16	18,960	.....	1.83	12,678	186,934	.32	51,912	702,753	1.52
Maine Central	66.34	33.66	14,613	281	1.26	124,806	636,511	1.18	188,942	963,604	.57
Manitoba Great Northern	10.99	88.47	42,752	11,839	1.55	10,121	225,604	.22	98,815	5,263,465	1.14
Maritime Coal Ry. & Power Co	11.20	88.80	26,354	5,581	2.58	22,280	208,661	.49	209,067	2,257,813	2.29
Massawippi Valley	26.86	72.67	209,416	70	1.26	152,825	2,815,645	.72	734,025	22,907,778	1.73
Midland Ry. of Manitoba	43.88	52.54	181,446	266	2.57	123,749	8,097,755	1.76	227,302	16,219,042	3.76
Moncton and Buctouche	39.32	58.47	23,232	.....	1.32	25,612	534,318	.52	23,588	469,567	.77
Montreal and Atlantic	21.49	76.52	666,377	18,025	1.65	363,499	8,756,192	.77	1,369,462	71,224,193	1.72
Montreal and Province Line	53.95	44.68	99,396	12,035	1.45	250,656	3,661,262	1.08	100,012	2,632,985	1.51
Montreal and Vermont	52.38	47.53	101,548	2,088	1.26	122,755	2,520,990	1.02	390,604	8,622,702	1.72
Morrissey, Fernie & Michel	7.73	92.27	41,626	.....	3.66	150,600	918,660	.29	851,758	5,195,723	3.37
Napierville Jct	6.34	93.53	32,442	.....	3.11	17,652	218,374	.37	410,729	11,597,532	2.91
Nelson & Fort Sheppard	35.19	61.24	57,024	11,237	1.45	21,913	683,699	.77	31,112	1,284,568	2.60
New Brunswick Coal & Ry. Co.	21.22	65.90	57,138	.....	1.07	20,908	426,532	.22	68,370	2,973,170	.70
New Brunswick & P. E. I.	29.30	70.52	56,810	.....	.76	22,292	601,570	.50	49,793	796,688	.59
New Westminster Southern	20.60	72.34	20,720	16	2.79	20,696	238,811	.57	63,303	839,988	2.01
North Shore	20.12	79.88	4,800	.....	.49	1,671	13,368	.08	3,930	31,440	.32
Ottawa and New York	40.48	56.99	153,485	17,387	1.42	147,822	3,783,993	1.10	323,163	14,556,986	1.68
Pere Marquette	7.20	90.58	1,136,229	3,196	2.36	377,936	7,492,358	.70	2,881,897	445,513,342	2.89
Quebec Central	27.97	71.17	858,165	263,927	1.83	418,482	18,168,457	.89	1,105,011	89,238,653	3.36
Quebec & Lake St. John	32.55	65.82	558,899	6,663	1.71	405,896	13,622,264	1.27	540,351	47,340,978	1.75
Quebec, Montreal & Southern	40.86	58.94	273,215	1,953	1.44	265,142	5,998,116	.76	462,418	19,614,272	1.59
Quebec Oriental	48.26	51.69	120,093	5,567	.84	27,249	1,781,213	.77	42,074	2,906,201	.92
Quebec Ry., Light & Power Co.	15.91	82.89	30,805	5,062	2.66	115,364	1,384,368	1.97	193,075	1,668,176	2.81
Red Mountain	17.32	80.63	8,812	245	1.94	7,296	65,321	.45	22,812	196,898	1.56
Rutland and Noyan	62.57	37.43	7,856	.....	1.85	128,741	436,432	1.67	336,889	1,142,054	2.25
Salisbury and Albert	32.77	65.43	31,587	.....	1.17	16,100	356,368	.38	47,489	1,020,030	.76
Schomberg and Aurora	45.51	54.32	23,197	.....	.57	20,546	200,734	.26	10,863	108,630	.31
Stanstead, Shefford & Chambly	43.77	54.02	85,069	11,393	1.23	183,523	1,307,419	.74	414,512	2,127,092	1.39
St. Clair Tunnel	.....	100.00	.....	.....	.....	.....	.....	.....	.....	.....	.....

(Continued on page 161)

Steam Railway Statistics for Year Ended June 30, 1913 (Continued from page 160).

Name of Railway	Proportion of total Passenger train revenue to total earnings	Proportion of freight revenue plus switching revenue, &c., to total earnings	Revenue Train Mileage	Mileage of Non Revenue Trains	Earnings per Train Mile	Passengers Carried	Passengers Carried One Mile	Passenger Earnings per Train Mile	Tons of Freight Carried	Tons of Freight Carried One Mile	Freight Earnings per Train Mile
St. Lawrence & Adirondack	39.94	59.34	342,445	8,070	1.99	656,322	14,983,927	1.27	1,046,271	38,967,540	3.15
St. Martins	42.19	55.51	17,640	.....	.82	10,463	204,136	.35	12,458	185,150	.46
Sydney and Louisburg	6.14	91.36	279,676	.....	2.92	156,599	1,767,477	1.17	4,911,053	69,382,774	2.91
Temiscouata	25.41	72.41	156,970	12,266	1.59	73,015	2,313,809	.44	187,553	8,131,193	2.18
Timiskaming and Northern Ont	39.71	56.48	882,241	63,759	1.77	498,041	22,750,448	1.24	650,247	75,111,559	1.92
Thousand Islands	32.20	62.40	32,604	.....	1.41	51,496	308,976	.45	45,770	274,620	.88
Toronto, Hamilton & Buffalo	24.56	74.37	491,738	17,084	3.71	654,116	19,057,320	1.48	2,788,028	108,735,895	7.36
Vancouver, Victoria & Eastern	28.38	69.11	343,287	135,045	2.89	295,867	8,210,728	1.19	1,447,789	41,721,730	3.44
Victoria and Sidney	48.38	49.18	31,898	.....	2.47	123,599	1,347,529	1.76	45,282	620,317	3.61
Victoria Terminal Ry. & Ferry Co	47.32	42.18	1,987	.....	3.36	118,899	117,710	2.34	43,732	43,295	4.26
Wabash (in Canada)	25.99	73.80	1,638,852	53,197	1.58	586,841	35,768,226	.92	2,019,027	438,916,279	2.08
Wellington Colliery Co	5.74	94.26	30,000	.....	2.80	8,536	91,761	.16	278,542	2,947,435	2.64
York and Carleton	34.80	65.20	8,597	.....	.68	6,156	61,560	.23	13,018	130,180	.44
	28.99	68.98	113,437,208	5,837,310	.....	46,185,968	3,265,192,886	.....	106,992,710	23,032,951,596	.....

Birthdays of Transportation Men in April.

Many happy returns of the day to:—

F. G. Adams, Division Freight Agent, Grand Trunk Pacific Ry., Edmonton, Alta., born at St. John's, Nfld., Apr. 6, 1878.

W. H. Ardley, General Auditor, G. T. R., Montreal, born at London, Eng., Apr. 24, 1858.

Jas. Black, Freight Claim Agent, C. P. R., Vancouver, B. C., born near Seaforth, Ont., Apr. 19, 1858.

C. G. Bowker, General Superintendent, Eastern Lines, G. T. R., Montreal, born at Medford, N. J., Apr. 21, 1871.

S. P. Brown, M. Am. Soc. C. E., M. Am. Soc. M. E., Chief Engineer, Mount Royal Tunnel and Terminal Co., Montreal, born at Dover, Me., Apr. 29, 1877.

W. J. Camp, Assistant Manager Telegraphs, C. P. R., Montreal, born at Oakville, Ont., Apr. 22, 1855.

G. Cobb, Superintendent, Reid Newfoundland Co., St. John's, Nfld., born at Coupar Angus, Scotland, Apr. 21, 1885.

A. V. Collins, Canada Steamship Lines, Ltd., Toronto, born at Island Pond, Vt., Apr. 21, 1868.

J. E. Crossley, Travelling Passenger Agent, G. T. R., Montreal, born at Keighley, Eng., Apr. 14, 1879.

W. A. Duff, A. M. Can. Soc. C. E., Engineer of Bridges, Intercolonial Ry., Moncton, N. B., born at Hamilton, Ont., Apr. 20, 1877.

A. E. Edmonds, District Passenger Agent, C. P. R., Detroit, Mich., born at Woodstock, Ont., Apr. 8, 1866.

B. C. Gesner, Moncton, N. B., formerly Air Brake Inspector, I. R. C., now Eastern Sales Agent, Galena Signal Oil Co., born at Cornwallis, N. S., April 23, 1850.

J. Murray Gibbon, General Publicity Agent, C. P. R., Montreal, born at Udewella, Ceylon, Apr. 12, 1875.

V. A. Harshaw, Superintendent, District 1, Atlantic Division, C. P. R., Brownville Jct., Me., born at Mono, Ont., Apr. 26, 1865.

A Hatton, Superintendent of Car Service, Western Lines, C. P. R., Winnipeg, born at London, Eng., Apr. 12, 1869.

J. M. Horn, District Freight Agent, Canadian Northern Ry., Edmonton, Alta., born at Allanton Mills, Lanarkshire, Scotland, Apr. 12, 1880.

B. S. Jenkins, ex General Superintendent, C. P. R. Telegraphs, Winnipeg, born Apr. 8, 1859.

J. H. Johnston, Superintendent of Bridges and Buildings, Eastern Lines, G. T. R., Montreal, born at Uxbridge, Ont., Apr. 22, 1860.

J. Kyle, Master Mechanic, Western Division, Canadian Northern Ry., Edmonton, Alta., born at Toronto, Apr. 11, 1877.

D. McNicoll, Vice President, C. P. R., Montreal, born at Arbroath, Scotland, Apr. 7, 1852.

P. Mooney, General Freight and Passenger Agent, Halifax and South Western Ry., Halifax, N. S., born at St. Catherines, Que., April 19, 1871.

J. O. Norrie, Travelling Passenger Agent, Cunard Steamship Co., Winnipeg, born at Belfast, Ireland, Apr. 20, 1879.

G. D. Perry, General Manager, Great North Western Telegraph Co., Toronto, born at Whitby, Ont., April 19, 1858.

R. A. Pyne, Superintendent of Shops, C. P. R., Winnipeg, born at Toronto, April 10, 1874.

R. S. Richardson, Assistant Superintendent, Intercolonial Ry., Moncton, N. B., born at Napanee, Ont., April 9, 1865.

F. Rioux, Assistant to President, Reid Newfoundland Co., St. John's, Nfld., born at Trois Pistoles, Que., Apr. 18, 1867.

W. A. Ritchie, District Superintendent, Pullman Co., Montreal, born at Edinburgh, Scotland, Apr. 13, 1854.

E. W. Smith, Superintendent, Dining and Parlor Car Service, G. T. R., Toronto, born at North Bridge, Mass., Apr. 21, 1869.

W. S. Tilston, Chief of Montreal Board of Trade Transportation Bureau, born at Manchester, Eng., Apr. 14, 1877.

W. Wainwright, Vice President, G. T. R., and G. T. P. R., Montreal, born at Manchester, Eng., Apr. 30, 1840.

W. Woollatt, Walkerville, Ont., ex-General Superintendent, Buffalo Division, Pere Marquette Rd., born at Weedon, Hertfordshire, Eng., Apr. 2, 1855.

H. J. White, General Car Foreman, Canadian Northern Quebec Ry., and Quebec and Lake St. John Ry., Joliette, Que., born at Brownington, Vt., Apr. 1, 1871.

For gas coal, a smaller grate than normal may be used, but it is better practice a sufficient volume of forebox for proper portion of the front end in order to obtain combustion because nearly all large modern locomotives are deficient in firebox volume.

The most desirable proportion of boiler capacity to aim for is 100%, but if it is to use the larger grate, and brick off a in excess of this, it is optional whether the cylinder proportions should not be increased and the factor of adhesion reduced, provided there is sufficient weight on the drivers.

Regulations Regarding Conduct of Government Railways Employes.

An order in council has been passed respecting the general conduct of those engaged on the Canadian Government Railways, as follows:—

To enter or remain in the service is an assurance of willingness to obey the rules;

Obedience to the rules is essential to the safety of passengers and employes, and to the protection of property;

The service demands the faithful, intelligent and courteous discharge of duty;

To obtain promotion, capacity must be shown for greater responsibility;

Employes in accepting employment assume its risks;

The use of intoxicants by employes while on duty is prohibited; the use or the frequenting of places where intoxicants are sold is sufficient cause for dismissal;

The use of tobacco by employes while on duty in or about passenger stations, or on passenger cars, is prohibited;

Employes must always be vigilant to protect, and must promptly report anything detrimental to, the railways' interest.

Railways in Alaska.—The United States Senate has passed an act authorizing the President to arrange for the building of 1,000 miles of railway in Alaska at a cost not exceeding $40,000,000. The railway is to be from tidewater to the interior of Alaska. In deciding upon the route the President may arrange for the purchase of any existing line, or of any line partially constructed, and is authorized to utilize in the building of the line any of the plant recently used on the Panama Canal. The suggestion is that a line be built from Seward or other point right across Alaska to the Yukon River near Dawson, and that the partially constructed line of the Alaska Central Ry., which the Sovereign Bank, Toronto, now in liquidation, was interested in as the principal bondholder, should be acquired as part of the line.

Railway Lands Patented.—Letters patent were issued during January, covering railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Alberta Central Ry.	3.33
Calgary and Edmonton Ry.	2,233.27
Canadian Northern Ry.	2,303.13
Canadian Pacific Ry.	160.00
Grand Trunk Pacific Branch Lines Co.	27.96
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	2,569.93
Total	7,297.622

Railway Mechanical Methods and Devices.

Shop Kinks Used on the Canadian Northern Railway.

The accompanying illustrations show several shops kinks used at different points on the Canadian Northern Ry., which have been compiled by H. Ashton, Chief Inspector of New Equipment.

A machine shop crane for serving 90 in. driving wheel lathes in locomotive house machine shops, is shown in fig. 1. It is built up of structural steel, the columns being composed of two 10 in., 15 lb. channels, covered with two ⅜ by 10 in. plates, carried on concrete piers. It is tied together laterally by a 4 in. I beam at each end, and longitudinally, by two 7 in., 15 lb. I beams, on each side, covered top and bottom with a ⅜ by 10 in. plate, these beams each carrying a 60 lb. rail for the crane runway. Each corner is braced longitudinally by a 5 by ¾ in. steel brace. The crane span is 13 ft., and the run 22½ ft. The crane is a 10 in. 40 lb. I beam, carried on four wheels. and is moved the length of the runway by a hand chain. A cross carriage on the crane girder carries a 6 ton air hoist. The span is sufficient to include the narrow gauge track from the locomotive house. It is also used for handling running gear, locomotive trucks and tender trucks. The vertical lift is 5 ft.

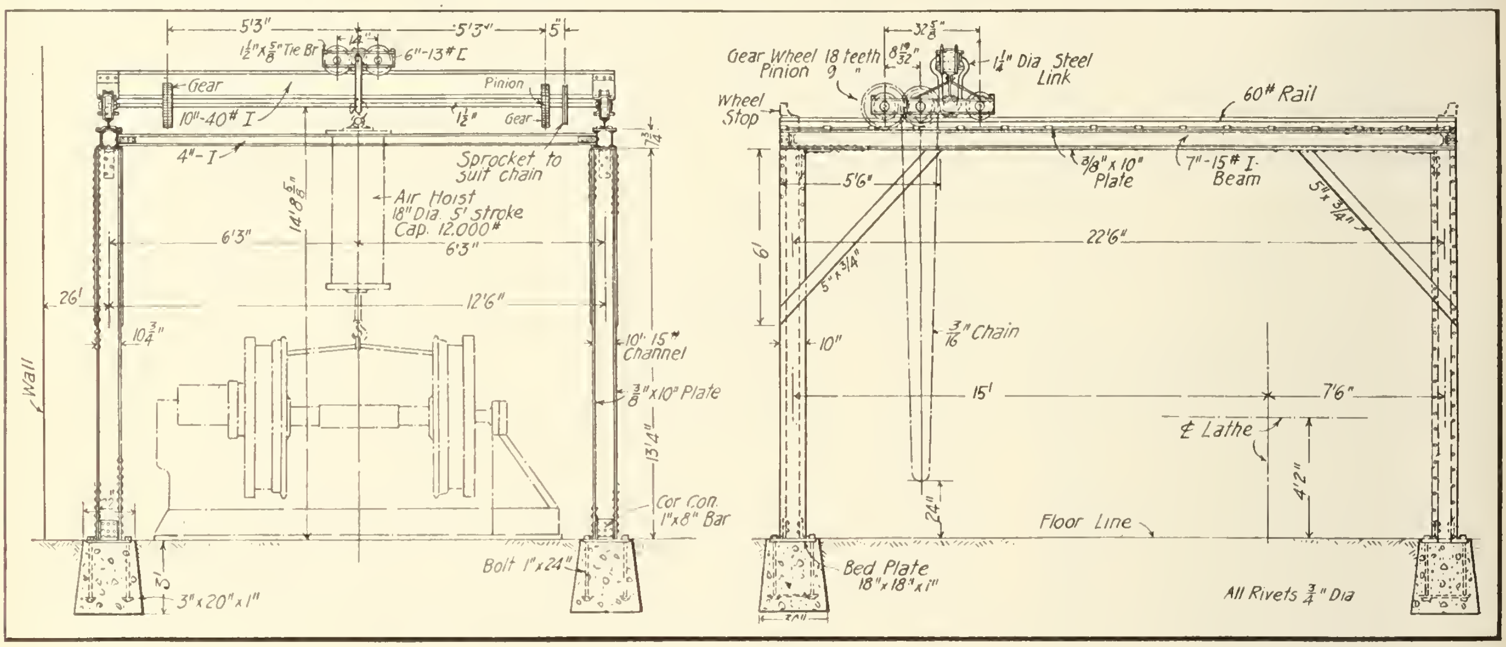


Fig 1.—C.N.R. Locomotive House Machine Shop Crane for Wheel Lathe.

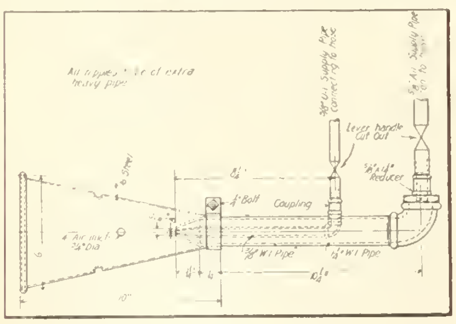


Fig. 2.—C.N.R. Oil Heater for Firebox Patches.

An oil heater for small work, such as fitting mudring corners and heating firebox patches, is shown in fig. 2. The principal feature of difference between it and the usual type of oil heater, lies in the fact that it is so made up that it is practically integral from the oil and air connections to the heater tip, precluding any difficulty from the parts being accidentally parted while in use. The body of the heater comprises a short length of ⅜ in. pipe inside a slightly longer length of 1¼ in. pipe, both tapering to a fine nozzle at the same point. The inner pipe has a ⅜ in. oil connection, and the outer one, a ⅝ in. air connection, with its own control valve, close to the body of the heater. A sheet iron hood is attached to the tip end, to concentrate the blast. The joint between the pipe and the casing of the boiler is tightly packed with asbestos.

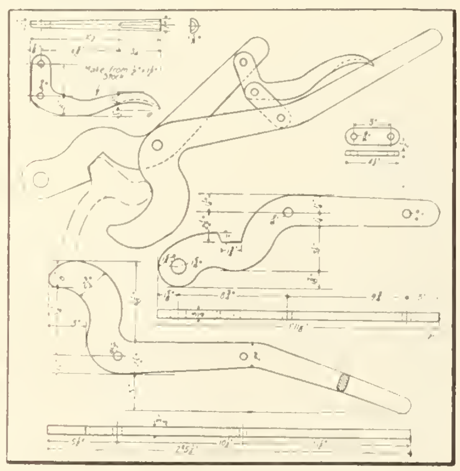


Fig. 3.—C.N.R. Wheel Tongs.

The wheel tongs, shown in fig. 3, are in somewhat general use, several wheel and foundry companies using them in addition to the C.N.R. They are plain tongs, with the added feature of the locking device on the handle, which consists of two links, one of which is a bell crank, pinned to the handle, the pressing of the bell crank to the other handle causing the links to slip past centre, locking the tongs closed.

A paint sprayer of useful design is shown in fig. 4. It comprises a copper cylinder, 7 ins. diameter and 7½ ins. long, with a filler hole in top, and a ⅜ in. discharge pipe connection running down inside the cylinder to near the bottom, connecting at the top with a nozzle, which partakes of the nature of an injector, the compressed air passing up through a pipe handle, spraying the paint through the nozzle on the work. It connects to the regular 90 lb. shop air line.

A novel design for a combination gauge for checking the contour of bearing wedges and brasses, is shown in fig. 5. All the inspectors on the C.N.R. are supplied with these, and have found them most useful. The gauge to the left is for the wedges, and that to the right for the brasses, the lower face for determining the wedge fit, and the upper face, the journal fit.

Mounting Air Hose.—A large number of different machines are in use for mounting air hose, several of which have been described from time to time in Canadian Railway and Marine World. A slightly different scheme is used in the C.N.R. shops, shown in fig. 6, and which, like most hose machines, is an improvised device. This model was finally decided on after the different types had been carefully considered. It has the advantage of requiring but small space, and needs but little material that cannot be found around any railway shop. The device consists of a four cylinder arrangement, two vertical and two horizontal, the upper vertical one for clamping the hose, the lower vertical one for squeezing the end clamp rings, and the horizontal cylinders for forcing in the end connecting pieces. On the supporting bench there are two formed blocks attached, in which the

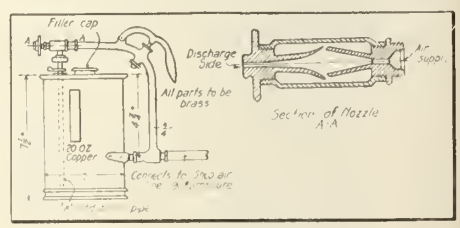


Fig. 4.—C.N.R. Car Paint Sprayer.

hose to be fitted is placed, the latter being clamped securely in place by similar blocks attached to the end of an equal arm lever suspended from the piston of the upper air cylinder, as shown in the detail view. The operation of this upper cylinder clamps the hose in place. The centre of the hose clamp blocks and the end cylinders are concentric, and in the heads of the piston rods there are receptacles for receiving the hose fittings. The inward movement of the pistons of these end cylinders forces the fittings into the stationary hose. Prior to this operation the clamping bands are slipped over the ends of the hose. The vertical cylinder beneath the table has another equal arm lever attached to the end of the piston rod, and to the outer end of the lever there are attached the lower ends of a pincer arrangement at each end of the hose. These pincers are fulcrumed at the level of the upper surface of the table, and fit over the hose clamps, the depression of the lower cylinder causing the pincers to close, tightening up on the hose clamps, the holding bolts for which can then be applied and tightened up before the release of the cylinders. This arrangement is very flexible, as varying lengths of hose may be handled in the same machine, taking up the difference in length by varying the piston travel of the horizontal cylinders, or shifting their location on the table. As the C.N.R. uses only 22 in. hose, this is unnecessary. A set of 1, 1⅜ and 1½ in. blocks for these sizes of hose is necessary with the machine. The principal feature of merit in this device lies in the operation developed by the lower cylinder, which is an old 8 in. air brake cylinder. This has a maximum travel of 3 ins., brought about by reducing the regular spring by 8 ins. This article has been compiled from one in the Railway Master Mechanic.

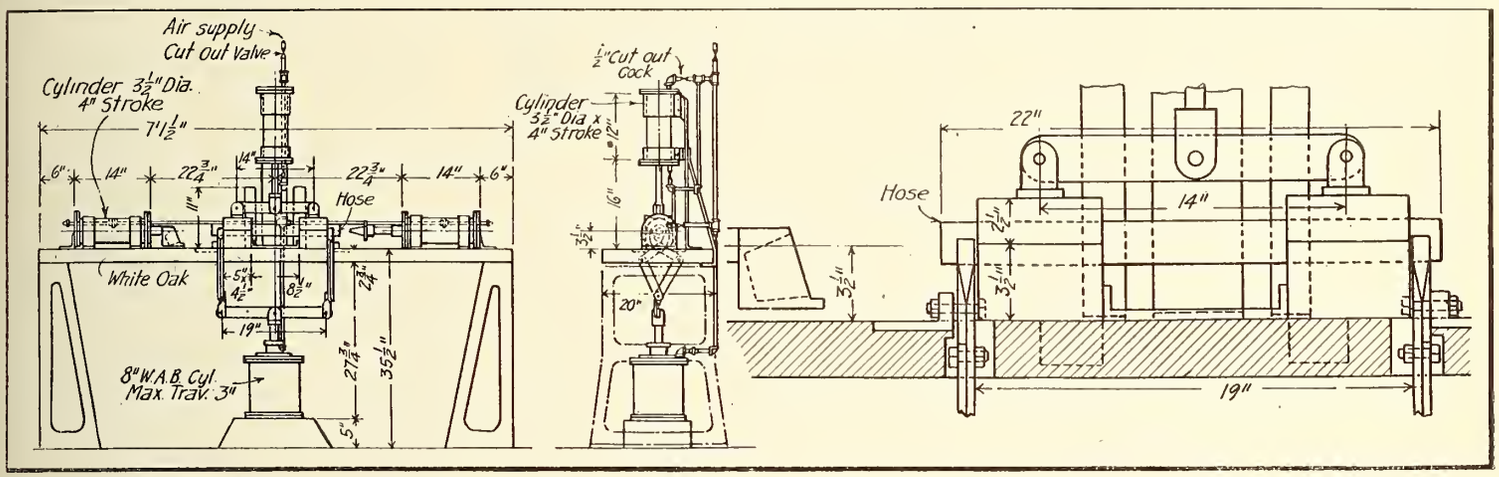


Fig. 6.—C.N.R. Hose Mounting Machine, with Detail of Clamping Heads.

Centre Sill End Reinforcing Member for C.P.R. Freight Cars.

Centre sills of freight cars have always been a subject for study for all car departments, as the expense of maintaining these members has been one of the most vital questions in freight car maintenance, more especially in recent years, when the motive power has been increased beyond the point for which the cars were designed. The starting and bumping strains in a train of freight cars all come through the two centre sills, and this has been the cause of their being frequently broken or split to such a degree as to necessitate renewal, either by introducing an entirely new sill, or else by splicing the sill. With the present high cost of these members, and the cost of labor rising, this has been an expensive undertaking, and has been one of the greatest causes for the introduction in wooden equipment of steel centre sills, and the tendency toward an all steel construction. The recent policy of the C.P.R., when centre sills have been damaged to such an extent as not to be readily repaired by splicing, has been to remove them entirely, and replace with steel centre sills, which can be slipped in place under the damaged car with but little more work than is required in renewing with wooden members.

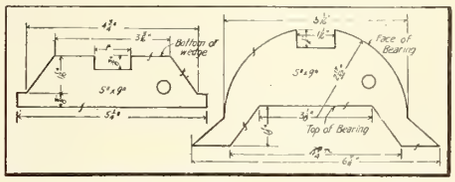
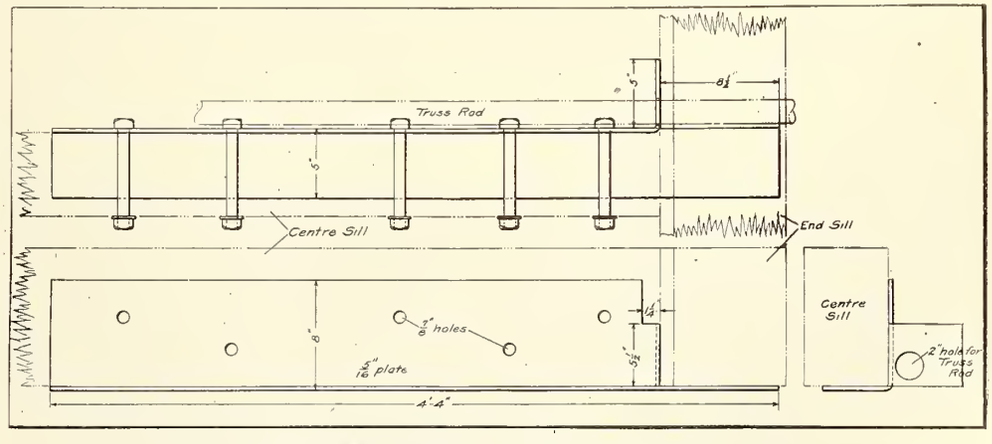


Fig. 5.—C.N.R. Journal Bearing and Wedge Gauges.

The C.P.R. has long maintained that sills that are only slightly split at the ends are still useful, and do not need to be renewed. This opinion is not held by many roads, and difficulty has been experienced at interchange points by the inspectors of other lines refusing to accept these cars, which the C.P.R. claims are quite serviceable. To overcome this trouble, the reinforcing member shown in the accompanying illustration was devised in the C.P.R. Car Department, the first application being made in Montreal in January. Those who are familiar with car repair work know that the ends of the centre sills have a tendency to develop slight cracks, which, in themselves, are generally negligible, but which sometimes develop to such a degree as to render the sill useless. Quite frequently, however, these cracks do not develop beyond the incipient stage, and it would consequently be a needless expense to replace the whole sill or splice the end. To overcome this trouble, and at the same time place the cars in such a state of repair that they will not be refused at interchange points, this reinforcing member was devised.

As the illustration shows, this member is in the form of an angle iron, formed in the bulldozer from a piece of 5-16 in. plate, 4 ft. 4 ins. by 13 ins., with the flange, 8½ ins. from one end, bent back at a right angle. After the removal of the draft gear this member is fitted to the centre sill, one angle to the lower side, and the other to the outer side of the sill, the right angle bend bearing against the end sill, the truss rod passing through a 2 in. clearance hole in this bent lug. Through the vertical flange there are five ¾ in. bolts, which pass through the sill, binding the latter together laterally. The vertical holes in the sill for the attachment of the draft gear are laid out on the horizontal angle of the member, and these holes drilled in the flanges, and this flange tied to the sill, the same as the side flange, the sill being tied securely together, both horizontally and vertically. The lower flange extends under the lower face of the end sill, giving additional support to the latter. The right angle lug along the back of the end sill takes any thrust from the latter into the centre sill without in any way straining the end of the centre sill, and distributes the thrust through a considerable length of the end.



C.P.R. End Reinforcing Member for Slightly Damaged Centre Sills.

The key block construction of the centre sill is not required in this arrangement, as the vertical bolts from the draft gear, passing through the reinforcing plate, transmit

the drawbar strains to the sills over such a length and in such a manner as to make the use of the key block unnecessary.

This type of end reinforcement is to be applied to all cars where the centre sill is but slightly damaged, and it is anticipated that a considerable saving will result. We are indebted to J. Cowley, Car Foreman, C. P.R., West Toronto, for the information on which this article is based.

The National Transcontinental Railway Terminals at Quebec.

In response to a motion by Hon. G. P. Graham, ex Minister of Railways, there was recently submitted to the House of Commons a return showing what changes have been made in the original scheme for N.T. R. terminals at Quebec, the estimated cost of the former and the estimated cost of the terminals under the present scheme. The return, which was prepared by R. W. Leonard, Commissioner, N.T.R., is as follows:—

The original scheme included the erection of a large and expensive passenger station on the Champlain Market site, at the south easterly extremity of the city, in connection with which there would be freight sheds, immigrant sheds, power house, etc., etc. This scheme also included the construction of a revetment wall or wharf 1,930 ft. long in front of the Champlain Market site. Under this scheme the Champlain terminal was to be connected with the Quebec Bridge Co.'s line, already constructed to Pointe a Pizeau, by a double track railway over an ordinary 100 ft. right of way. This scheme also included the erection of a locomotive house at Wolfe's Cove, together with a very limited yard, and yard accessories. Under this scheme several houses were also purchased adjacent to the Champlain Market site. Locomotive and car repair shops were to be constructed in the division yard at the north end of the Quebec Bridge, about six miles from the city, without any existing water, sewer, or street railway connections.

The new Commission, after fully considering its predecessor's scheme for the erection of a $1,000,000 passenger station on the Champlain Market site, came to the conclusion that it would be unwise to go on with the erection of such an expensive structure, as the passenger business, in and out of Quebec, that will be tributary to the N.T.R., would not, and could not, warrant this expenditure on a station building.

The new Commission, after going into the question of the proposed $1,000,000 revetment wall at the Champlain Market site, came to the conclusion that as such an expenditure on this wharf would only result in adding about 100 ft. in width to the present available wharf space, the expenditure would be unwise.

From Pointe a Pizeau to Lampson's Cove the original scheme only provided a right of way 100 ft. wide, except as shown on a map submitted with the return and the lots which the tracks ran through were not acquired out to the deep water line.

The new Commission, consequently, cancelled the old Commission's agreements with the lot owners and made new agreements with them, and I am glad to be able to say that we have acquired all the land, except one small piece, out to deep water, as well as the original right of way, from Pointe a Pizeau to Lampson's Cove, about 3 miles, at a less cost to the Commission than what was originally agreed upon for the right of way only, so that the Government now owns the whole water front from the Champlain Market to Pointe a Pizeau, except one small lot.

The new Commission cancelled the instructions given by its predecessors for the erection of a locomotive house at Wolfe's Cove, on the ground that as there is an 18 stall locomotive house erected at the north end of the Quebec Bridge, a second round house in the same locality was unnecessary, and more so as filling in Wolfe's Cove for the necessary yard tracks, subsidiary buildings, etc., etc., would add greatly to the cost.

The new Commission is of opinion that the public interest and the convenience of the travelling public would be best served by a union passenger and joint terminals, situated near the centre of the business section of Quebec. An agreement to that effect has been concluded with the C.P.R., and a union passenger station will be built on the Palais site, and for the convenience of river traffic a suitable station will be erected on the Champlain site. The advantages of a union passenger, express and local freight station in any city require no comment. This arrangement with the C.P.R. is necessary in order that the N.T.R. may obtain access to the present harbor at the mouth of the St. Charles River, now being extended by the Government, with magnificent grain elevator, immigrant buildings, etc. This arrangement also gives the N. T.R. rights over the C.P.R.'s Dalhousie St. tracks, so that communication may in future be established, if necessary, between the two new stations.

The Commission decided to move the shops site from Neilsonville, near the Quebec Bridge, to St. Malo, for the following reasons:—The new site is immediately adjacent to the labor centre of Quebec city, and reached by the electric railway. Economical sewerage disposal, free water and freedom from taxation have been obtained for 20 years, and also a large and favorable site at a reasonable price.

ESTIMATED COST OF QUEBEC TERMINALS, OLD SCHEME.

Cost of work done and right of way taken over from Quebec Bridge Co., between Quebec Bridge site and Pointe a Pizeau (including track material)	$ 287,169.90	
Estimated cost of completing above	213,600.00	
		$ 500,769.90
Estimated cost of grading, including track, Pointe a Pizeau to Lampson's Cove	$ 392,625.00	
Estimated cost of land, Point a Pizeau to Lampson's Cove (right of way only)	285,772.24	
		678,397.24
Estimated cost of grading, Lampson's Cove to Champlain Market, including 1930 ft. of revetment wall	$1,872,638.10	
Estimated cost of land, Lampson's Cove to Champlain Market	2,155,647.71	
		4,028,285.81
Estimated cost of Wolfe's Cove locomotive house		90,000.00
Estimated cost of Wolfe's Cove yard		108,700.00
Estimated cost of passenger station at Champlain Market (including terminals)		1,100,000.00
Total		$6,406,152.95

ESTIMATED COST OF QUEBEC TERMINALS, PRESENT PLANS.

Cost of work done and right of way taken over from Quebec Bridge Co. between Pointe a Pizeau and Quebec Bridge (including track material)	$ 287,169.90	
Cost of grading to date, Quebec Bridge to Champlain Market	543,000.00	
Estimated cost of completing grading, Quebec Bridge to Champlain Market	57,000.00	
Cost of track material, Pointe a Pizeau to Champlain Market	40,000.00	
Cost of land, Pointe a Pizeau to Champlain Market (includes to deep water line	1,368,050.00	
Estimated cost of station and terminals at Champlain Market	60,000.00	
		$2,355,219.90
JOINT TERMINALS.—Estimated cost of joint teaminals on which the Government pays as annual rental a sum equal to 2¼%:—		
C.P.R. property at Quebec	$3,300,000.00	
Additional land to be purchased for joint terminals	800,000.00	
Terminal station and yards to be built by C.P.R.	1,500,000.00	
	$5,700,000.00	
Annual rental, $128,250.00, capitalized at 4%		3,206,250.00
Leonard Shops:—Land and right of way		285,780.10
		$5,847,250.00

Defects Excluding Locomotives from Service.

The Board of Railway Commissioners issued a circular recently stating that at a meeting of representatives of the principal railways the following memorandum in regard to defects in locomotives was agreed upon:—

Locomotives must not be allowed to leave terminals, or be used at terminals, in traffic service, on which any defects exist, as prescribed in the following list:—

Steam leaks from any part of a locomotive which render it impossible for engineer to see signals in sufficient time to enable him to bring his train to a stop within the required distance.

Air brakes on locomotives or tenders not in serviceable condition.

Wheel defects. Locomotives with steel or steel tired leading engine truck wheels, leading or trailing driving wheels, or tender wheels with flanges worn 1-16 below M. C. B. wheel defect gauge for cars of less than 80,000 lbs. capacity or over.

Locomotives with cast iron engine truck wheels and cast iron wheels under tender weighing over 130,000 lbs. with flanges worn 1-16 below M. C. B. defect gauge for cars of 80,000 lbs. capacity or over.

Locomotives with cast iron wheels under tender weighing 130,000 lbs. or less with flanges worn 1-16 below M. C. B. defect gauge for cars of less than 80,000 lbs. capacity.

Locomotives with truck or tender wheels having shelled out or flat spots over 2½ inches long or so numerous as to endanger the safety of the wheel.

Steel tires on locomotives worn hollow ⅜ in. in depth, or which are worn below safe limit of thickness. Railway companies to file with the Commission tneir standard limit of thickness of tire, on all classes of locomotives, for approval.

Flat or shelled out spots on locomotive driving wheels 3 in. long.

Springs. Locomotives with defective springs on any part of locomotive or tender which are unable to carry their respective weight when locomotive is standing.

The circular also asked railway companies to make by Feb. 23, what, if any, objections they might have to the addition to the memorandum of the following clause:—

"Railway companies are required to equip their locomotives with double windows in the front of the cabs during the winter season, Nov. 1 to April 30, the same to be made air tight."

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alaska Railways.—The bill authorizing the construction by the U.S. Government of railway lines in Alaska, which has been passed by Congress, empowers the President to do practically anything he pleases in order to build railways in Alaska not more than 1,000 miles in extent and at a cost not to exceed $35,000,000. While one purpose of the railway is stated to be the connection of one or more of the Pacific harbors on the southern coast of Alaska with the navigable waters of the Yukon and with the Alaska coal fields, other clauses give the President discretion to build railways in Alaska wherever he deems their construction is justifiable. While the bill authorizes the President to operate as well as construct the railway through any agency he may select, he is also authorized to lease the railways after completion for terms not longer than 20 years.

The President signed the bill authorizing the expenditure of $35,000,000 upon the line, Mar. 12. He is reported to have said that an attempt would be made to gather the working force this year, and to have maps prepared showing the various routes proposed and the conditions prevailing along each.

Alberta and Great Waterways Ry.—J. D. McArthur, who is building this railway, is reported to have said in Winnipeg, Mar. 13, that the location of the line has been finally completed to Lac la Biche, a considerable distance from the point of junction with the Edmonton, Dunvegan and British Columbia Ry., and that construction work will be pushed forward as rapidly as possible. There is considerable settlement in the country through which the line will run for about 70 miles from Edmonton, but beyond that it is virgin territory. The region is specially adapted for dairying. (Feb., pg. 69.)

All Red Line Ry.—In connection with the building of this projected railway in Canada, a steamship line is suggested to run from some point on the Atlantic coast to Black Sod Bay in Ireland. Mr. Worthington, the Dublin, Ireland, man who is promoting the project in Ireland, recently made an application to the Midland Great Western Ry. for £15,000 to aid in the building of a line from Black Sod Bay to a junction with the M.G.W. Ry. The shareholders refused to have anything to do with the project. (Dec., 1913, pg. 579.)

Atlin Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from the southern end of Atlin Lake, generally southerly to the Taku River, where it intersects the International boundary line between British Columbia and what is called the panhandle of Alaska. The provisional directors are:—Y. Kavanagh, G. W. Mitchell, Ottawa; P. Duryee, Vancouver, B. C.; R. E. Gosnell, Victoria, B.C.; C. W. Baker, Boston, Mass.

Bruce Peninsula Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from Wiarton, or from the G.T.R. in Keppel tp., northerly to Tobermory, Ont. The provisional directors are:—J. J. Brown, D. Brown, R. Brown, Owen Sound, Ont.; S. C. Cooper, A: I. Cooper, Lions Head, Ont. (Feb., pg. 69.)

Calgary and Fernie Ry.—Fernie, B.C., press reports state that a start will be made with the construction of this projected railway as soon as the plans have been approved by the Board of Railway Commissioners. (Mar., pg. 121.)

Calumet and Northern Ry.—The Quebec Legislature has granted an extension of time for the building of this projected railway. (Dec., 1913, pg. 573.)

Canadian Alberta Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from Blairmore, Alta., on the C.P.R., northerly and westerly, 14 miles, through townships 8 and 9, range four, west of the 5th meridian, to the section of section 20, tp. 9. The provisional directors are:—G. H. Salmon, C. A. Hancock, R. P. Stockton, R. Smith, J. A. Harvey.

Edmonton, Dunvegan and British Columbia Ry.—It was reported in Edmonton, Alta., Mar. 7, that it was expected that track would be laid to Lesser Slave Lake before the end of March. The putting in of the concrete piers and abutments for the bridge across the Athabasca River is well advanced and it is expected to have the superstructure completed by June 30. The first divisional point will be on the south bank of the Athabasca River, mileage 131. A station building and water tank have been erected, and arrangements are being made for the erection of other divisional buildings. It is also reported that track has been laid for several miles north of the Athabasca River, and that it was expected to have it laid to beyond Sawridge, Mar. 31. (Mar., pg. 121.)

Erie and Ontario Ry.—The route of this projected railway, for the building of which the Dominion Parliament is being asked to grant an act of incorporation, is from Port Maitland, on Lake Erie, to Smithville, Ont., and from Port Maitland to Port Colborne, Ont. The provisional directors are:—W. J. Aikens, Dunnville, Ont.; J. S. Hamilton, W. T. Henderson, K.C., A. J. Wilkes, K.C., Brantford, Ont. (Feb., pg., 69.)

Farnham and Granby Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway from the C.P.R. at Farnham, Que., easterly to Granby, thence northwesterly to Windsor Mills or Shefford, connecting either with the C.P.R. or the Central Vermont Ry. Pringle, Thompson, Burgess and Cote, Ottawa, solicitors for applicants.

Esquimalt and Nanaimo Ry.—It was reported in Victoria, B.C., Mar. 10, that track had been laid to Baynes Sound, about 15 miles from the proposed terminal at Courtenay. It is expected that the bridge over Table River will be completed early in April, when it will be possible to complete the track laying into Courtenay. A contract for the erection of the passenger station, freight shed and locomotive house at Courtenay is reported to have been let to Shields and Newham, Victoria. It is expected that everything will be in readiness for the opening of the line to Courtenay early in June. (Dec., 1913, pg. 573.)

Fredericton and Grand Lake Coal and Ry. Co.—We are officially advised that there is no intention to add to the length of the company's railway lines, the only work in contemplation being the usual sidings in connection with the extension of its mining operations. (Dec., 1913, pg. 574.)

Intercolonial Ry.—Press reports state that a rearrangement of the route of the projected line from Sydney to Leitche's Creek is under consideration, that plans are being prepared for the laying out of new deep water terminals at Sydney and for the rearrangement of the terminal facilities at Sydney and North Sydney, N.S.

It is also reported that surveys are in progress for the completion of a second track between Halifax, N.S., and Moncton, N.B. An Ottawa dispatch Mar. 12, stated that F. P. Gutelius, in a memorandum to the Department of Railways had shown that by reducing the gradient on the Halifax-Moncton section, and on the Point Tupper-Sydney section, and by the strengthening of the bridges, much heavier loads could be drawn, and the cost of transportation considerably reduced. The dispatch adds that the General Manager has been given authority to have the necessary surveys for this work made on the two sections mentioned.

Another press report states that certain interests are trying to get the Department of Railways to have a survey made for a line which would connect Fredericton with the Maine Central Rd. at Vanceboro, Me.

A resolution was passed in the House of Commons Mar. 16 expressing the opinion that the time had arrived for the extension of the I. R. C. into the non-railway sections of the Maritime Provinces within reasonable range of the railway. (Feb., pg. 69.)

Kettle Valley Lines.—Referring to the map showing the K.V.L. constructed and under construction in our Feb. issue, pg. 80, it appears that section D to E Osprey Creek to Otter Creek Summit, 65.5, has not been put under contract. The reason for this is that negotiations have been in progress for some time with a view of a change in location so as to reach the Hope Mountains by way of Princeton rather than via Aspen Grove. The British Columbia Legislature has authorized this change of route, and the applying of the subsidy granted for the construction of the previously located line to be applied to the new route. The new route will save the construction of 40 miles of line, from which there was very little prospect of traffic, and by building into Princeton would enable connection to be made with the Vancouver, Victoria and Eastern Ry. there. From Princeton the K.V. Lines will be given running rights over the V.V. and E. Ry. for 40 miles. The act also provides for the building of a branch line from near Princeton to Aspen Grove and to the Copper Mountain mining camps. The Premier, in explaining the new proposals to the Legislature, said the railway company is required to build only from Penticton to Princeton, 75 miles, and from Merritt to Otter Summit, about 30 miles, thus relieving the Kettle Valley company from constructing its own line between Princeton and Otter Summit and allowing it to use the tracks of the Great Northern Ry. The subsidy agreement will be varied so that in lieu of the amounts formerly granted the province will pay $5,000 a mile for the line from Penticton wharf to a junction with the V., V. & E. at or near Princeton, not exceeding 75 miles, and from a junction with the Nicola, Kamloops and Similkameen Ry. at Merritt to Otter Summit not exceeding 30 miles. The branch lines to Aspen Grove and to Copper Mountain will be built when required.

The Minister of Railways, on Feb. 24, approved of a route map for the line from Siwash Creek to Otter Creek Summit, 63.5 miles.

A. U.S. press dispatch states that a contract has been let for the construction of the line from Osprey Lake to Coldwater Summit, to Guthrie McDougall & Co., Portland. Ore. (Mar., pg. 121.)

Kettle Valley Ry.—An ice jam sweeping down the Fraser River, on Feb. 12, carried away 250 ft. of falsework which had been erected for the K.V.R. bridge at Hope. Work on the substructure was begun about two

months previously and the falsework had been extended 750 ft. from the south shore. Above Hope the river has been tightly packed with icefloes which had drifted down from the upper reaches of the Fraser, and when the temperature dropped suddenly the whole mass commenced to move. The contractors, Armstrong and Morrison, of Vancouver, had foreseen this occurrence, and one of the costly open caissons which was ready for launching was saved by being secured behind a breakwater. All the men on the work were warned in time to escape, but part of the falsework went out, and in so doing precipitated into the river two hoisting engines, a derrick and a concrete mixer. After some difficulty all this equipment was salved and is reported not seriously damaged. The contractors still hope to complete the substructure before high water, which is due about May 1. The bridge is to be a double deck structure supported on four 238 ft. spans.

Lake Erie and Northern Ry.—We are officially advised that no statement has been made by W. P. Kellett, General Manager, to the effect that the line when completed will be operated both as a steam and electric railway, as stated in press reports. It is, however, persistently reported that the line will in the main be operated by electricity, either by an electric locomotive, or by individual gasoline motor cars.

The bridge work at Paris on the Brantford-Galt section of the line was completed Mar. 12, and it was expected that track would be laid into Brantford, Mar. 24. (Mar., pg. 126.)

Lake Huron and Northern Ontario.—The Minister of Lands stated in the Ontario Legislature, Mar. 4, that the Government had been informed that the company had started construction work, but had no official information as to the nature of the operations, or of the progress made. No lands had been sold to the company for settlement under the provisions of the act passed in 1913. (July, 1913, pg. 331.)

Minneapolis, St. Paul and Sault Ste. Marie Ry.—It is reported that the company will put its new Chicago freight terminal in operation April 1. It has been under construction since 1912, and is estimated to have cost $6,000,000. It covers an area of 18½ acres, of which 17.7 acres are under roof. In its construction, 108,000 cubic yards of concrete were used, and 6,500 tons of steel. All trackage is elevated and the part of the building on the street level constitutes one of the largest storage warehouses in the world. The terminal was constructed by the Central Terminal Co., a subsidiary company of the M.S.P. & S.M.R. line. The existing leased freight terminals at South Water and Lake Streets will be abandoned. Starting the same day, the company's passenger trains will be run into the Grand Central station, instead of the Illinois Central Rd., a contract for 99 years having been made with the Baltimore and Ohio Rd. (Aug., 1913, pg. 376.)

Norfolk and Elgin Ry.—The Dominion Parliament has under consideration a bill to incorporate a company with this title to build a railway from Simcoe to 1.5 miles northwest of Langton, thence to Port Burwell, Ont., and to operate steam and other vessels and car ferries in connection with its line. The provisional directors are:—S. F. Adalia, W. H. Price, C. M. Garvey, F. L. Somerville, J. Harris, Toronto. (Feb., pg. 70.)

Northwestern Ry. of Canada.—The provisional directors named in the application to the Dominion Parliament for the incorporation of a company with this title are:—C. W. MacLean, Pointe Claire, Que.; H. B. Stewart, Beebe Plain, Que.; F. G. Gillespie G. B. Holme, F. D. Ames, J. P. Vincent, W. C. Thomson, New York. (Mar., pg. 121.)

Pacific Great Eastern Ry.—The British Columbia Legislature has granted a guarantee of bonds at the rate of $35,000 a mile for 30 miles of line in addition to the 450 miles specified in par. 4 of the agreement forming schedule A of the original act; and an additional $7,000 a mile in respect of the line from Vancouver to Fort George, 480 miles, as a second charge on the line, ranking next after the charge created by the deed of July 10, 1912. The 30 miles mentioned is the difference between the original estimate of distance between Vancouver and Fort George, and the actual mileage of the located route. The necessity for the increase of the guarantee of bonds of $7,000 a mile was stated by the Premier to be the fact that the estimated cost of construction was found on final surveys to be $58,000 a mile instead of the $45,000 originally estimated.

The company has authority to extend the line to Peace River, 330 miles, and the Premier explained that this line will form part of a through line from Vancouver to the Yukon, and Alaska.. The act aiding the construction of this line provides for the guarantee by the Province of the company's bonds for $35,000 a mile at the rate of 4½% for 330 miles, more or less. An agreement for the construction of this line, in terms similar to that for the building of the Vancouver-Fort George line, is to be entered into between the Government and Foley, Welch and Stewart.

It was reported, Mar. 10, that it was expected to have track laid to Horseshoe Bay, 13 miles out of Vancouver, by June 30 From that point to Squamish, the terminal at Newport, the line will have to be built through solid rock, and is not to be finished until June 30, 1915. Track has been laid from Squamish to Swift Creek, 14 miles, which includes the seven miles of track laid by the old Howe Sound and Northern Ry. Grading is practically completed to the Pemberton Meadows, 60 miles from Squamish, and to the north east end of Anderson Lake, 30 miles beyond. For 12 miles beyond Anderson Lake there is some heavy rock cutting yet to be done, while beyond to the crossing of the Fraser River, near Lillooet, the grading is finished. The piers and abutments for this bridge are expected to be completed in June. Some grading has been done from the Fraser River crossing to Kelly Lake, mileage 200 from Vancouver. The work on the section from Kelly Lake to Fort George, 280 miles, is comparatively light, and will be gone on with during the summer.

Survey parties are to be sent out early in April from Fort George to locate the projected line to the Peace River, 330 miles. A reconnaissance party, in charge of L. C. Gunn, is now on the field. It is expected that a start will be made on construction in May. (Mar., pg. 121.)

Peace River Tramway and Navigation Co.—In passing through the House of Commons recently, the act of incorporation was changed to authorize the building of a standard gauge railway instead of the narrow gauge one originally contemplated. The total length of the projected line is about 16 miles, which will connect up breaks in the navigation on the Slave and Peace rivers. The principal break is at the Vermillion rapids. (Mar., pg. 122.)

Quebec Central Ry.—An extension of the Q.C. Ry. from St. Sabine, Dorchester County, to English Lake, also called Lac La Frontier, a distance of 25 miles, has been surveyed and located. Plans, profiles, etc., have been deposited with the Railway Department at Quebec, and the location approved of. Ten miles of the line from St. Sabine to five miles east of St. Camille is under construction, a portion of which was actually built during last year, and the balance of the 10 miles will be completed during this year. It is expected that the other 15 miles will be constructed in 1915, so that the line to English Lake will probably be in operation by the end of 1915. The work is being done under the direction of J. T. Morkill, Chief Engineer, assisted by J. M. Hibbard. The route follows the water shed of the St. John River and is close to the boundary line between the Province of Quebec and State of Maine. At English Lake the line will be within 1,000 ft. of the International Boundary line. It is through a thickly wooded country with rich clay and loamy soil, and well adapted for cultivation when the land is cleared. (Feb., pg. 70.)

Rimouski International Ry. — The Dominion Parliament is being asked to authorize the company to change its name to the Interprovincial Ry. to build a railway from St. Germain de Rimouski, Que., in as direct a line as possible to Edmundston, N. B., and to extend the time for the building of the lines authorized by chap. 129 of the statutes of 1909. Asselin and Asselin, Rimouski, Que., solicitors for applicants. (May, 1909, pg. 173.)

Shefford, Bagot and Missisquoi Ry.—The Quebec Legislature has incorporated a company with this title to build a railway from St. George, on the International Boundary between Quebec and Vermont, to a junction with the Intercolonial Ry. between Bagot and St. Eugene, Que. The provisional directors are:—W. H. Robinson, Granby, Que.; A. R. McMaster, Montreal; J. G. Gibson, Dunham, Que.; A. W. Runnells, Springfield, Mass.; J. E. Runnells, Worcester, Mass. (Jan., pg. 22.)

St. John and Quebec Ry.—The plans of the proposed bridges across the River du Chute and Lake Otanabog, N.B., have been deposited with the registrar of deeds for the counties of Victoria, Carleton and Queens.

At the opening of the New Brunswick Legislature, recently, the Lieutenant Governor said it is hoped that the three sections of the line from Centreville to Gagetown will be ready for operating by June 30. (Feb., pg. 70.)

Taber Transit Co.—J. F. Kramer is reported to have stated in Taber, Alta., Mar. 6, that he is prepared to start construction on the proposed railway from Taber to the coal mines. (Sept., 1913, pg. 433.)

Toronto Union Station.—At a meeting of shareholders of the Toronto Terminals Ry. Co. held in Toronto, Mar. 6, the following directors were elected:—

E. J. Chamberlin, W. Wainright, H. G. Kelley, representing the G.T.R., and Sir Thomas G. Shaughnessy, D. McNicoll and J. W. Leonard representing the C.P.R. This company has been organized to construct the new union station and terminals at Toronto, in which the C.P.R. and G.T.R. each owns one half interest. All other railways entering Toronto, however, will have the privilege of using the station and terminals upon terms to be arranged. It is officially announced that construction will commence as soon as the preliminary arrangements can be concluded, and the work will be carried to completion as early as the conditions will permit. The company has an authorized capital of $2,000,000 and bonding powers of $10,000,000. It is said that the company will take over from the G.T.R. the areas on the waterfront expropriated by that company at the price it paid for them. From the C.P.R. it will take over the lease of the Don tracks. The companies will share equally in the interest charges on capital expenditure. That is, if $15,000,000

is spent, the C.P.R. will pay 2½% on that amount each year, and the Grand Trunk will also pay 2½%. For operation and maintenance within the limits of the Terminal Co.'s territory, each road will pay on a wheelage basis.

The officers of the company are as follows: President, Wm. Wainwright; Vice-President, D. McNicoll; Secretary, H. Phillips; Treasurer, H. E. Suckling; General Auditor, W. H. Ardley; Chief Engineer, J. R. W. Ambrose.

Vancouver Railway and Ocean Terminal Co.—The Vancouver, B.C., City Council is preparing to oppose the bill which came before the Dominion Parliament, Mar. 21, asking for the incorporation of a company with this title. The provisional directors are said to be five Vancouver financial men. (Mar., pg. 122.)

Western Dominion Ry.—Application is being made to the Dominion Parliament to extend the time within which the company may build the railway authorized by chap. 168 of the statutes of 1912; to ratify an agreement whereby the Alberta Pacific Ry. and the W.D. Ry. were amalgamated, and to authorize the construction of the following branch lines:—From section 15, tp. 10, range 2, west of the 5th meridian, westerly and northwesterly along the north fork of the Old Man River, to the boundary between Alberta and British Columbia; from section 19, tp. 18, range 2, west of the 5th meridian, westerly along the Highwood River to the boundary between Alberta and British Columbia; from section 35, tp. 19, range 3, west 5th meridian, westerly along the south branch of Sheep River to the boundary between Alberta and British Columbia. O. E. Culbert, Ottawa, is Secretary of the company. (Oct., 1913, pg. 476.)

Winnipeg.—We are officially advised that the contract for building the construction railway from Winnipeg to Shoal Lake has been let to the Northern Construction Co. It was let sooner than was expected, because the Commission realized that it was necessary it should be finished during this year. If this is to be accomplished the contractors must have the work in hand early enough to get their supplies in and camps established before the winter breaks up.

Other contracts for supplies, etc., for the railway construction have been let as follows:—Steel rails, Algoma Steel Corporation; steel splice bars, Steel Corporation of Canada; clearing right of way, E. J. Bawlf; residences for division engineer, J. F. McInnes.

The Commissioners received tenders to Mar. 23 for the supply and delivery of a locomotive with tender, and a snow plough. (Mar., pg. 122.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Carload Mileage Rates on Grain.

General order 121. Feb. 26. Re complaint of Dominion Millers' Association and Campbell Milling Co. against proposed increase in less than carload mileage rates on grain and grain products, published in tariffs of the railway companies, to take effect Sept. 1, 1913; and General Order 109, Aug. 27, 1913, suspending the increased rates until further order. Upon its appearing that an agreement has been reached between the millers and carriers' representatives for a basis of less than carload mileage rates to apply on grain and grain products in lieu of the rates suspended under order 109, the agreed rates to become effective Mar. 2, 1914. It is ordered that general order 109 be rescinded from Mar. 1, 1914.

Suspension of Freight Tariffs Removed.

General order 122. Mar. 4. Re general order 116, Dec. 24, 1913, suspending, for the present and pending investigation, tariffs filed by railway companies, increasing the minimum carload weights on buckwheat, oats, bran (in bulk), dried beet pulp, oat hulls (in bulk), pea hulls (in bulk), shorts, beets (except sugar), onions, turnips and potato . Upon the return of the notice calling upon the railway companies to justify the proposed increase in the minimum weights on the commodities referred to, the C.P.R., the Toronto Board of Trade, the G.T.R., and the Canadian Manufacturers Association being represented at the hearing, and upon the report of the Board's Traffic Officer it is ordered that general order 116 be rescinded.

G.T.P.R. Standard Freight Mileage Tariff.

21356. Feb. 12. Re application of Grand Trunk Pacific Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Mileage Tariff, C.R.C. 21, incorporating and superseding C.R.C. 19, approved by order 20441, Sept. 27, 1913, by an extension of the mileage thereof, to apply between the company's stations in British Columbia between Prince Rupert and Wordsworth, inclusive. Upon the report and recommendation of the Board's Chief Traffic Officer it is ordered that the company's said tariff be temporarily approved, pending judgment in the inquiry into the rates charged generally by railway companies in British Columbia.

Building Papers and Pulpwood Rates.

21402. Feb. 21. Re supplement 40 to C.P.R. tariff, C.R.C. no. E-2353, and supplement 28 to G.T.R. tariff, C.R.C. no. E-2513, increasing minimum on building papers and pulpwood from 24,000 to 40,000 lbs., effective Feb. 23, 1914. Upon the application of the Canadian Manufacturers Association, complaining against the said increases, it is ordered that, for the present and pending investigation by the Board, the said increased minima on building papers and pulpwood be suspended.

Exclusive Use of Drawing Rooms, Etc.

21413. Feb. 24. Re tariffs filed by certain railway companies, requiring additional railway tickets for the exclusive use of drawing rooms or compartments in sleeping or parlor cars. It is ordered that the following schedules, in so far as they affect tolls between points, both of which are in Canada, be suspended, pending investigation by the Board: G.T.R. Tariff, C.R.C. No. E-1989; Wabash Tariff, C.R.C. 818; Wabash Supplement 1 to C.R.C. 818; Central Vermont Tariff, C.R.C. 378; Rutland Tariff, C.R.C. 514; Michigan Central Tariff, C.R.C. 1887; Toronto, Hamilton & Buffalo Tariff, C.R.C. 935; C.P.R. Tariff, C.R.C. no. E-2410; C.P.R. Tariff, C.R.C. no. W-1592; Quebec Central Tariff, C.R.C. 76.

Paper and Woodpulp Rates.

21434. Mar. 3. Re application of Canadian Manufacturers Association complaining against the advanced minimum weights per car on paper, woodpulp, and woodpulp board published in C.P.R. Supplement 40 to its Tariff, C.R.C. no. E-2353, and G.T.R. Supplement 28 to its Tariff, C.R.C. no. E-2513, and order 21402, Feb. 24, 1914, suspending the increased minimum, as provided in the said supplements, for the present and pending investigation by the Board. Upon hearing the matter at the sittings of the Board held in Ottawa this date, the Canadian Manufacturers Association and the C.P.R. being represented at the hearing, and what was alleged; and upon the consent of the said parties, filed, it is ordered that order 21402, in so far as it suspends Supplement 40 to C.P.R.'s Tariff, C.R.C. no. E-2353, be rescinded. That Supplement 44 to C.P.R. Tariff, no. E-2353, substituting revised minimum weights per car on paper, woodpulp, and woodpulp board, be lawfully in effect from and including Feb. 25, 1914. That, upon the publication and filing of a supplement to G.T.R. Tariff, C.R.C. no. E-2513, substituting similar revised minimum weights on the said commodities for the minimum weight of 40,000 lbs., shown in its Supplement 28, suspended by order 21402, the said order shall lapse and cease to be effective.

Railway Finance, Meetings, Etc.

Atlantic, Quebec and Western Ry.—E. B. Read, Temple Chambers, London, Eng., has been appointed trustee, in place of Hon. C. M. Knatchbull-Hugesson, under the debenture trust deed of June 26, 1905, between the New Canadian Co. and others as trustees. A copy of the indenture, showing Ry. Co.'s line, and the deficit to be provided the change of trustees, was filed with the Secretary of State at Ottawa, Mar. 4.

Canadian Northern Ry.—There has been deposited with the Secretary of State at Ottawa a trust deed securing an issue of the company's 30 year 4½% bonds at $15,000 a mile on certain lines in Saskatchewan, and dated Feb. 1; and trust deeds supplementary to those dated Jan. 21, 1912; Feb. 10, 1914, and May 18, 1909, securing bond issues and the building of lines in Saskatchewan.

Dominion Atlantic Ry.—Intercolonial Ry.—The lease of the line from Windsor Jct. to Windsor, N.S., known as the Windsor branch of the Intercolonial Ry., to the Dominion Atlantic Ry., expired Dec. 31, 1913. The House of Commons was informed recently that the company had made application for a new lease, and that negotiations were in progress as to terms and conditions.

New Brunswick Coal and Ry. Co.—The New Brunswick Legislature has under consideration a bill providing for the consolidation of all the acts respecting the issue of debentures for the company. The company, on the completion of its line, took over the Central Ry. of New Brunswick and subsequently got into financial difficulties. The property was taken over by the New Brunswick Government, together with its liabilities, and considerable sums were expended on putting the line into good condition and in meeting deficits. The C.P.R. has secured a lease of it for operation in connection with the Fredericton and Grand Lake Coal and Ry. Co.'s line, and the deficit to be provided for up to the date when the C.P.R. entered into possession is $67,260.49. The bill provides for the consolidation of all the amounts of debentures issued on account of the line and the provision of a special sinking fund for the discharge of the same.

Quebec Southern Ry.—The settlement of the affairs of the old Q.S. Ry. Co. is being proceeded with slowly. The Exchequer Court of Canada is calling upon the creditors of the East Richelieu Valley Ry. to file their claims by April 21. The E.R.V. Ry. was one of the small lines which were amalgamated under the title of the Q.S. Ry., and are now controlled by the Delaware and Hudson Co.

White Pass and Yukon Ry.—A London, Eng., cablegram, Mar. 7, stated that more than ordinary interest was being evinced in the issue of a loan of £70,000 by the company, to take the form of 6% secured notes, redeemable by drawings at par, until Nov., 1918, when the whole issue will be paid off.

Railway Route Map Approved.—The Department of Railways, on Feb. 24, approved the route map of the Kettle Valley Ry., from Siwash Creek to Otter Creek Summit, B.C., 63.5 miles.

Mainly About Transportation People.

J. C. STUART, Assistant to President, Erie Rd., died at Garden City, N.Y., Mar. 4, aged 53.

D'ARCY TATE, Vice President, Pacific Great Eastern Ry., returned to Victoria during March, after a trip to Great Britain.

G. W. STEPHENS, formerly Chairman of the Montreal Harbor Commissioners, is a candidate for the mayoralty of Montreal.

W. H. POOLE, formerly G.T.R. station master at London, and later at Niagara Falls, Ont., died at Niagara Falls, Mar. 13, aged 75.

G. H. STREVEL, one of the earliest railway contractors in Northwestern Canada, died at Portage la Prairie, Man., Mar. 17, aged 79.

J. E. HUTCHINSON, Manager, Canadian Northern Ry. Prince Edward Hotel, Brandon, Man., was on leave of absence for a month during March.

H. E. BEASLEY, General Superintendent, Esquimalt and Nanaimo Ry., Victoria, B.C., returned to duty, Mar. 9, after an absence of two weeks, due to illness.

The engagement is announced of J. J. ASHWORTH, Secretary and Assistant Manager, Canadian General Electric Co., Toronto, to Miss A. L. Cooke.

JAMES PRINGLE, who died at Stratford, Ont., Mar. 3, aged 83, was formerly in G.T.R. service, having been stationmaster of the first station there.

C. H. NICHOLSON, Manager, G.T. Pacific Coast Steamship Co., returned to Vancouver, B.C., at the end of February, after a six weeks trip in Eastern Canada.

ROBERT BRUCE, of Ottawa, Ont., succeeds the late George Brophy as Superintending Engineer of the Ottawa River works under the Public Works Department.

F. H. PHIPPEN, General Counsel, Canadian Northern Ry., Toronto, Mrs. Phippen and their daughter, left Toronto early in March to spend two or three weeks in Europe.

N. S. DUNLOP, Tax and Insurance Commissioner, and Claims Adjuster, C.P.R., Montreal, left there early in March for a trip through Florida and the Southern States.

Miss Helen McNicoll, daughter of D. McNICOLL, Vice President, C.P.R., Montreal, has had two of her pictures accepted by the Royal Society of British Artists, for exhibition.

SIR THOMAS SHAUGHNESSY, with Lady Shaughnessy and family, were visitors at Atlantic City, N.J., during March. Sir Thomas returned to Canada after a few days absence.

SIR JOHN MURRAY, who was killed in Scotland, Mar. 16, in an automobile accident, was a brother of the late James Murray, at one time Superintendent, C.P.R., at Winnipeg.

A telegram to Ottawa, Mar. 16, reported that the HON. F. COCHRANE, Minister of Railways and Canals, who is in the south of France for the benefit of his health, was progressing favorably.

T. AHEARN, President, and J. D. FRASER, Director and Secretary-Treasurer, Ottawa Electric Railway, left Ottawa, Mar. 3, for a three weeks trip to Florida and other southern points.

J. O. BROWN, who died at Fredericton, N.B., recently, aged 71, was identified with the construction of various railway lines in New Brunswick, among them being the Northern, C.P.R., and Central of New Brunswick.

D. B. HANNA, Third Vice President, Canadian Northern Ry., addressed the Toronto Y.M.C.A.'s Finance Forum, on Mar. 3, on the effect of railways on the civilization of new countries.

H. B. YEWDALL, one of the purchasing agents in the Right of Way Department, C.P.R., Winnipeg, was presented with a silver tea service by the local staff, on his marriage recently.

CARL R. GRAY, whose resignation as President, Great Northern Ry., St. Paul, Minn., was reported in our last issue, has been appointed President, Western Maryland Ry., Baltimore, Md.

J. S. DENNIS, Assistant to the President, C.P.R., in charge of the Natural Resources Department at Calgary, Alta., addressed the members of the Calgary Ad. Club, Mar. 11. on the colonization of Western Canada.

SIR THOMAS TAIT, formerly Chairman of the Victorian State Railway Commission,

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D. M. Crawford,
Commercial Agent, Grand Trunk Ry.,
Pittsburgh, Pa.

addressed the Canadian Railway Club in Montreal, Mar. 10, on Australia, with special reference to its railway system.

D. B. HANNA, Third Vice President, Canadian Northern Ry., Toronto, is shown by the Directory of Directors, published in London, Eng., to be a director of 30 companies. Only 17 persons are shown to be directors of more than 22 companies each.

H G McMICKEN, formerly of Winnipeg whose appointment as European Traffic Agent, Great Northern Ry. (U.S.A.), in London, Eng., ceased at the end of 1913, has established a general steamship ticket agency at 64 Haymarket, London.

W. K. BIXBY, Receiver of the Wabash Rd., has resigned on account of poor health. He is the second of the three receivers to resign recently, F. A. Delano having withdrawn to become President of the Chicago, Indianapolis & Louisville Ry. E. B. Pryor is now sole receiver.

G. E. FAIR, Managing Director and Secretary Treasurer, Farrar Transportation Co., Collingwood, Ont., was presented with a cabinet of silverware and an address by a number of local citizens, on his leaving for Toronto, where the head office of the company has been moved to.

E. G. TRUMP, Chief Dispatcher, District 2, Manitoba Division, C.P.R., Winnipeg, was presented with a gold watch and a travelling bag, with a cut glass bowl for his wife, by the local dispatching staff, Mar. 6, on his transfer to Moose Jaw, Sask., as Chief Dispatcher, District 2, Saskatchewan Division.

A. C. GALBRAITH, General Superintendent of Construction, Edmonton, Dunvegan and British Columbia Ry., is being sued at Edmonton, Alta., by G. G. Whyte, a contractor, for $5,000 for damages alleged to have been sustained through being forcibly ejected from the railway office recently.

C. E. JENNEY, who has been appointed General Agent, Passenger Department, G.T.R., G. T. Pacific Ry., and G. T. Pacific Coast Steamship Co., Vancouver, B.C., was presented with a purse of money by a number of his associates, Mar. 7, on his leaving Toronto, where he was City Passenger and Ticket Agent, G.T.R.

H. D. STOKER, who has been appointed Westbound Traffic Agent, Manchester Liners, Ltd., Montreal, was born in England, and has been in C.P.R. Steamships service for the past six years, three of which were in Vancouver, B. C., and the remainder in the Vice President's office in Montreal.

STEPHEN BURROWS, of Belleville, Ont., who, among other things, is city ticket agent, C.P.R., there, has organized Burrows of Belleville, Limited, which has been incorporated under the Ontario Companies Act with an authorized capital of $50,000, to acquire and carry on his insurance, express and ticket agencies, etc.

A. BUTZE, Assistant Secretary and Purchasing Agent, National Steel Car Co., Hamilton, Ont., died at St. Louis, Mo., Mar. 3. He was born at Quincy, Ill., in 1845, and entered G.T.R. service in 1896, and retired in Jan., 1912, when General Purchasing Agent at Montreal. Prior to entering G.T.R. service he had served with the Wabash Rd., Missouri Pacific Ry., and the Monon Route, and had been in the general railway supply business.

T. S. SCOTT, President and Manager of Columbia Bitulithic, Limited, has resigned to practice as consulting engineer at Vancouver. He is a graduate of Queens University, Kingston. His experience includes contract work in connection with Niagara Falls power construction, maintenance on the Grand Trunk, and the Timiskaming and Northern Ontario Ry., and municipal work as principal assistant to the City Engineer of Toronto.

A. K. LEIGHS, whose appointment as Car Foreman, G.T. Pacific Ry., McBride, B.C., was announced in our last issue, was born in Great Britain, Mar. 6, 1883, and entered railway service Oct., 1908, since when he has been, to Nov., 1909, leading hand, C.P.R., Winnipeg; Nov., 1909, to Feb., 1911, Assistant Night Foreman, C.P.R., Winnipeg; Feb., 1911, to Feb., 1912, Night Foreman, C.P.R., Winnipeg; May to Aug., 1912, car repairer, G.T. Pacific Ry., Edson, Alta.; Aug., 1912, to Jan., 1913, Car Inspector, same road, Edson, Alta.; Jan., 1913, to Feb., 1914, air brake man, same road, Edson, Alta.

H. M. POTTICARY, whose appointment as Soliciting Freight Agent, Canadian Northern Ry., Montreal, was announced in our last issue, was born at Wallaceburg, Ont., Sept. 11, 1888, and entered railway service, June 20, 1904, since when he has been, to

May 31, 1906, yard clerk, night clerk, and chief clerk, consecutively, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; June 1, 1906, to Oct. 13, 1912, billing clerk, claims, abstract and accounting clerk and joint cashier C.P.R. and T.H. & B.R., Hamilton, Ont.; Oct. 14, 1912, to Jan. 31, 1914, Soliciting Freight Agent, Canadian Northern Ry., Toronto.

ALPHONSE J. DONEGAN, who has been appointed Superintendent, Algoma Eastern Ry., Sudbury, Ont., was born at Perth, Ont., Feb. 17, 1882, and entered transportation service June 1, 1899, since when he has been, to May 1, 1900, freight clerk, C.P.R., London, Ont.; May 1, 1900, to Mar. 15, 1901, billing clerk, Dominion Express Co., London, Ont.; Sept. 1, 1910, to Mar. 15, 1911, storekeeper, Lake Superior Iron and Steel Co., Magpie Mine, Ont.; Mar. 15, 1911, to Oct. 15, 1913, Assistant Superintendent, Algoma Central and Hudson Bay Ry., Michipicoten, Ont.; Oct. 15, 1913, to Mar. 1, 1914, Superintendent, same road, Hawk Jct., Ont.

SYDNEY E. DEWEY, whose appointment as Commercial Agent, All Rail Lines, G.T.R., New York, was announced in our last issue, was born at Beckenham, Kent, Eng., July 4, 1879, and entered G.T.R. service, Jan. 1, 1896, since when he has been, to May 10, 1893, clerk, Division Freight Office, Toronto; May 10, 1903, to Mar. 1, 1904, Soliciting Freight Agent, Hamilton, Ont.; Mar. 1, 1904, to Apr. 16, 1906, Travelling Freight Agent, Hamilton, Ont.; Apr. 16, 1906, to Jan. 14, 1907, Contracting Freight Agent, New York; Jan. 14, 1907, to Oct. 23, 1911, Travelling Freight Agent, New York; Oct. 23, 1911, to Feb. 16, 1914, Commercial Agent, Pittsburgh, Pa.

DON MATTHEWS CRAWFORD, whose appointment as Commercial Agent, G.T.R., Pittsburgh, Pa., was announced in our last issue, was born at South Bend, Ind., May 28, 1886, and entered railway service, Sept. 1, 1901, since when he has been, to Mar. 1, 1903, clerk and stenographer, Freight and Passenger Departments, Chicago Great Western Ry., Pittsburgh, Pa.; Mar. 1, 1903, to June 1, 1905, similar position, Seaboard Air Line Ry., Pittsburgh, Pa.; Oct. 1 to Nov. 5, 1905, stenographer, Freight and Passenger Departments, Pittsburgh and Lake Erie Rd., Pittsburgh, Pa.; Nov. 5, 1905, to Nov. 1, 1909, stenographer and clerk, G.T.R., Pittsburgh, Pa.; Nov. 1, 1909, to Feb. 16, 1914, Travelling Freight Agent, G.T.R., Pittsburgh, Pa.

HAMILTON McMURRAY KILLALY, B.A.Sc., M. Can. Soc. C.E., who died at Montreal, Mar. 18, was born at St. Joseph, Mo., July 25, 1871, and graduated from McGill University. During 1897 he was in charge of the construction of a section of the C.P.R. at Crowsnest, B.C.; 1897 to 1898, Resident Engineer on construction, Kootenay Valley Ry.; 1899, Resident Engineer on construction, Erie and Detroit Rd.; and in the same year in charge of a locating party, Algoma Central and Hudson Bay Ry.; 1902 to 1906, Assistant Engineer, in charge of certain location and reconnaissance work, C.P.R.; 1906 to Aug., 1913, Engineer of Surveys, in charge of surveys and location, Eastern Lines, C.P.R., Montreal; Aug., 1913, to the date of his death, Engineer of Construction, Canadian Government Railways, Moncton, N.B.

FREDERICK GEORGE WOOD, whose appointment as Commercial Agent, Canadian Northern Ry., St. Louis, Mo., was announced in our last issue, was born at Toronto, Sept. 15, 1890, and entered railway service in 1906, since when he has been, to 1908, clerk, District Freight Agent's office, G.T.R., Toronto; 1908 to 1909, clerk, General Freight and Passenger Agent's office, Canadian Northern Ry., Toronto; 1909 to Aug., 1910, secretary to General Freight and Passenger Agent, C.N.R., Toronto; Aug., 1910, to Feb., 1911, chief clerk, District Freight Agent, G. T. Pacific Ry., Edmonton, Alta.; Feb. to Apr., 1911, secretary to General Traffic Manager, Canadian Northern Ry., Toronto; Apr., 1911, to June, 1912, Contracting Freight Agent, C.N.R., Pittsburgh, Pa.; June, 1912, to Feb., 1914, Travelling Freight Agent, C.N.R., Pittsburgh, Pa.

WILLIAM APPS, who died at Toronto, Mar. 21, aged 66, was born at Helston, Cornwall, England, and was, from May, 1881, to Oct., 1887, General Foreman, Car Department, St. Paul, Minneapolis and Manitoba Ry.; Oct., 1887, to May, 1891, Master Car Builder, Western Ry. of Alabama and Atlantic and West Point Ry.; June to Sept., 1891, Master Car Builder, Chicago and Eastern Illinois Rd.; Oct., 1891, to Dec., 1895, Master Car Builder, Illinois Central Rd., Chicago, Ill.; Dec., 1895, to Sept., 1902, Master Car Builder, C.P.R., Montreal; Sept., 1902, to 1906, Master Car Builder, Algoma Central and Hudson Bay Ry., Sault Ste. Marie, Ont. He subsequently engaged in building operations in Toronto, which he later discontinued owing to failing eyesight, becoming totally blind about a year ago. J. O. Apps, General Baggage Agent, C.P.R., Montreal, is a son.

ROBERT GRANT THACKRAY, whose appointment as chief clerk and Auditor, Midland Ry. of Manitoba, Winnipeg, was announced in our last issue, was born at Ottawa, Ont., May 23, 1889, and entered railway service in June, 1910, since when he has been, to Oct., 1910, clerk in Freight Claims Department, C.P.R., Winnipeg; Oct., 1910, to June, 1911, clerk, Local Freight Office, C.P.R., Regina, Sask.; June to Sept., 1911, clerk, Superintendent's office, C.P.R., Moose Jaw, Sask.; Sept., 1911, to June, 1912, railway claims clerk in private business, Moose Jaw, Sask.; June to Sept., 1912, clerk, District Freight Office, Canadian Northern Ry., Winnipeg; Sept. to Nov., 1912, clerk, General Freight Office, G.T. Pacific Ry., Winnipeg; Nov., 1912, to Feb. 1, 1914, clerk in Manager's office, Winnipeg Joint Terminals, C.N.R. and G.T.P.R.

CECIL WRAY JOHNSTON, whose appointment as Assistant to the Passenger Traffic Manager, G.T.R., Montreal, was announced in our last issue, was born at Actonvale, Que., July 27, 1879, and entered G.T.R. service Sept. 1, 1897, since when he has been, to Mar. 8, 1900, operator and agent at Richmond, Que.; Berlin, Ont.; Island Pond, Vt.; and Sherbrooke, Que., consecutively; Mar. 9, 1900, to June 21, 1901, clerk to Auditor of Freight Accounts, Montreal; June 22, 1901, to June 25, 1902, ticket clerk, Montreal; June 26, 1902, to Dec. 31, 1904, Travelling Passenger Agent, Montreal; Jan. 1, 1905, to Feb. 15, 1907, excursion clerk, General Passenger Agent's office, Montreal; Feb. 16, 1907, to May 10, 1909, Travelling Passenger Agent, Montreal; May 11, 1909, to Jan. 31, 1912, chief clerk, General Passenger Agent's office, G. T. Pacific Ry., Winnipeg; Feb. 1, 1912, to May 25, 1913, chief clerk, Assistant Passenger Traffic Manager's office, G.T.R., Montreal; May 26, 1913, to Feb. 15, 1914, chief clerk, Passenger Traffic Manager's office, Montreal.

W. E. DUPEROW, who has been appointed Assistant General Passenger Agent, G.T. Pacific Ry., Winnipeg, was born at Stratford, Ont., Sept. 4, 1872, and entered transportation service Nov. 3, 1893, since when he has been, to Oct. 15, 1894, in G.T.R. service at Seaforth, Ont.; Oct. 15, 1894, to June 1, 1896, ticket clerk, G.T.R., London, Ont.; June 1, 1896, to July 11, 1898, ticket clerk, G.T.R., Toronto; July 11, 1898, to Aug. 1, 1899, theatrical and excursion clerk, General Passenger Agent's office, G.T.R., Toronto; Aug. 1, 1899, to Apr. 19, 1902, chief clerk, same office; Apr. 19, 1902, to Feb. 15, 1907, General Manager, Secretary and Treasurer, Huntsville, Lake of Bays and Lake Simcoe Navigation Co., Huntsville, Ont.; Feb. 15, 1907, to June 1, 1910, Travelling Passenger Agent, G.T.R., Toronto; June 1, 1910, to Apr. 15, 1912, City Passenger and Ticket Agent, G.T.R. and G.T. Pacific Ry., Victoria, B.C.; Apr. 15, 1912, to Mar. 1, 1914, General Agent, Passenger Department, G.T.R., G.T.P.R. and G.T.P. Coast Steamship Co., Vancouver, B.C.

In our March issue it was stated that J. ALEXANDER HUTCHISON, M.D., had resigned his position as Chief Medical Officer, G.T.R. and G. T. Pacific Ry., and had been appointed Senior Surgeon of the Montreal General Hospital. Dr. Hutchison has not resigned his positions with the G.T.R. and G. T. Pacific Ry., but has, as stated in "Transportation Appointments throughout Canada," in our March issue, resigned as Chief Surgeon of the Central Vermont Ry., owing to pressure of work. He is still Chief Medical Officer of the G.T.R., which position he has held since 1891. During the whole of that time he has been a surgeon to the Montreal General Hospital. As Professor of Surgery and Clinical Surgery in McGill University, he has held the senior teaching surgical service in the hospital for some years, although not the senior in point of appointment or age. The recent resignation of Dr. Shepherd from the hospital staff, while not making any alteration in Dr. Hutchison's position or duties, makes his tenure of office longer than that of any other surgeon on the staff. There is no such position officially as Senior Surgeon on the hospital staff.

ROBERT McCHESNEY SMITH, who has been appointed City Passenger and Ticket Agent, G.T.R. and G. T. Pacific Ry., Detroit, Mich., was born at Milford, Mich., Sept. 14, 1851, and entered railway service, Aug. 9, 1871, since when he has been, to 1875, in general ticket office, Chicago, Rock Island and Pacific Rd., Chicago, Ill.; 1875 to 1876, City Ticket Agent, same road, Chicago, Ill.; 1876, in city ticket office, P. Ft. W. & C. R., Chicago, Ill.; 1876 to 1878, Travelling Agent, same road, Chicago, Ill.; 1878 to Apr., 1883, Travelling Agent and General Travelling Agent, Chicago, Rock Island and Pacific Rd., Chicago, Ill.; Apr., 1883, to 1888, Travelling Passenger Agent, Chicago, Burlington and Quincy Rd., Columbus, O.; 1888 to 1891, same position, Cleveland, O.; 1891 to Apr., 1893, same position, Detroit, Mich.; Apr. to Dec. 24, 1893, Traffic Manager, multiple speed and traction railway in the World's Fair, Chicago, Ill.; Apr., 1894, to May, 1896, Travelling Passenger Agent, G.T.R., Detroit, Mich.; May to Aug., 1896, in General Passenger Agent's office, G.T.R., Montreal; Aug., 1896, to Mar., 1902, Southern Passenger Agent, G.T.R., Cincinnati, O.; Mar., 1902, to June 1908, same position, Detroit, Mich.; June, 1908, to Feb. 16, 1914. Special Passenger Agent in charge of exhibition work, G.T.R., Montreal.

LOUIS CHARLTON FRITCH, who has been appointed Assistant to the President, Canadian Northern Ry., was born at Springfield, Ill., Aug. 1867. He took a course in civil engineering at the University of Cincinnati, and subsequently a law course, and was admitted to the bar in Ohio. He entered railway service in 1884, as supervisor's assistant, Ohio and Mississippi Ry., and was, from Jan. 1, 1886 to Oct. 1892, Assistant Engineer, same road; Oct. 1892 to Nov. 1, 1893, Engineer Maintenance of Way, same road, and was also Chief Engineer in charge of construction, Cincinnati and Bedford Ry.; Nov. 1, 1893, to Sept. 1, 1899, Division Engineer, Baltimore and Ohio Southwestern Rd., which absorbed the Ohio and Mississippi Ry.; Sept. 1, 1899, to Nov., 1902, Superintendent, Mississippi Division, same road; Feb.,

1904, to Mar. 1, 1905, engaged on special work, Illinois Central Rd., Chicago, Ill.; Mar. 1, 1905, to Nov., 1906, Assistant to General Manager, same road; Nov., 1906, to Mar. 1, 1909, Assistant to President, same road; Mar. 1 to Nov. 15, 1909, Consulting Engineer, same road; Nov. 15, 1909, to Mar. 31, 1914, Chief Engineer, Chicago Great Western Rd., Chicago, Ill. He was President, American Railway Engineering Association for the year 1909-10.

GEORGE SPENCER, whose appointment as Chief Operating Officer, Board of Railway Commissioners, Ottawa, was announced in our last issue, was born in London, England, Feb. 21, 1865, and entered railway service July 1, 1880, since when he has been, to Sept. 1, 1880, assistant agent, Toronto, Grey and Bruce Ry., Dundalk, Ont.; Sept. 1, 1880, to Mar., 1881, assistant agent, same road, Markdale, Ont.; Mar. to July, 15, 1881, agent, same road, Waldemar, Ont.; July, 1881, to Oct. 1, 1882, telegraph operator, same road, Toronto; Oct. 1, 1882, to Nov., 1883, dispatcher, same road, Toronto; Nov., 1883, to June, 1884, dispatcher, Ontario and Quebec Ry., Toronto; June, 1884, to Aug. 15, 1887, dispatcher, C.P.R., Toronto; Aug. 15, 1887, to Oct. 1, 1889, dispatcher, C.P.R., Smiths Falls, Ont.; Oct., 1889, to Oct., 1891, dispatcher, C.P.R., Toronto; Oct. 1, 1891, to Nov., 1892, Chief Dispatcher, C.P.R. Smiths Falls, Ont.; Nov., 1892, to Feb., 1898, Trainmaster and Chief Dispatcher, C.P.R. Smiths Falls, Ont.; Feb., 1898, to May 1, 1901, Chief Dispatcher, C.P.R., Smiths Falls, Ont.; May 1, 1901, to May 25, 1903, Chief Dispatcher, C.P.R., Toronto; May 25, 1903, to Nov. 30, 1906, Superintendent, District 1, Ontario Division, C.P.R., Toronto; Dec. 1, 1906, to Jan. 1, 1911, Superintendent, District 1, Lake Superior Division, C.P.R., North Bay, Ont.; Jan. 1, 1911, to Sept. 1, 1913, Superintendent, same district, Sudbury, Ont.; Sept. 1, 1913, to Jan. 31, 1914, Assistant Chief Operating Officer, Board of Railway Commissioners, Winnipeg.

Quebec Bridge.—The foundations for the new Quebec Bridge, particularly the details of the shore piers, were discussed by C. N. Monsarrat, M. Can. Soc. C.E., Chairman and Chief Engineer, Quebec Bridge Commission, before the Toronto branch of the Canadian Society of Civil Engineers, Feb. 25. The lecture was illustrated by slides. Mr. Monsarrat also addressed the Canadian Club, in Montreal, Mar. 2, when the whole bridge was described in a general way, the address being also illustrated with slides. This latter address, being of a general nature to appeal to a non-technical audience, was replete with comparisons with many local landmarks with which the citizens of Montreal are familiar, thereby forcing home the immensity of the project.

Locking of Main Track Switches.—The Board of Railway Commissioners has issued a circular drawing railway officials' attention to the fact that it has from time to time received returns of a number of accidents resulting in serious, and sometimes fatal, injury to employes and passengers, as a result of non-compliance with par. 4 of rule 104, which reads as follows:—"Main track switches must be locked and other switches secured. After a switch is turned, the points must be examined to know that they are in proper position." The circular asks that such action be taken as will ensure strict compliance with the requirements of paragraph quoted.

F. C. WOOD, Commercial Agent, Canadian Northern Ry., St. Louis, Mo., writes:—"I have been reading the Canadian Railway and Marine World for some years and find the articles contained therein most interesting."

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Quebec Ry.—Press reports state that the company is preparing to erect a large coal discharging plant at Quebec and to extend its coal wharf 150 ft.

Mount Royal Tunnel and Terminal Co.—Work was started Mar. 10 on Cathcart St., Montreal, sinking a shaft to the level of the tunnel for the purpose of assisting to get in construction material.

The clearing of the buildings on the blocks bounded by Cathcart, Ste. Monique, Lagauchetiere and Mansfield Streets is being pushed forward. The tenants of the buildings on the north side of Dorchester St., which have been acquired by the company for its terminals in the city, have been notified to leave. It is expected that excavation for the terminals will be started at an early date. The area will be excavated to 50 ft. below the ground level, involving the moving of over 500,000 cubic yards of earth and 95,000 cubic yards of rock. It is estimated that there will be required in the construction of the terminal buildings 100,000 cubic yards of concrete, 3,500,000 lbs. of reinforcing steel, and 8,000,000 lbs. of structural steel.

Montreal-Ottawa-Port Arthur Line.—Press reports state that grading on the unfinished portion of the Ottawa-Capreol section of the line is expected to be completed about Sept 1 and the track laying finished Dec. 30.

Canadian Northern Ontario Ry.—The New York State Legislature has under consideration a bill for the incorporation of the Niagara-Ontario Connecting Bridge Co, to build a bridge across the Niagara River from Lewiston, N.Y., to the Canadian shore, for electric and steam railways. The incorporators are:—E. G. Connette, H. Holden, C. L. Ingham, F. A. Dudley, L. Albright. It is reported that Canadian Northern Ry. interests are associated with this project.

Canadian Northern Ry.—H. K. Wicksteed, M. Can. Soc. C.E., Chief Engineer of Surveys, Mackenzie, Mann & Co., and a representative of the company's legal staff had an interview with the Port Arthur City Council, Mar. 10, to discuss and settle various matters connected with the eastern entrance of the railway and the closing of certain street ends. An agreement is said to have been arrived at as to the closing of the streets, but the matter of the eastern entrance is to be further considered.

Press reports state that the company has under consideration plans for the erection of a new storage shed for incoming freight in the south section of Port Arthur.

It is reported that a new station is to be erected at Kakabeka Falls, Ont., during the summer.

The new station at St. Boniface, Man., has been opened for business.

Press reports state that a number of new sidings are to be put in at the quarries of the Manitoba Gypsum Co. at Gypsumville, Man., during the summer.

It is reported that a spur line is to be built from Radville, on the Maryfield branch, northerly to Weyburn, Sask.

Plans have been deposited in the Land Titles offices at Moose Jaw, Sask., and at Saskatoon, Sask., showing the right of way of the C.N.R. as located through tps. 26-28, ranges 26-29, west of the 3rd meridian.

Press reports state that the company will start construction this year on a line from Brudetheim to Vermillion, thence to Wainwright, and through Medicine Hat to the International boundary between Alberta and Montana. This line is one of the projected lines of the C.N. Western Ry., for the building of which an issue of bonds, guaranteed by the Province of Alberta, was recently placed on the London, Eng., market. A press report states that a contract for building branch lines in Alberta has been let to Foley, Welch and Stewart, Spokane, Wash.

A train service has been put in operation out of Calgary on the newly completed line south from Vegreville, which is joined near Drumheller by a line from Saskatoon, Sask. At present only one station has been opened between Calgary and Drumheller.

Press reports state that it is expected to have about 20 miles of the line south from Calgary to Lethbridge open for traffic this year.

The line from Onoway, Alta., to the Peace River country is completed to the Pembina River, over which a large bridge is under construction. Grading has been completed for a considerable distance beyond the Pembina River. A. T. Fraser, district engineer in charge of construction, was in Edmonton, Mar. 14, and is reported to have stated that considerable further grading will be done during this year.

Canadian Northern Pacific Ry.—The British Columbia Legislature has granted further aid, by means of a guarantee of bonds, for the construction of this railway. The act sets out that in addition to the bonds guaranteed under chap. 3 of the statutes of 1910, the Government is authorized to affix the provincial guarantee to the company's bonds as to principal and interest for $10,000 a mile for the line from the south end of New Westminister bridge to the Yellowhead Pass, 500 miles, and for a line from the north end of the New Westminster bridge to the terminals in Vancouver, 11 miles. The interest on this further issue of bonds is not to exceed 4½%, and the principal is payable April 2, 1950. These bonds are to be secured by a mortgage on the lines mentioned, and are to rank next after the bonds guaranteed under the act of 1910. The act also grants an extension of time to July 1, 1916, for the completion of the lines.

In support of the act the Premier informed the Legislature, Feb. 27, that 16 of the steel bridges across the Fraser and Thompson Rivers, having a total length of 12,214 ft., have been completed. There are still 19 bridges, having an average length of 224 ft., to be completed. The total construction cost of the line is now put at $33,029,200, or about $8,000,000 more than the original estimates. This is accounted for by the high standard of construction required and the increased cost of labor and materials. The extension of time granted applies only to the Okanagan and another branch line, as it is expected to have the main line finished this year.

T. G. Holt, executive agent, is reported to have stated at Ottawa, Mar. 12, that track would be laid on the entire line from the Yellowhead Pass to Vancouver by August.

Vancouver Island Lines.—Referring to the construction of the line on Vancouver Island, the Premier is reported to have said in the Legislature, Feb. 27, that the line from Patricia Bay to Alberni is expected to be completed by the end of this year, although, under the act, the time for completion has been extended to July, 1915. (Mar., pg. 126.)

The ninth annual dinner of the G. T. R. apprentices at the Stratford locomotive shops was held in the G.T.R. Assembly Hall, Stratford, Ont., Mar. 23, R. Patterson, Master Mechanic, occupying the chair. H. G. Kelley, Vice President, and W. D. Robb, Superintendent of Motive Power, were also present.

Canadian Pacific Railway Construction, Betterments, Etc.

Ontario Division.—Tenders are under consideration for the excavation, masonry and concrete work in connection with the double tracking of the bridge across the Humber River at Lambton. The line across this bridge is the only piece of single track between Toronto and Guelph Jct., and all trains have to stop just before reaching it, in order to obtain a clearance order. Gangs of men have been at work since Mar. 1 preparing for the starting of work on the substructure.

The question when the C.P.R. will start work on the union station for itself and the Canadian Northern Ry. in North Toronto depends very much on what action the Toronto City Council takes with regard to the project for widening Yonge St. The station plans are said to have been completed.

Lake Superior Division.—Press reports state that in all about 120 miles of second track work are being put in hand this season, west of Sudbury, on the Lake Superior Division. The building of second track on this division has been in progress for about three years. The work done to date consists of the building of short stretches of second track at various points along the line; and the improvement of alignment and the reduction of gradients, by the building of short lengths of new double track. This work is being continued along these lines, and in due course the various stretches will be connected up in one continuous second track.

The Board of Railway Commissioners has approved plans for the revision of gradients and alignment between a number of points on the Webbwood and Algoma subdivisions.

Saskatchewan Division.—A contract has been let to Dutton and Timson, Winnipeg, for grading on 13 miles of line, 15 miles southwest from Expanse, Sask. Expanse is about 34 miles southwest of Moose Jaw, at the terminus of a branch. The extension will connect up with the line southeasterly from Swift Current, which now has its terminal at Vanguard. The contract involves about 300,000 cubic yards of earthwork.

Press reports state that engineers are on the field making surveys for a line from Instow to Swift Current.

Tenders were received by the Division Engineer, Moose Jaw, to April 1, for the supply of labor and material and to complete all work in connection with the erection of concrete pier and abutments for two steel spans and trestle approach on the line at 8th Ave. West, Moose Jaw; and for the trenching and back filling 8 in. steel pipe line from sec. 9, tp. 84, range 22, west of the 2nd meridian, to Lanigan, Sask., 4.6 miles.

Alberta Division.—A train service is being operated on the Weyburn-Lethbridge line as far west as Shaunavon, Alta. A service has also been put in operation on the Suffield-Retlaw branch as far as Blackie, 57 miles; this is an extension of the service previously in operation to mileage 26.

Rogers Pass Tunnel.—George Bury, Vice President, was in New York recently in connection with the proposed electrification of the double track, 5½ mile tunnel which is being driven in the Selkirk Range. Westinghouse, Church, Kerr & Co. have been retained by the company as engineers to investigate and report on the type of system to be installed, the relative economies of steam and water power, and the effect of the electrification upon operating conditions.

Local press reports state that about six miles of the line on either side of the tunnel will be electrified. There are a number of water powers in the vicinity, any one of which might be utilized to develop power for the operation of the tunnel and approaches.

Kootenay Central Ry.—The Board of Railway Commissioners has approved location plans from mileage 91.85 to 94.81.

Pacific Division.—Press reports state that the company will erect a large storage oil tank at Port Moody, B.C., adjoining which will be a pumping station, that a pipe line will connect the oil tank with the service tanks at Coquitlam, and that a wharf is to be built in connection, so that the oil steamships may lie alongside.

Rapid progress is being made with the erection of the new station at Vancouver, and press reports state that it is expected to have it completed early in May. (Mar., pg. 123.)

Railway Rolling Stock Notes.

The Intercolonial Ry. has ordered 10 Pacific locomotives from Montreal Locomotive Works.

The Canadian Furnace Co. has ordered 2 all steel dump cars, 50 tons capacity, from Eastern Car Co.

The G.T.R. has received 250 box cars from Eastern Car Co., and 61 box cars from Western Steel Car and Foundry Co.

The C.P.R., between Feb. 15 and Mar. 15, received 121 steel frame box cars from its Angus Shops, and 376 steel frame box cars from Canadian Car and Foundry Co.

The Robert McNair Shingle Co., Vancouver, B.C., has ordered a saddle tank locomotive, with cylinders 13½ ins. diar. by 18 ins. stroke, and 70,000 lbs. in working order, from Canadian Locomotive Co.

The Asbestos and Asbestic Co., Asbestos, Que., has ordered a saddle tank locomotive, with cylinders 13 ins. diar. by 16 ins. stroke, and weight in working order 54,000 lbs., from Canadian Locomotive Co.

The Canadian Northern Ry., between Feb. 14 and Mar. 13, received the following additions to rolling stock:—3 first class cars from Canadian Car and Foundry Co.; 25 box cars from National Steel Car Co., and 5 switching locomotives from Canadian Locomotive Co.

Baldry, Yerburgh and Hutchinson, St. Catharines, Ont., who have a contract on the construction of the Welland Ship Canal, have ordered a saddle tank locomotive, with cylinders 15 ins. diar. by 22 ins. stroke, and 80,000 lbs. weight in working order, from Canadian Locomotive Co.

With reference to the recent press reports that the G.T.R. was about to place gas electric cars in service on its Galt and Elmira Branch, Ont., we are officially advised that no such decision has been arrived at. Residents of the district are agitating for a more frequent service and have suggested that the branch be electrified.

The C.P.R., between Feb. 15 and Mar. 15, ordered the following additions to rolling stock:—18 steel frame box cars, 2 vans, 1 stock car, 1 freight refrigerator car, 2 all steel mail and express cars, 60 ft. long, from its Angus Shops; and 40 all steel Otis ore cars from Hart-Otis Car Co., which will be built by Canadian Car and Foundry Co.

The Intercolonial Ry. has received 125 box cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co.; 6 vans from Nova Scotia Car Works; 4 first class passenger cars from Preston Car and Coach Co.; 2 switching locomotives from Canadian Locomotive Co., and 3 consolidation locomotives from Canadian Allis-Chalmers, Ltd.

The Montreal Harbor Commissioners have ordered 15 Otis type all steel general service cars from Hart-Otis Car Co., to be built by the Canadian Car and Foundry Co. Following are the principal dimensions:—

Capacity	50 tons
Length over end sills	38 ft. 9 ins.
Length inside	36 ft. 9½ ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	5 ft.
Height from rail	9 ft. 4 13-16 ins.
No. of doors on each side	6

Following are the principal dimensions of the 40 Otis general service ore cars which the C.P.R. has ordered from Hart-Otis Car Co., and which will be built by Canadian Car and Foundry Co.:—

Capacity	50 tons
Length inside	22 ft. 5 ins.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	5 ft.
Height from rail	9 ft. 4 13-16 ins.
No. of doors on each side	4

The Pacific Great Eastern Ry. has ordered two consolidation locomotives, with superheaters, from Canadian Locomotive Co. Following are the chief details:—

Weight on drivers	156,000 lbs.
Weight in working order, total	176,000 lbs.
Wheel base, rigid	16 ft.
Wheel base, total	24 ft.
Wheel base, engine and tender	60 ft.
Heating surface, firebox	188 sq. ft.
Heating surface, tubes	2,500 sq. ft.
Heating surface, total	2,688 sq. ft.
Driving wheels, diar.	57 ins.
Driving wheel centres	Cast steel
Driving journals, diar. and length	9 by 12 ins.
Cylinders, diar. and stroke	21 by 28 ins.
Boiler, type	Extended wagon top, radial stays
Boiler, pressure	180 lbs.
Tubes, no. and diar.	158—2 ins.; 22—5⅜ ins.
Tubes, length	14 ft.
Injectors	Ohio
Safety valves	Star
Brakes	Westinghouse American
Superheater	Locomotive Superheater Co., Schmidt A
Weight of tender, loaded	144,000 lbs.
Length over end sills	24 ft. 4½ ins.
Capacity, fuel	2,500 imp. galls.
Truck	Equalizer type
Truck wheel, diar.	33 ins.
Truck wheel, type	Steel tired
Journals, diar. and length	5½ by 10 ins.
Brake beams	M.C.B. 2
Capacity, water	6,000 imp. galls.

F. P. Gutelius' Salary, Citizenship, etc.—In the House of Commons, Mar. 4, the acting Minister of Railways, Dr. J. D. Reid, stated, in answer to questions, that F. P. Gutelius, now General Manager Canadian Government Railways, was appointed Jan. 29, 1912, as one of the commissioners to investigate matters connected with the National Transcontinental Ry. construction, that he commenced his duties as commissioner Feb. 1, 1912, his salary being $65 a day, which was paid up to May 1, 1913, when he was appointed to his present position. He was naturalized as a British subject in Montreal, Feb. 23, 1912. His salary as General Manager, Canadian Government Railways, is $20,000 a year, his engagement being for two years from May 1, 1913, and thereafter during the Minister's pleasure.

Marker Light Sockets on Cabooses.—The Board of Railway Commissioners has issued a circular drawing railway officials' attention to the fact that several accidents have happened recently whereby trainmen have been injured while in the act of putting up or taking down marker lights on cabooses, and asking whether railway companies have any, and, if so, what, objection to an order being issued requiring that where cabooses are equipped with marker sockets in the lower position, markers be carried in such lower sockets; that all cabooses hereafter constructed be equipped with marker sockets in the lower position; that all cabooses now in use not equipped with marker sockets in the lower position be so equipped on or before Nov. 1.

National Transcontinental Railway Construction.

The expenditure on the eastern division, to Dec. 31, 1913, exclusive of interest, was stated by the acting Minister of Railways in the House of Commons recently to have been $140,562,147, and the estimated cost of completing the line is $20,745,653. The cost to the Government of the old Quebec Bridge was $6,424,781; the cost of the Royal Commission as to the bridge was $31,765.44; the expenditure to date on the reconstruction of the bridge is $4,889,318.03, and the estimated cost of the completion of the same is $12,000,000. On account of the N. T. Ry., $41,966,890 has been paid out of borrowings, and the remainder out of revenue. The whole cost is a charge to capital account irrespective of the source from whence derived.

A few days previously, the acting Minister of Railways, in giving similar figures, added that $2,448,867 was due to contractors on account of work done. The estimated amount required to complete the line is $18,296,786. The cost of locomotive and freight car shops, but not passenger car shops, at Winnipeg, 16 roundhouses, seven being with machine shops, at different points on the line, was $3,489,166.31. This amount includes what has already been expended and the amount required to complete the work.

A train service was put in operation, Mar. 3, on the section of the line between Levis, Que., and the Quebec-New Brunswick boundary, from St. Anselme to Monk, Que., 80 miles, by the Quebec Central Ry., under an arrangement with the Commission. The Q.C.R. is supplying the rolling stock and is furnishing the train crews. This is a temporary arrangement, and is expected to continue only until the entire section from Levis to the provincial boundary is taken over by the Commission, when it will be operated in connection with the Moncton-Edmundston section.

Tenders are under consideration for the supply of a shavings and sawdust exhaust system for the car shops plant at Transcona, Man. (Mar., pg. 124.)

Grand Trunk Pacific Railway Construction.

A return made to the House of Commons, Mar. 6, shows that the capital of the G.T. Pacific Ry. is $20,000,000 of preferred and $25,000,000 of common stock. The amount subscribed is $1,034,000, of which $1,000,000 is from the G.T.R.; and the amount paid up on account of the shares is $203,600. The company held the following contracts for construction on the National Transcontinental Ry.:—

From Moncton, N.B., westerly, 50 miles; completed, $2,370,398.

From mileage 58 to I.R.C. crossing, about mileage 97.7; amount paid to Dec. 31, 1913, $1,043,312. Total estimated cost, $1,050,000.

From I.R.C. crossing to Tobique River, near mileage 165.7, amount paid to Dec. 31, 1913, $2,790,679. Total estimated cost, $2,840,000.

From 150 miles west of Quebec Bridge to Weymontachene, amount paid to Dec. 31, 1913, $3,169,240. Total estimated cost, $3,180,000.

Eight miles west of Abitibi crossing, easterly, 150 miles; amount paid to Dec. 31, 1913, $5,445,762. Total estimated cost, $6,710,300.

Track laying is being proceeded with westerly from Fort George, B.C., and it was reported at the company's Vancouver offices, Mar. 12, that steel had been laid to mileage 1,310 west of Winnipeg, or 30 miles west of Fort George. The track is also being laid easterly from Prince Rupert, and it was stated, Mar. 12, that the steel had reached a point 89 miles from the point reached by the track laying gang working west. The bridge work yet to be completed will keep back track laying somewhat, but it was expected that the two sections will be joined up early in June, although one report states that the ends of steel will be joined up by April 30. If this is the case, says the report, it will be possible to have trains running through from Winnipeg to Prince Rupert by June 30. The point at which the track laying gangs are expected to meet is Nechaco, 373 miles east of Prince Rupert, and 112 miles west of Fort George. A train service is being operated westerly to Fort George, and easterly to Wardsworth.

Considerable progress has been made with construction on the floating dry dock and shipbuilding plant at Prince Rupert, B.C. Several of the pontoons for the dock are well advanced, and all the filling in and levelling work, which has been in hand at the site for nearly two years, have been completed. A large boiler house has been built and is ready for the installation of the machinery. It is expected that the entire plant will be ready for operation this year.

The excavations for the foundations of the company's hotel at Prince Rupert are going on at a rapid pace.

A train service has been put in operation on the Tofield-Calgary line, between Calgary and Mirror, Alta. It is not expected, however, that a through service between Calgary and Edmonton will be inaugurated until April or May. There is considerable work yet to be done in the yards at Calgary, and the station buildings in use are merely temporary ones, pending the laying out and completion of the permanent yards and buildings on the site of the old police barracks. (Mar., pg. 124.)

The Central Railway of Canada and Its Land Grant Claims.

The Central Ry. of Canada, which has been considerably in evidence during the last few years, particularly on account of its claim to a land grant made in 1855-6 by the old Parliament of Canada, for the building of a railway from Montreal to Georgian Bay, is gradually being freed from the various entanglements which followed the assertion of the claim. One of the matters involved was the railway known as the Carillon and Grenville Ry., which was part of the original project, but which for many years was owned by the Ottawa Navigation Co., and operated by it in connection with its line of steamboats running on the Ottawa River. The O.R.N. Co. was acquired by the C. Ry. Co. of C., but how far it became really a part of the undertaking is uncertain. Anyway the C. and G. Ry. sold its property to Canadian Northern Ry. interests, retaining its charter and charter rights, by a resolution passed July 25, 1911. The O.R.N. Co. questioned the legality of the resolution, alleging among other things that the C. and G. Ry. had no authority to sell and the C.N.R. interests no authority to buy, and that the necessary proceedings prescribed by the Railway Act respecting sales had not been observed. An action was brought in the Quebec courts in the name of the O.R.N. Co. and certain other persons to have the sale set aside, and judgment was given Feb. 28, upholding the sale. During the trial of the action it was shown that 1,900 of the 2,000 shares of the C. and G. Ry. were owned by the O.R.N. Co., and 80 of the remaining shares by Senator Owens, who was at that time the owner or controller of practically the entire stock of the O.R.N. Co. Senator Owens at the meeting of the directors of the C. and G. Ry. when the sale was authorized, voted as representing the O.R.N. Co., in favor of the resolution. The court held that technically, while Senator Owens might not have been authorized to vote for the resolution on behalf of the O.R.N. Co., yet being the owner of the shares voted, the passing of a resolution authorizing him to vote would be a mere formality. The court found that there was nothing in the Railway Act which would prohibit the sale.

The Canadian Northern Ontario Ry. is applying to the Dominion Parliament for an act vesting in it the right of way and other property acquired under the terms of the resolution referred to in the above mentioned action. The right of way so acquired is to form part of the Montreal-Ottawa section of the C.N.R. transcontinental.

The Central Ry. of Canada's application for an extension of time for the building of the various lines authorized, has been approved by the House of Commons. When the measure was before Parliament in 1913 there was a difference of view between the House of Commons and the Senate as to the inclusion of a section prohibiting the company carrying on litigation with a view of securing from Ontario and Quebec certain lands granted in pre-confederation days, which it was claimed were still available for the lines proposed to be built by the company. The following section is included in the present bill:—"It is hereby expressly declared and enacted that the C. Ry. of Canada shall not, nor shall the Ottawa River Ry., the Central Counties Ry., the Ottawa Valley Ry., the Carillon and Grenville Ry., or the Ottawa River Navigation Co., nor the assigns of any of the said companies, nor shall any other company or person whatsoever, be entitled to receive any land grant or grants under the provisions of the statutes of the late province of Canada, 19 and 20 Victoria, chap. 112, and 24 Victoria, chaps. 80 and 87, or any of them, or any amending or substituted acts, or any other statutes or acts of Canada or any of the provinces of Canada." (Sept., 1913, pg. 431.)

Earnings of Canadian Railways Per Mile of Line.

A. P. Landy, A.M. Can. Soc. C.E., Asso. R. Coll. Sc., Ireland, of Benton, N.B., has favored us with the following table which he has prepared from the railway statistics for the year ended June 30, 1913, showing the gross earnings per mile of track for 26 lines, having a length of 100 miles or upwards:—

Name of Railway.	Mileage.	Gross Earnings.	Gross Earnings per mile.
		$	$
Algoma Central & H.B.	133.77	538,580	4,026
Atlantic, Quebec & Western	104.50	41,906	401
British Yukon	101.12	326,348	3,228
Canada Southern	380.04	10,996,494	28,910
Canadian Government:—			
Intercolonial	1,462.48	12,349,296	8,444
Prince Edward Island	279.23	390,461	1,398
Canadian Northern	4,670.65	24,277,478	5,198
Canadian Northern Ont.	500.15	1,280,524	2,560
Canadian Northern Que.	371.02	1,599,546	4,311
Canadian Pacific	11,507.80	130,769,707	11,364
Central Ontario	149.73	375,048	2,505
Dominion Atlantic	279.67	984,497	3,520
Esquimalt & Nanaimo	152.00	931,892	6,131
Grand Trunk	3,103.91	40,424,397	13,025
G.T.R., Canada Atlantic	456.26	2,382,258	5,221
Grand Trunk Pacific	1,395.77	8,162,204	5,848
Halifax & South Western	378.46	531,338	1,404
International of N.B.	112.00	111,932	999
Montreal & Atlantic	163.40	1,104,926	6,762
Quebec Central	253.00	1,571,150	6,210
Quebec Oriental	100.00	101,687	1,017
Quebec & Lake St. John	286.40	959,380	3,350
Quebec, Montreal & Southern	191.91	395,466	2,061
Temiscouata	113.00	250,769	2,219
Timiskaming & Northern Ontario	330.78	1,569,226	2,680
Vancouver, Victoria & Eastern	236.08	994,614	4,213

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The C.P.R. Hotel Palliser at Calgary, Alta., will, it is announced, be opened about May 1.

Fraud Charged in Southampton Railway Constructoin.

The House of Commons agreed, Mar. 9, to a motion for the bringing down of all correspondence and papers relating to the payment of a subsidy to the Southampton Ry. Co. This railway runs from Millville, N. B., to the St. John River, near Pikiok bridge, 12.7 miles, and is being operated by the C.P.R. The company was incorporated by the New Brunswick Legislature, and in 1911 the Legislature voted a guarantee of bonds in aid of its construction at the rate of $10,000 a mile, and in 1913, on account of increased cost of construction, an increased guarantee of bonds for $2,000 a mile was granted. These securities have been issued and sold by the company. The Dominion Parliament, in 1912, voted a subsidy upon the usual terms and conditions in aid of the construction of the line, and on receipt of the necessary certificate that all the conditions had been complied with, paid over a subsidy at the rate of $6,400 a mile, the cost of construction being certified to be $291,517, or considerably more than is required to ensure the payment of what is known as the double subsidy.

The reason for asking for the papers and for an investigation into the matter was stated by F. B. Carvell, M.P., in making the motion. He said that a contract was let by the Southampton Ry. to J. E. Stewart in Sept., 1910, for the construction of the railway in consideration of the bonds, for the guarantee of which the New Brunswick Government had undertaken to secure legislative sanction, and the subsidy to be obtained from the Dominion Parliament. Construction was started under this contract, but in less than three months the company rescinded it, alleging that it had been obtained by fraud. Stewart prepared the plans and specifications upon which the line was built by J. K. Pender for the company, which, after the rescinding of the Stewart contract, consisted of J. K. Pender Geo. Pender, Dr. McNulty, Mr. Gilman, and Mr. Guthrie, a lawyer. With the exception of the latter, all the members of the company were connected with the Pender family.

Upon the rescinding of the contract Stewart brought an action against the company, which did not come to trial until January of this year. The main question of damage has not yet been decided, as the jury disagreed and there is to be a new trial. The hearing of the case lasted 11 days, and Mr. Carvell quoted from evidence given by contractors, engineers and others, which evidence, he said, was not assailed on behalf of the company, showing that the actual sum expended on the construction of the line did not exceed $157,618. Even this amount, he said, was in excess of that actually expended. There were only two items upon which direct evidence of cost was not given, viz.: two steel bridges, and the water tower, and for these liberal estimates were made. When it was remembered, said Mr. Carvell, that this road simply followed the surface; that the engineers used seven degree curves when necessary; that only enough levelling was done to make ditches and a grade of 1½%, it could be understood that there was no necessity for removing solid rock. If they came to a rock they simply went around it. "That is why the road cost only $12,000 a mile," he added. "I did not believe it was possible to build that kind of road, but I went over the route myself, and satisfied myself that my client (Stewart) was right." Wm. McDonald, who built practically the whole line, affirmed in his evidence that he was paid for 4,423 cubic yards of rock work, which was all the rock work done; that there was no earth excavation under water, or any loose rock and hardpan, whereas in the estimates passed on to the Department upon which the double subsidy was paid, the following appeared:—Solid rock, 12,800 cu. yds.; earth excavation under water, 5,500 cu. yds.; loose rock and hardpan, 24,000 cu. yds. The cost of rails was set out at $46,000 in the estimates sent on to the Department, and there was produced at the trial a statement from the C. P.R., and admitted by the Penders, showing the quantity of tracklaying materials supplied and the price of the same. The cost of these, with the additional materials required to complete the tracklaying, which came from the same source, and were of similar quality, worked out at $28,000, while the spikes would cost an additional $1,700.

Amalgamation of Grand Trunk and Canada Atlantic Companies.

The Dominion Parliament is being asked to confirm an agreement between these companies, under which the C. A. R. Co. is to be merged in the G. T. R. Co., and the former is to cease as a separate company. The agreement, dated Feb. 9, 1914, sets out that the G.T.R. is the owner of the 10,000 shares of preferred stock and of 60,725 shares out of a total of 62,000 shares of the ordinary stock of the C.A.R., and provides for the merging in the G.T.R. of all the rights, property, etc., and the taking over of all liabilities of the C.A.R. The schedules attached to the agreement set out liabilities of the two companies, which, under the agreement, become the liabilties of the united company. These are as follows:—

GRAND TRUNK RAILWAY CO.

Description.	Amount.
Borrowed Capital:—	
Second mortgage equipment bonds ...	$ 1,815,266.67
3rd preference bonds Northern Ry. ..	71,053.33
Wellington, Grey & Bruce Ry. Bonds	335,800.00
5½% bonds Great Western (matured) not paid off	486.67
Midland Ry. sectional bonds (matured) not paid off	1,946.67
Midland Ry. consolidated (matured) not paid off	8,273.33
Debenture Stock Grand Trunk	20,782,491.67
" " Great Western	13,252,322.67
" " Grand Trunk	112,538,406.00
" " Northern Ry.	1,499,979.67
	$150,306,026.68
Share Capital:—	
4% guaranteed stock	$ 60,833,333.32
First preference stock	16,644,000.00
Second preference stock	12,312,666.67
Third preference stock	34,884,535.43
Ordinary stock	109,363,053.40
	$234,037,588.82

CANADA ATLANTIC RAILWAY.

Description	Amount.	Held by G.T. Ry.	Held by public.
Borrowed capital:—			
First mortgage ..	$16,000.092	.....	$16,000,092
Share capital:—			
Capital stock ..	$6,200,000	$6,072,500	$127,500
Preference stock..	1,000,000	1,000,000	.....
	$7,200,000	$7,072,500	$127,500

Accidents on Joint Lines.—The Board of Railway Commissioners has decided that in case a railway company grants, or has granted, running rights or joint use of its line, or any portion thereof, to another railway company, and the latter company is concerned in an accident attended with personal injury on the joint section, both companies shall report to the Board, as set out in sec. 292 of the Railway Act and the forms issued thereunder.

Fred. Behan, Assistant Foreman Erecting Shop, G.T. Pacific Ry., Transcona, Man., in remitting renewal subscription for Canadian Railway and Marine World, writes: "Enclosed find postal note to pay yearly subscription to your valuable magazine."

Grand Trunk Railway Betterments, Construction, Etc.

Lachine, Jacques Cartier and Maisonneuve Ry.—Press reports, Mar. 17, stated that it is likely that construction will be started on this projected line during this year. The only matter at present unsettled is the final decision of the Montreal City Council, with respect to the closing of certain streets.

Montreal Track Elevation.—The Montreal City Council took up, on Mar. 16, the question of the cost of the proposed elevation of the G.T.R. tracks between Henri St. and Point St. Charles. The City Solicitor reported that the estimated cost is $6,000,000, towards which the city has authority to contribute $2,000,000. The city does not want to pay any more, but the company thinks it should. In the report on the electric railway situation, the City Engineer's department pointed out that the Montreal Tramways Co. would benefit by the carrying out of the work, and therefore should be asked to pay part of the cost. It is suggested that the Board of Railway Commissioners be asked to apportion the cost between the G.T.R., the Montreal Tramways Co., the City of Montreal and the town of Westmount.

Extensions in Kingston.—Press reports, Mar. 14, stated that some difficulty was being experienced in securing a connection between the foot of William St. and the shipbuilding and other industrial concerns, owing to the sharp curves necessary. The plans for the work are being prepared preparatory to negotiations with the City Council.

New Station Buildings at Bridgeburg, Ont.—We are officially advised that the plans for the proposed new passenger station, customs and immigration offices at Bridgeburg, Ont., are not yet sufficiently advanced to permit of a description being given. Press reports state that the buildings are to cost $75,000, and that work is to be started at once.

Galt and Elmira Branches.—Press reports, Mar. 11, stated that the question of the electrification of the branch running south from Berlin to Galt, and north from Berlin to Elmira, is again under consideration, and that it is probable a start will be made on construction during this year. (Mar., pg. 129.)

Great Northern Railway Lines in Canada.

Vancouver, Victoria and Eastern Ry.—An arrangement has been made with the Kettle Valley Lines and the British Columbia Government, under which the K. V. Line will be built into Princeton, there joining the V. V. and E. Ry. The K. V. Line will then operate over the V. V. and E. Ry. to the point of its junction with the K. V. Line at the starting point of what is known as the joint section, extending down the Coldwater River valley to Hope.

Vancouver Terminals.—A Stewart, Assistant Chief Engineer, G. N. R., reported to Vancouver City Council, Mar. 5, that about 1,750,000 cubic yards of filling was still required to be done on the company's portion of the False Creek flats. The present fill around the site of the proposed station was still 2 ft. lower than the permanent level of the fill. The layout of the tracks had not yet been finally decided.

Work has been started on the reinforced concrete bridges over the railway cut at Victoria road and Broadway East. The first named bridge will be 200 ft. long, and will cost $35,000; the second will be 288 ft. long and will cost $70,000. The city has granted permits for their construction to Grant, Smith and Co. (Mar., pg. 129.)

Dominion Financing for Railway Construction.

In connection with the recent issue on the London, Eng., market of a Dominion Government loan for £5,000,000, the Minister of Finance has given out an official statement in which he says this loan and the other Government borrowings during the past six months are for the following special purposes:—(1) To meet sterling and currency indebtedness of $10,000,000 maturing in October and November last, all of which has been paid off. (2) To pay the special subsidies to the Canadian Northern Ry. under the legislation of last session of Parliament. (3) To purchase 3% bonds of the G.T. Pacific Ry. Co. guaranteed by the Dominion Government, which otherwise would, from time to time, have been sold by the railway company through issues on the London market. The proceeds of these bonds, as purchased by the Government, have been and are being devoted to the construction of the Mountain section of the railway. (4) To advance to the G.T. Pacific Ry Co. the loan of $15,000,000, repayment of which is guaranteed by the G.T. Ry. This loan was authorized by the legislation of last session. The G.T.P. Government-guaranteed debentures referred to in (3) above, and the loan made to the G.T.P. Ry. under the guarantee of the G.T. Ry., are of course assets in the treasury of the Dominion.

The proceeds of the present issue of £5,000,000, underwritten in London, will, after the payment of £1,000,000 of treasury bills, which matured in March, be sufficient to meet the halance of expenditure under the headings mentioned above.

Canadian Ticket Agents Association.—At a meeting of the executive committee in Toronto, Mar. 5, G. W. Vaux, General Agent, Passenger Department, Union Pacific Rd., Chicago, on behalf of the Chicago & Northwestern, the Union Pacific, and the San Pedro, Los Angeles and Salt Lake lines, tendered the members a complimentary trip to Denver, Salt Lake City, Los Angeles and San Francisco, the idea being to start from Chicago Oct. 9, to hold the annual meeting in San Francisco, where three days would be spent and a day in each of the other places mentioned, free transportation, sleeping car berths and dining car service to be provided. The invitation was accepted conditionally upon the C.P.R. and G.T.R. providing free transportation to Chicago and return. The special committees appointed to discuss standardization of railways and steamship tariffs met on the same day.

Cash Proceeds of C. P. R. Stock.—Sir Thomas Shaughnessy, president C. P. R., is 225 lbs. of baggage will be checked without $100 share of the company's outstanding common stock there has been paid into the company's treasury $112.25 cash. In view of the large discount at which it was necessary to sell the original $65,000,000 common stock, upwards of 30 years ago, when the railway was in the course of construction, the showing is remarkable and almost unique in the history of the railways in the world.

Filling in a Trestle by Sluicing.—A culvert under a 170 ft. fill was recently completed on the C.P.R., about 30 miles west of Robson, B.C., where a high trestle on the Cascade tunnel grade has been filled in. The crossing is in a narrow canyon, and it was considered cheapest to sluice the fill material from the adjacent hills by the use of hydraulic giants. The culvert, which is about 500 ft. long, was built up of masonry and has an arched roof with a span of about 12 ft.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414,500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	208,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
Jan.	1,570,900	1,218,000	352,900	82,700
Feb.	1,324,600	1,086,000	238,600	x29,900
	$16,260,400	$11,628,200	$4,632,200	$640,500
Incr.	$ 1,108,400	$ 467,900	$ 640,500	.....

x Decrease.

Average mileage under operation during above period, 4,509, against 4,297 for same period 1912-13.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$11,993,062.27	$7,876,269.09	$4,116,793.18	x$331,383.72
Aug.	11,434,459.88	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,503.96	4,226,821.71	x168,897.80
Jan.	7,916,216.25	6,916,042.19	1,000,174.06	x662,199.72
	$83,202,378.28	$54,990,767.55	$28,211,610.73	x$581,915.20
Incr.	.....	$ 578,494.72	.....	.....
Decr.	$ 3,420.48	.....	$ 581,915.20	.....

x Decrease.

Approximate earnings for Feb., $7,365,000, against $9,526,000 for Feb., 1913.

During February the mileage under operation was increased to 11,920.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T.W.R., and D.G.H. & M.R., for Jan., and increases, or decreases from the figures for Jan., 1913:

	1914	1913	Increase	Decrease
G.T.R.	$5,597,335	$6,017,499	.....	$420,165
C.A.R.	325,102	345,239	.....	20,137
G.T.W.R.	1,039,828	1,108,295	.....	68,467
D.G.H. & M.R.	353,693	345,028	$7,665	.....
Totals	$7,315,958	$7,817,061	.....	$501,103

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for Feb., were $313,492, against $374,084 for Feb., 1913. The aggregate earnings for two months ended Feb. 28, were $681,810, against $751,928 for same period 1913.

Use of Drawing Rooms, Etc.—The Board of Railway Commissioners having ordered suspension of the new regulations as far as concerns traffic between points in Canada, pending a hearing on the subject at Ottawa, which took place Mar. 17, the date for the new regulations becoming effective between points in Canada is postponed until further notice. The new regulations became effective on traffic to, from and between points in the United States on Mar. 15. 300 lbs. and lbs. of baggage will be checked without charge for one person travelling in a drawing room and a compartment, respectively, under these regulations.

Fires Originating Near Railways.—The Board of Railway Commissioners has under consideration the advisability of requesting railway companies to submit monthly, in duplicate, reports on fires originating within 300 ft. of the track and burning over an area of 100 sq. ft. or more outside the right of way. It is reported that the submission of such reports shall be limited to lines or portions of lines to be broadly classified as running through forest sections.

The Algoma Eastern Ry. has been admitted to Eastern Canadian Passenger Association membership.

Supervision of Officials and Employes on C.P.R. Western Lines.

An apparently supplied, or at least inspired, article has been published in some western papers, which mentions the large number of officials and employes on the lines west of Port Arthur, Ont., with some details of the organization, and then says:—

"With a view to bringing the management in as personal touch as possible with all the men employed on this vast transportation system, a new arrangement has been inaugurated by those conducting the company's business. Under this system, the officers will be required to make a report twice a year, in June and December, on the service of every officer and employe under his immediate jurisdiction. Under this report an account will be given of an employe's disposition, attention to business, loyalty, zeal and particularly of the tactful and courteous manner with which he deals with the patrons of the company. Realizing that fairness and courtesy are one of the greatest assets in the success of any company, greater stress will be laid on the degree in which that qualification is possessed. It has been made a rule, however, that should an officer find it necessary to make any adverse comment on the services or qualifications of an employe that employe must be called in, shown the report, and instructed to initial it with any comment he may wish to make. This report will go ultimately to the Vice President. Unfortunately, human nature is not perfect and this means is being adopted to prevent any possibility of a man being 'knocked' without his knowledge; in addition to these reports, a gentleman who is a good judge of human nature, of kindly disposition, whose name has not been divulged to the staff, has been selected who will travel over the road as a passenger, and in that capacity, or as a shipper, or consignee, will come into continual contact with the various employes, and his instructions are to look for the good points in employes and to draw attention to and send in the names of any of the staff whose courtesy, zeal, loyalty, ambition, and knowledge marks them out as above the ordinary, and likely material for advancement."

A Canadian Pacific and Canadian Northern Joint Section in Alberta.

The Alberta Central Ry., a C.P.R. subsidiary, and the Canadian Northern Western Ry., a C.N.R. subsidiary, both of which are building lines west of the Red Deer River to Rocky Mountain House and the Brazeau River coal fields, have agreed that a certain portion of the line is to be jointly owned, and the Dominion Parliament is being asked to confirm this agreement, which is dated June 15, 1913. The lands on which the joint section is to be built extend from the s. e. ¼ of Sec. 22, tp. 29, range 7, west of 6th meridian, to the west limit of sections 18 and 19 in the same tp. and range, and these lands, together with the lines, buildings, etc., to be laid out thereon, are to be known as the joint premises. The C. N. W. Ry. is given joint user of the entire joint premises, with the exception of a spur track to the banks of the North Saskatchewan River; but all maintenance and repairs are to be done by the A. C. Ry. The cost of all works, including a bridge across the North Saskatchewan River, is to be carried to capital account, and the C. N. W. Ry. is to pay interest on 50% of the same at 4½%, and the C. N. W. Ry. will also pay such a proportion of the total of maintenance as is represented by its proportion of the total traffic. The C. N. W. Ry. proposes to extend its line from the westerly end of the joint premises to the westerly limit of range 19 west of the 5th meridian, and it is understood that this extension, or any portion, may be used by the A. C. Ry. on the same terms and conditions as the joint premises. The agreement provides for arbitration in case of differences as to terms.

Standard Rules on the Intercolonial Railway.

A. C. Barker, Inspector Stations, Trains and Train Dispatching, has issued the following circular:—

The operating rules now in effect on the I.R.C. will be superseded by Standard Code of General Train and Interlocking Rules, at 24 o'clock midnight, May 30. The new rule books are being distributed. Employes concerned not receiving a copy should apply to superior officer for same. The following employes must pass written examination in the new rules before date mentioned above, under supervision of instructor or superior officer:—Conductors, engineers, train dispatchers, brakemen, train baggage men, firemen, yardmasters, yard foremen, switch tenders, agents, operators, section foremen, bridge foremen and signal men. Instructors will hold classes at different points on each district, which employes are requested to attend, and obtain explanation of rules not thoroughly understood.

The following instructors in the rules have been appointed:—District 1—A. Dion, T. T. Marchessault, W. H. Toohy. District 2—J. Davidson, E. Smith, N. Sinclair. District 3—B. S. Ward, B. Ripley, W. B. Johnson. District 4—J. J. MacLeod, R. A. McDonald, A. S. Prowse.

I. R. C.—C. P. R. Traffic Agreement.—The acting Minister of Railways informed the House of Commons, Mar. 11, that under the agreement between the Department of Railways and the C.P.R., covering the transportation of freight and passengers between Halifax and St. John, in connection with the C.P.R. and Allan Line steamships carrying the British mails, special freight trains consist of 500 tons contents east bound, and 400 tons contents west bound; special passenger trains are limited to 12 cars all told, including vans, their size being varied according to weather conditions.

Mail Transportation by Railways.—The Postmaster General has informed Canadian Railway and Marine World that, under the new arrangement with the railways, which has been made effective from Feb. 1, payment is to be made by the car mile, as follows:—Full length postal car, 16c. a car mile; half car, 9c; baggage car service, 4c. The arrangement covers the transportation of mails of all classes, including parcels.

Water for Locomotive Purposes on the Trans Australian Ry. is to be obtained by conveying it in wooden pipes from Kalgoorlie for about 257 miles, service tanks being provided every 50 miles. In addition an underground supply has been located by a bore at 344 miles from Kalgoorlie, and from that point water will be pumped to tanks at other points along the line.

Dominion Railway Subsidy Agreements.—The Dominion Government has entered into agreements under the act granting aid for construction as follows,—Burrard Inlet Tunnel and Bridge Co., Feb. 16, for the construction of a bridge over the second narrows of Burrard Inlet; Kettle Valley Ry., Feb. 18, for the construction of a line from between Merritt and Penticton Wharf, to Midway, 135 miles.

Dominion Government Interior Terminal Elevators.

In the House of Commons recently, the Minister of Trade and Commerce gave the following information as to Government elevators, completed, under construction and under consideration. Applications have been received for the establishment of elevators from Calgary, Lethbridge, Edmonton, Alta.; Prince Albert, Broadview, North Battleford, Melville, Wolseley, Sask.; and Portage la Prairie, Man. It has been decided to build elevators at Moose Jaw and Saskatoon, Sask., and Calgary, Alta., and the requisite sites have been obtained for each place. At Moose Jaw and Saskatoon, the site was acquired from the municipality for the nominal price of $1 in each case, and for Calgary the site was transferred from the Department of Militia. The elevators at Moose Jaw and Saskatoon are under construction, but no others have been placed under contract. The Moose Jaw elevator is being built by the Barnett-McQueen Co., and will have a working house capacity of 500,000 bush., with storage capacity of 3,000,000 bush. The Saskatoon elevator under construction by the same firm is of the same capacity, and the estimated totals of the contracts is $2,005,620.

In reply to questions regarding the operating of these and other elevators to be built, and the charges to be made in connection therewith, it was stated that when they are more nearly approaching completion, and when the time comes for transactions with reference to them, all these matters will be taken up by the Board of Grain Commissioners.

Regarding the Government elevator at Fort William, Ont., is is reported that the receipts of grain between Oct. 16, 1913, the date on which it was opened for business, and Jan. 31, 1914, were 6,950,206 bush., and the shipments 5,278,115 bush. The gross earnings were $61,394.56, and the operating expenses $33,517.73. It has a capacity of 3,250,000 bush., and cost $1,372,000.23.

Dominion Government Railway to Hudson Bay.

An Order-in-Council was passed, Mar. 2, vesting in the Department of Railways and Canals certain lands for trackage and ballast pits in connection with the railway under construction from Pas to Port Nelson, Man. The lands, 235.70 acres in extent, are situated in tp. 25, range 26 west of the 1st meridian. (Mar., pg. 119.)

Trade with Portugal.—Frederic Nicholls, Consul for Portugal, Toronto, has received the following letter from the Lisbon Commercial Association:—"Being desirous of enlarging our commercial business, especially the foreign one, the directors of the association have approved of the installation of a room for catalogues of the most important commercial houses in the world, in order to have our business men acquainted with prices of all articles in the world's market, and for the above reason we ask you to be kind enough to invite, by the most practical means, the commercial houses of your district that export their products to present their catalogues to the association." Catalogues should be addressed to "Associacao Comercial de Lisboa, Lisbon, Portugal.

During January, 9 employes were killed and 4 were injured in the course of their work on railway construction in the Dominion, and 16 were killed and 89 were injured in general steam railway service.

The Late George Westinghouse.

George Westinghouse, who died of heart disease in New York, Mar. 12, was born at Central Bridge, N. Y., Oct. 6, 1846. His father was an inventor, who, in 1856, removed his family to Schenectady, N. Y., where he established the Schenectady Agricultural Works. The boy attended the public and high schools of the town, spending much of his leisure time, after studies, in his father's machine shop. Before he was 15 he invented and made a rotary engine, and passed at an early age the examination for the position of Assistant Engineer in the U. S. Navy, in which he served from 1863 to 1865.

In 1865 he invented a device for replacing railway cars upon the track, which was made of cast steel, at Troy, N. Y. Going to Troy one day, a delay caused by a collision between two freight trains, suggested to him the idea that a brake under the control of the locomotive driver might have prevented the accident. His first thought was an automatic brake attached to the couplers, which was unsuccessful. This was followed by steam, which proved also to be unsatisfactory, because by the time it reached the brake from the engineer's cab it lost its power. He saw an account of the use of compressed air in digging the Mont Cenis tunnel, and after much study and investigation, the use of compressed air further impressed itself on him. Drawings of the air pump, brake cylinder and valves were made, but considerable time elapsed before a practical trial of the brake was obtained. The first patent was issued April 13, 1869, and the Westinghouse Air Brake Co. was formed on July 20 following. Many changes and improvements were being made in the brake all the while, the business flourished, and the manufacturing works, begun in 1869, were completed in 1870. In 1870 he went abroad to introduce the air brake in England —a difficult problem, as the trains in Europe had hand brakes upon only the brake vans, there being no brakes upon the other vehicles. Not only did this require the spending of seven years in Europe, between 1871 and 1882, but it taxed his inventive ability considerably to meet the new conditions of railway practice. In the meantime, he invented the automatic feature of the brake which overcame the imperfections in the first form, and removed the danger from parting of trains on steep grades. In 1886, he invented the quick action brake, the improvement being made in what is known as the triple valve. By this valve it became practicable to apply all brakes on the train of 50 freight cars in two seconds.

About 1880, he became interested in the operation of railway signals and switches by compressed air, and soon after there was developed and patented the system now manufactured by The Union Switch & Signal Co.

In 1886 the Westinghouse Electric Co. was formed for the manufacture of lamps and electric lighting apparatus, Mr. Westinghouse having become interested in the subject. The business rapidly developed and in 1889 and 1890 this company absorbed the United States Electric Co., and the Consolidated Electric Light Company. In 1891 all these properties were reorganized into the Westinghouse Electric & Manufacturing Co., which owns extensive works at East Pittsburgh, employing over 22,000 people.

In 1895 the Electric Co. outgrew its small quarters and moved to East Pittsburgh and the same year works of the British Westinghouse Co. were established at Manchester.

The question of the steam turbine and its applications was investigated by Mr. Westinghouse and he secured the patent rights of C. A. Parsons of England in 1897-98. This development of a new prime mover soon led him to consider the use of the turbine as a prime mover for ships. The trouble was the high speed. He then developed and brought out the mechanical reduction gear for reducing the inherently high speed of a turbine to the slow speed of a ship propeller or direct current dynamo. He also occupied himself with the development of an air spring for automobiles and motor trucks.

He rendered an invaluable service to electrical development when, in spite of opposition, ridicule and many efforts to crush his alternating current system, he remained steadfast in his belief that this class of high tension transmission would make distant electrical distribution possible. This system his engineers developed, and in this connection secured Nicola Tesla, in 1887, who invented the alternating current induction motor. A struggle almost identical with that of the earlier fight for alternating current transmission is the recent development of alternating current traction by means of the single phase motor. In spite of the same opposition, Mr. Westinghouse achieved a far step in electric railway practice which the electrical world was quick to follow just as in the case of alternating current transmission.

Owing to his many achievements in mechanics, electricity, steam and gas, his name was known the world over, and he had many honorable distinctions conferred upon him for his achievements and in recognition of the services he rendered the various branches of engineering. His alma mater, Union College, Schenectady, conferred upon him the degree of doctor of philosophy. He was decorated with the order of the Legion of Honor, with the order of the Royal Crown of Italy, with the order of Leopold of Belgium. He was the second recipient of the John Fritz medal. He received the degree of doctor of engineering from the Koenigliche Technische Hochschule of Berlin, Germany. He was an honorary member of the American Society of Mechanical Engineers, of which body he was President in 1910. He was one of the two honorary members of the American Society for the Advancement of Science. He was an honorary member of the National Electric Light Association of America. He was awarded the Scott premium and medal by the Franklin Institute of the State of Pennsylvania. He received the Edison gold medal for meritorious achievements in the alternating current system of electrical distribution. He received the Grashof gold medal from the Society of German Engineers in Germany, which acknowledged him the greatest American engineer.

He was connected with a large number of industries at home and abroad, many of which bore his name. He was President and director of Westinghouse Air Brake Co., Westinghouse Machine Co., Nernst Lamp Company, Union Switch & Signal Co., Canadian Westinghouse Co., Societe Anonyme Westinghouse, Paris., Cooper Hewitt Electric Co., Pittsburgh Meter Co., Societe Italiane Westinghouse, Italy, East Pittsburgh Improvement Co., Westinghouse Brake Co., London, Westinghouse Cooper Hewitt Co., London, Westinghouse Friction Draft Gear Co., Westinghouse Metal Filament Lamp Co., London. He was also Chairman of the Board of Directors of Westinghouse Electric Co., London, and Director Westinghouse Electric & Manufacturing Co., Traction & Power Securities Co., Westinghouse Metallfaden Gluhlampenfabrik, Vienna. The Westinghouse companies employ 50,000 men, on whom 150,000 persons are dependent. The total capitalization of all the companies is $200,000,000. Although actively associated with a large number of industries, he had during the last few years begun to transfer his responsibilities to the shoulders of his trusted lieutenants, the fortunate selection of which had always been one of the leading characteristics of his varied career. His death, therefore, will not cause any material change in the policy or operation of the companies so indelibly linked with his name.

Regulations Respecting the Removal of Regular Station Agents.

Canadian Railway and Marine World for March contained an order passed by the Board of Railway Commissioners, Jan. 31, respecting the removal of regular station agents, the complaints on which it was based having reference to certain specified stations west of Port Arthur, Ont. On Feb. 19 Assistant Chief Commissioner D'Arcy Scott gave the following decision which was concurred in by Commissioners McLean and Goodeve:—

"For some weeks past the Board has received many complaints from places in the Western Provinces where permanent agents had been established by railway companies, that the agent was being removed and the station being turned into a flag station. So numerous were these complaints, that the Board thought it proper to issue General Order 119, requiring railway companies which intend to remove a permanent agent from a station and make the station a flag station, to first notify the local municipality, or board of trade, of its intention to apply to the Board; and, then send in to the Board an application for permission to close the station, with a statement of the grounds upon which action was to be taken. When a railway company opens a station and appoints a permanent agent there, business in that locality is built up on the assumption that the station will continue to be a permanent station. The Board thinks it proper that it should be consulted, and that those representing the public should be heard before such a station is closed by a railway company. The services given by a railway company at a station where there is a regular agent, and at a flag station, are very different; and, it may amount to a great hardship to a community to suddenly have its station closed. The Board has no intention of interfering with a railway company in practising economy by closing a regular station, if the facts of the particular case warrant such action; but, as the closing of a station has such a material effect upon the interests of the public who have been using that station, the Board should have an opportunity of determining in each case upon its own merits whether the railway company would be justified in closing a regular station or not. At the hearing, the point of view of the railway companies was clearly set forth. We realize the necessity for prompt action in all cases where it is reasonable that a company should be permitted to close a regular station. No general rules can be laid down. Each case will have to be dealt with on its merits. The intention of the Board in issuing General Order 119 was that it should apply only to cases where the company desired to close a regular agency station and make that station a flag station. It was not intended to apply to cases where a special agent had been temporarily employed to look after some particular class of business which was of a temporary nature. No order is necessary in this case."

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Eastern Ry.—A. J. DONEGAN, heretofore Division Superintendent, Algoma Central and Hudson Bay Rd., Hawk Jct., Ont., has been appointed Superintendent, A.E.R., vice P. Robinson, transferred. Office, Sudbury, Ont.

Canada Steamship Lines, Ltd.—J. J. NELLIGAN has been appointed Division Freight Agent, Montreal.

C. W. BATH, heretofore Assistant Ticket Agent, Richelieu and Ontario Navigation Co., Toronto, has been appointed Passenger and Excursion Agent, Canada Steamship Lines, Toronto, vice S. J. Murphy, resigned. He will report to H. D. Paterson, General Agent, Passenger Department, Toronto.

PERCY GRANT has been appointed Division Freight Agent, Hamilton, Ont.

H. B. BROWNELL has been appointed Division Freight Agent, Winnipeg.

F. W. GARDINER has been appointed District Freight Agent, Calgary, Alta.

B. C. TUCKER has been appointed Division Freight Agent, Cleveland, Ohio.

Canadian Car Service Bureau.—J. REILLY, heretofore acting Manager, has been appointed Manager. Office, 401 St. Nicholas Bldg., Montreal.

Canadian Government Railways.—H. H. SCHAEFER having retired from the service, the position of Division Freight Agent at Moncton, N.B., has been abolished, and agents in New Brunswick, Moncton north and east, report to the General Freight Agent, Moncton.

Canadian Northern Ontario Ry.—H. THOMPSON has been appointed Locomotive Foreman, Parry Sound, vice J. Quinn.

Canadian Northern Ry.—L. C. FRITCH, heretofore Chief Engineer, Chicago Great Western Rd., Chicago, Ill., has been appointed Assistant to the President, C.N.R.

M. A. THOMSON, heretofore Travelling Freight Agent, Hamilton, Ont., has been appointed City Freight Agent, Ottawa.

G. A. KEELER has been appointed acting Manager, Prince Edward Hotel, Brandon, Man., vice E. Hutcheson, Manager, resigned.

F. CLARKE has been appointed Locomotive Foreman, Calgary, Alta.

A. H. SWEETMAN has been appointed Car Foreman, North Battleford, Sask.

Canadian Pacific Railway.—L. C. ORD, heretofore General Car Inspector, has been appointed Assistant Master Car Builder, vice P. A. Crysler. Office, Montreal.

G. W. GEHAN, heretofore storekeeper at Place Viger, Montreal, has been appointed storekeeper at Sortin Yard, Montreal, vice J. McDonald.

W. KENNY has been appointed storekeeper at Place Viger, Montreal, vice G. W. Gehan transferred.

F. W. NICKS has been appointed acting District Master Mechanic, District 2, Manitoba Division, vice P. S. Lindsay, on leave of absence. Office, Winnipeg.

G. T. COLEMAN, heretofore Chief Dispatcher, Moose Jaw, Sask., has been appointed Chief Dispatcher, Winnipeg, vice E. G. Trump, transferred.

E. G. TRUMP, heretofore Chief Dispatcher, Winnipeg, has been appointed Chief Dispatcher, Moose Jaw, Sask., vice G. T. Coleman.

J. GRAHAM has been appointed Assistant Roadmaster, District 2, British Columbia Division, North Bend, vice G. Wharton, transferred.

G. WHARTON, heretofore Assistant Roadmaster, District 2, British Columbia, North Bend, has been transferred to Nelson.

C. E. PHELPS, heretofore Soliciting City Passenger Agent, Baltimore and Ohio Rd., Washington, D.C., is reported to have been appointed Southern Travelling Passenger Agent, C.P.R., with office at New York.

Central Vermont Ry.—MARCUS ALEXE, heretofore Soliciting Passenger Agent, Montreal, has been appointed Canadian Freight and Passenger Agent, vice A. C. Stonegrave, deceased, as reported in our last issue. Office, 122 St. James St., Montreal.

Grand Trunk Pacific Ry.—W. E. DUPEROW, heretofore General Agent, Passenger Department, G.T.R., G.T.P.R. and G.T.P. Coast Steamship Co., Vancouver, B.C., has been appointed Assistant General Passenger Agent, G.T.P.R. Office, Winnipeg.

C. E. JENNEY, heretofore City Passenger and Ticket Agent, G.T.R., Toronto, has been appointed General Agent Passenger Department, G.T.R., G.T.P.R. and G.T.P. Coast Steamship Co., in charge of territory in British Columbia, Rivers Inlet and South, vice W. E. Duperow, promoted. Office, Vancouver, B.C.

The following station agents have been appointed:—Pope, Man., R. W. Gibson; Unt. Man., C. L. Bennett; Spy Hill, Sask., H. G Boulger; Young, Sask., H. B. Briggs; Allan, Sask., M. R. Stirling; Bradwell, Sask., P. L. Harper; Asquith, Sask., O. Hawthorn; Juniata, Sask., G. S. Bass; Reford, Sask., T. Hutchings; Tofield, Alta., A. G. Sinclair; Stony Plain, Alta., E. B. Elgood; Dandurand, Alta., H. S. Creelman; Jasper, Alta., H. L. Gurwell; Mirror, Alta., D. W. Mathers; Trochu, Alta., F. C. Taylor; Calgary, Alta., A. B. Dowling; Terrace, B.C., O. E. Nash; Pacific, B.C., W. Norris; New Hazelton, B.C., T. S. Constantine; Prince George, B.C., H. F. Bickford; Wordsworth, B.C., R. A. Pake.

Grand Trunk Ry.—W. S. THOMPSON, heretofore connected with the Montreal press, has been appointed on the General Advertising Agent's staff, for the preparation of publicity articles.

W. J. MOFFATT, heretofore Travelling Passenger Agent, Toronto, has been appointed City Passenger and Ticket Agent there, vice C. E. Jenney, transferred to G. T. Pacific Ry.

S. R. JOYCE, heretofore ticket clerk, Toronto, has been appointed Travelling Passenger Agent there, vice W. J. Moffatt, promoted.

W. F. SHARPE has been appointed Chief Dispatcher, Brantford, Ont., vice E. O. Dunn, transferred.

R. McC. SMITH, heretofore Passenger Agent, has been appointed City Passenger and Ticket Agent at Detroit, Mich., vice C. M. Harwood, resigned.

R. KELLEY, heretofore Trainmaster, District 26, Detroit Division, Battle Creek, Mich., has been appointed Trainmaster, Districts 27 and 28, Detroit Division, vice G. B. Perdue, resigned on account of illness. Office, Durand, Mich.

E. O. DUNN, heretofore Chief Dispatcher at Brantford, Ont., has been appointed Chief Dispatcher at Durand, Mich.

ROY BULLEN, heretofore General Agent, Chicago Great Western Rd., Winnipeg, has been appointed General Agent, Freight Department, G. T. R., Minneapolis, Minn.

F. A. RUTHERFORD, heretofore Chief Dispatcher, London, Ont., has been appointed Trainmaster, District 26, Detroit Division, Battle Creek, Mich., vice R. Kelley, transferred.

The following agents have been appointed:—Britannia Mills, Que., T. A. Leclerc; St. Bazile, Que., H. M. Houde; Aubrey, Que., H. D. Reynolds; Glen Huron and Nottawa, Ont., W. Brethauer; Burlington, Ont., W. W. Langford; Winona, Ont., W. W. Weafer; Port Colborne, Ont., O. P. Seeman; Ravensworth, Ont., H. Desarmia.

Great Northern Ry.—L. W. HILL, Chairman of the Board, has been elected President, vice Carl R. Gray, resigned. Office, St. Paul, Minn.

A. R. BROOKS, heretofore agent at Brandon, Man., has been appointed District Freight and Passenger Agent, Montreal, vice W. T. Hetherington, transferred.

W. T. HETHERINGTON, heretofore District Freight and Passenger Agent, Montreal, has been appointed District Freight and Passenger Agent, Winnipeg, vice A. Brostedt, resigned.

Adams Express Co. has been appointed General European Traffic Manager, vice H. G. McMicken, heretofore European Traffic Agent. Office, 25 Cockspur St., London, Eng.

Intercolonial Ry.—W. A. COWAN, A.M. Can. Soc. C.E., heretofore Superintendent, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., has been appointed Resident Engineer, Halifax Ocean Terminals, I.C.R.

(See also Canadian Government Railways.)

Manchester Liners, Ltd.—H. D. STOKER, heretofore in the office of the Vice President in charge of Steamship Lines, C.P.R., Montreal, has been appointed Westbound Traffic Agent, Manchester Liners. Office, Montreal.

Moncton and Buctouche Ry.—We are officially advised that no appointment will be made to the Superintendency, left vacant by the recent death of F. N. Hall, the work being undertaken by the General Manager. E. G. EVANS. Office, Moncton, N.B.

New York Central and Hudson River Rd.—IRA H. HUBBEL, heretofore General Freight Agent, has been appointed Assistant Freight Traffic Manager, N.Y.C. & H.R.R., West Shore Rd., and Ottawa and New York Ry., vice H. D. Carter, deceased. Office, New York.

WILLIAM A. NEWMAN, heretofore General Freight Agent, Lake Shore and Michigan Southern Ry., Cleveland, Ohio, has been appointed General Freight Agent, N.Y.C. & H.R.R. and West Shore Rd., vice Ira H. Hubbel, promoted. Office, New York.

Southern New England Rd.—J. M. MORRISON, Engineer and Superintendent of Structures, Central Vermont Ry., has also been appointed Chief Engineer, S.N.E.R., vice H. R. Safford, Chief Engineer, G.T.R., who has resigned from S.N.E.R. service. Office, St. Albans, Vt.

Stopping Trains in their own Length.—A most important development of the air brake was demonstrated in recent experiments on the Pennsylvania Rd., when a 12 car steel train, nearly 1,000 tons in weight, running 60 miles an hour, was stopped within its own length of about 1,000 ft. The new Westinghouse brake may be operated with pneumatic or electric control, and it embodies among other improvements two shoes for each wheel instead of one, as at present. The new apparatus shortens the time of obtaining the maximum brake capacity from 8 seconds in the present system to 3½ seconds. With electric control, the time is shortened to 2¼ seconds. It was shown that a 12 car steel train running 80 miles an hour could be stopped within 2,000 ft.

Canada has not too many transcontinentals. With only 10% of the area of the country under crop, more railways and more wide-spreading railways are the chief means of development, and are a national necessity.—Toronto Globe.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

21387. Feb. 16.—Ordering C. N. Ontario Ry. to build a permanent under crossing, not less than 15 ft. wide and 13 ft. high, at west bent of trestle through H. Ray's farm, March Tp.

21388. Feb. 21.—Authorizing C.P.R. to use 9 bridges on its Havelock, St. Thomas, Toronto, Hamilton and London Subdivisions, Ont.

21389. Feb. 21.—Authorizing C. N. Ontario Ry. to build spur for Sun Brick Co., York Tp.; to be completed within six months.

21390. Feb. 21.—Authorizing G.T.R. to use bridge 346, mileage 198.46, Napanee, Ont.

21391. Feb. 23.—Approving detail plans of Edmonton, Dunvegan and British Columbia Ry. bridge to be built across Athabasca River at mileage 131 west of Edmonton.

21392. Feb. 23.—Authorizing Young village, Sask., to build Dublin St. across C.P.R.

21393. Feb. 23.—Amending order 19033, Apl. 11, 1913, re building highway bridge over G.T.R. in Murray Tp., Ont.; and re apportionment of cost between G.T.R. and Campbellford, Lake Ontario and Western Ry. (C.P.R.).

21394. Feb. 23.—Ordering C.P.R. to flag all train movements over crossing of Atwater Ave., Montreal, and to locate highway crossing sign so that good view of it can be had when crossing is being approached in either direction.

21395. Feb. 14.—Approving City of Toronto plan showing bridge to be rebuilt over G.T.R. and C.P.R. at Strachan Ave.

21396. Feb. 24.—Amending order 21290, Jan. 29, re G.T.R. protection of crossing near Hastings Station, Ont.

21397. Feb. 23.—Authorizing G.T.R. to rebuild bridge 63 over Madawaska River, at milepost 171.41, near Arnprior, Ont.; provided pier to be abandoned be lowered to 3 ft. below low water mark.

21398. Feb. 23.—Approving proposed changes in Vancouver, Victoria and Eastern Ry. and Navigation Co.'s main line, part of original section east line section 15, Tp. 16, to west line Tp. 26, B.C.

21399. Feb. 23.—Approving C. N. Alberta Ry. stress sheet and general design of bridge at mileage 209.3, across Stony River, Alta.

21400. Feb. 20.—Authorizing Toronto, Hamilton and Buffalo Ry. to divert two highways between Lot 5, Con. 12, and Lot 5, Con. 13; and Lots 6 and 5, Con. 12; to build a right angle crossing halfway between the two present crossings; and rescinding order 20134, Aug. 16, 1913, in so far as it authorizes highway diversion between Lot 5, Con. 12, and Lot 5, Con. 13, Pelham Tp., Ont.

21401. Feb. 24.—Approving locations of C.P.R. stations at Millicent and Rosemary, Alta.

21402. Feb. 24.—Suspending, pending investigation by Board, increased minima on building papers and pulpwood published in Supplement 40 to C.P.R. tariff C.R.C. No. E. 23543, and Supplement 28 to G.T.R tariff C.R.C. 2513.

21403. Feb. 24.—Authorizing C.P.R. to build road diversion at grade across its main line, Medicine Hat Subdivision, Alta.

21404, 21405. Feb. 24, 26.—Further extending, to May 31, time within which sidings for Otis-Fensom Elevator Co., Hamilton, Ont., be completed; and to June 30 for completion of those for Godson Contracting Co., in Darlington Tp., Ont.

21406, 21407. Feb. 24.—Authorizing C.P.R. to build spur for International Harvester Co., Lethbridge, Alta.; and extension to siding for C. S. Hyman Co., London, Ont.

21408. Feb. 26.—Authorizing McKim Tp., Ont., to build highway crossing over C.P.R. in Lot 9, Con. 5.

21409. Feb. 26.—Limiting speed of G.T.R. trains over crossing of Long St., Chesley, Ont., to 10 miles an hour.

21410, 21411. Feb. 24.—Authorizing G.T.R. to build extension to siding for British American Oil Co., Toronto; and siding for Stevens Bros. and Holmes, Chaffey Tp., Ont.

21412. Feb. 24.—Authorizing Canadian Northern Ry. to build spur for Alberta Agencies, Edmonton, Alta.

21413. Feb. 27.—Suspending, pending investigation by Board, tariffs of G.T.R., Wabash Rd., Central Vermont Ry., Rutland Rd., Michigan Central Rd., Toronto, Hamilton and Buffalo Ry., C.P.R and Quebec Central Ry., requiring additional railway tickets for exclusive use of drawingrooms or compartments in sleeping or parlor cars.

21414. Feb. 9.—Approving C.P.R. detail plans of subways to be built on its Forsyth Branch at Desjardins St., Pie IX. Ave., Jeanne D'Arc, D'Orleans, Bourbonniere, Charlemagne, Lasalle and Latourneux Sts., Maisonneuve, Que.

21415. Feb. 23.—Relieving G.T.R. from providing further protection at the crossing of third public road west of Chatham station, Ont.

21416. Feb. 26.—Authorizing Kaministiquia Power Co. to build temporary trestle and sluice way across Canadian Northern Ry., 1,390 ft. west of Kakabeka Falls station, Ont.

21417. Feb. 27.—Approving Edmonton, Dunvegan, and British Columbia Ry. plan for 50 ft. half deck plate girder span of bridge to be built over Athabasca River, mileage 131 west of Edmonton, Alta.

21418. Feb. 14.—Authorizing C.P.R. to build spur on Harbor Quay, Goderich, Ont.

21419. Feb. 24.—Amending order 20817, Nov. 11 1913, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) undercrossing for A. R. Farewell, Oshawa, Ont.

21420. Feb. 27.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build bridge 88 across Trent River, Trenton, Ont.

21421. Feb. 27.—Authorizing Esquimalt and Nanaimo Ry. to build across Anderson Logging Co.'s line near mileage 33 of E. & N.R. extension from McBride Jct. to Courtenay; crossing to be protected by interlocking plant.

21422. Feb. 26.—Amending order 21137, Dec. 31, 1913, re Toronto Civic Car Line crossing of G.T.R. spur on Danforth Ave.

21423. Feb. 28.—Authorizing C.P.R. to use bridges 15.69 and 103.7.

21424. Feb. 28.—Authorizing C.P.R. to build its Bassano easterly branch at grade across road allowances at mileage 97.8 and 92.8, Alta.

21425, 21426. Feb. 27.—Authorizing C.P.R. to build spurs for J. J. Perrigo and Calgary Brewing Co., Swift Current, Sask., and for Crown Feed and Produce Co., Calgary, Alta.

21427. Feb. 27.—Rescinding order 20407, Sept. 23, 1913, re Kettle Valley Ry., in so far as it directs a crossing at west boundary of M. W. Smith's farm, Beaverdell, B.C.

21428. Feb. 27.—Amending order 19546, June 10, re Hamilton St. Ry. crossing of Toronto, Hamilton and Buffalo Ry. at Main and Trolley Sts., Hamilton, Ont.

21429. Mar. 2.—Extending to May 31 time within which G.T.R. shall complete siding for Harris Abattoir Co., Hamilton, Ont.

21430. Feb. 24.—Approving Bell Telephone Co. agreement, Feb. 7, with Corporation of Waterloo, Tp., Ont.

21431. Feb. 28.—Ordering G.T.R. to stop train 69 on flag signal at Glanford station, Ont.

21432. Mar. 2.—Amending order 21310, Feb. 4, re C.P.R. ballast pit spur crossing road allowance at La Fleche, Sask.

21433. Mar. 2.—Authorizing C.P.R. to use bridges 00.2, 60.6, 63.3 and 0.3.

21434. Mar. 3.—Rescinding order 21402, re suspension of Supplement 40 to C.P.R. Tariff C.R.C. no. E-2353, and ordering that Supplement 41 to C.P.R. Tariff no. E-2353 be in effect from Feb. 25.

21435. Mar. 3.—Authorizing C.P.R. to build road diversion in Sec. 3, Tp. 23, R. 28, W. 3 M., Sask.; and to build its Swift Current northwesterly branch across same at mileage 101.07.

21436. Mar. 3.—Ordering C.P.R. to maintain station agent at Ralph, Sask.

21437. Mar. 3.—Authorizing C.P.R. to build extension to trackage for Crown Grain Co., Winnipeg.

21438. Mar. 3.—Relieving G.T.R. from providing further protection at crossing of Main St., just east of Thorndale station, Ont.

21439. Mar. 3.—Authorizing Hamilton St. Ry. to cross G.T.R. and Hamilton Radial Ry. at grade on Kenilworth Ave.

21440. Mar. 3.—Ordering American Ex. Co. to establish a 23c. rate from Springfield to Hamilton, Ont., to become effective by April 3.

21441. Mar. 3.—Establishing express collection and delivery limits in Edmonton, Alta.; and rescinding order 20072, Oct. 31, 1913, in same connection.

21442. Mar. 4.—Relieving G.T.R. from providing further protection at Goodwillim's crossing, 1¾ miles west of Georgetown, Ont.

21443. Mar. 3.—Ordering Kootenay and Alberta Ry. to grade west approach to bridge, in Sec. 7, Tp. 6, R. 1, w. 5 m., Alta., for about 300 ft., and extend guard rail for about 150 ft., to be completed by June 15.

21444. Mar. 4.—Ordering C.P.R., within 60 days, to install improved type of automatic bells at crossing of Kyle and Queen Sts., Port Moody, B.C.; 20% of cost to be paid out of "the railway grade crossing fund."

21445. Mar. 4.—Authorizing Nepean Tp., Ont., to build highway crossing over C.P.R. at Second Ave.

21446. Mar. 5.—Authorizing clearance, as shown on C.P.R. plan, between standard coal sheds and rail of side tracks.

21447. Mar. 6.—Amending order 17264, Aug. 21, 1912, re C.P.R. spur to Sims' ballast pit, Sask.

21448. Mar. 6.—Authorizing C.P.R. to build its Swift Current northeasterly branch across highway, at mileage 98.47, between Secs. 5 and 6-23-27, w. 3 m., Sask.

21449. Mar 5.—Approving revised location of C.P.R. Bassano easterly branch, from Sec. 17-21-18, easterly to Sec. 21-22-8, w.4 m., Alta., at mileage 0 to 72.07.

21450. Mar. 7.—Authorizing G.T.R. to rebuild bridge 49, mileage 123.75 from Black Rock, over public road between Lots 5 and 6, Con. 1, Fullarton Tp., Ont.

21451. Mar. 6.—Ordering G.T.Pacific Ry. to appoint a regular station agent at Cudworth station, Sask.

21452. Mar. 9.—Authorizing Usborne Rural Municipality, 310, Sask., to open crossing over C.P.R. Pheasant Hills Branch at mileage 260.8.

21453. Mar. 9.—Declaring that land applied for at Tappen, B.C., in Little Shuswap Indian Reserve no. 5, is required by C.P.R. for railway purposes, and is land which, were it the property of a private owner, could be taken without owner's consent.

21454. Mar. 9.—Authorizing C.P.R. to rebuild bridge 37.6 over Saugeen River, Walkerton Subdivision, Ont., and rescinding order 20604, Sept. 25, 1912.

21455. Mar. 9.—Approving location of C.P.R. station at Cadillac, Sask.

21456. Mar. 9.—Authorizing G.T.R. to use 2 bridges, no. 12, mileage 48.98, and no. 13, mileage 49.20, District 30, Quebec.

21457. Mar. 9.—Authorizing C.P.R. to use bridges 24.1, St. Guillaume Subdivision, Que.; 22.5, Newport Subdivision; 32.6, Ottawa Subdivision, and 44.7, Ottawa Subdivision, Ont.

21458. Mar. 9.—Authorizing C.P.R. to build spur for T. W. Murray, Vaughan Tp., Ont.

21459. Mar. 10.—Approving location of C.P.R. station at Shaunavon, Sask.

21460. Mar. 9.—Approving revised location of portion of Kootenay Central Ry. from mileage 91.85 to 94.81, and authorizing crossing of Laurier and Borden Sts., Athalmer, B.C.

21461. Mar. 9.—Ordering C.P.R. forthwith to reopen station at Dunkirk, Sask., and reappoint station agent there.

21462. Mar. 9.—Relieving Pere Marquette Rd. from providing further protection at crossing of public road just west of Renwick station, Ont.

21463. Mar. 10.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. to build spur for British Columbia Milk Condensing Co. at Guichon, B.C.

21464. Mar. 9.—Authorizing C.P.R. to build its Weyburn-Stirling Branch across highways between mileage 232.523 and 253.34.

21465. Mar. 10.—Approving revision of grades and alignment on C.P.R. Webbwood and Algoma Subdivisions, Lake Superior Division, Ont.

21466. Mar. 9.—Ordering C.P.R., within 90 days, to install improved type of automatic bell at crossing of White Lake Road, Pakenham, Ont., switching movements on sidings to be flagged over crossing by train crew.

21467. Mar. 11.—Authorizing Lake Erie and Northern Ry. to operate for 90 days, for purposes of construction only, across Grand Valley Ry. at station 372.60, near Paris, Ont.

21468. Mar. 12.—Amending order 21345, Feb. 11, re C.P.R. bridge 18.71, over Battle River, Alta.

21469. Mar. 12.—Approving locations of C.P.R. stations at Notukeu and Pontiex, Sask.

21470. Mar. 10.—Extending time for completion of siding for Whiteside and Arnold, Barrie, Ont., for 90 days from date.

21471 to 21473. Mar. 12, 11.—Authorizing G.T.R. to use bridge 168 across Thames River immediately west of London, Ont., bridge across Elgin St., Brantford, Ont., and bridge 30, crossing River St., Paris, Ont.

21474. Mar. 10.—Authorizing Cedar Rapids Mfg. and Power Co. to extend its right of way for transmission line to 125 ft. in St. Polycarpe and St. Ignace du Coteau du Lac parishes, Que.

21475. Mar. 12.—Ordering G.T.R. to discontinue yard limit at Algonquin Park station, Ont., within 60 days; if it desires to discontinue use of locomotive whistle at station it shall, within 20 days, file plans for approval of Board, showing signal system to be established there and instructions as to operating same, either by electricity or by hand.

21476. Mar. 11.—Authorizing G.T.R. to use bridge over viaduct, near Port Hope station, Ont.

21477. Mar. 13.—Authorizing C.P.R. to build its Lacombe-Easterly Branch of Calgary and Edmonton Ry. across highway at mileage 188.26, Sask.

21478. Mar. 12.—Authorizing G.T.R. to build siding for Canadian Clarendon Marble Co., St. Johns, Que.

21479. Mar. 13.—Authorizing C.P.R. to build spur for Canadian General Electric Co., Calgary, Alta.

21480, 21481. Mar. 13.—Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build spur at mileage 1.11 (spur mileage), Trenton, Ont., across C.N. Ontario Ry. at two points.

21482. Mar. 12.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) diversion as built at mileage 01.18 from Glen Tay; and rescinding order 18282, Dec. 11, 1912, in same connection.

21483. Mar. 13.—Approving location of G.T. Pacific Branch Lines Co.'s station at mileage 63 on Moose Jaw Northwest Branch, at Siding 11, in Sec. 26-22-6, w. 3 m., Sask.

21484. Mar. 14.—Authorizing G.T.R. to connect with Dominion Iron and Steel Co.'s siding, Point St. Charles, Montreal.

21485. Mar. 13.—Postponing cancellation of special mileage rates on grain for milling and export, as published in C.P.R. Supplement 3 to C.R.C. no. E-2,715 and G.T.R. Supplement 16 to C.R.C. no. E-2,566; and ordering that special mileage rates, as published in Sec. 3 of C.P.R. Tariff C.R.C. no. E-2,715, and Sec. 4 of G.T.R. Tariff C.R.C. no. E-2,566 be continued for one year from March 20, and granting leave to the companies to apply to Board at end of period for revision of rates.

21486. Mar. 13.—Ordering G.T.R. to install, within 90 days, improved automatic bell at cross-

ing of highway immediately west of Lorne Park station, Ont., 20% of cost of installation to be paid out of railway grade crossing fund.

21487. Mar. 13.—Authorizing C.P.R. to build spur for Adolph Lumber Co. at Baynes Lake, B.C., to install derail 300 ft. from crossing of Great Northern Ry. and connect it with interlocking plant, to be completed within six months.

21488. Mar. 16.—Authorizing C.P.R. to build road diversion under main line in Sec. 5-14-23, at Carmangay, Alta.

21489. Mar. 14.—Authorizing C.P.R. to use bridges 62.8 and 79.1, Windsor Subdivision, Ont.

21490. Mar. 14.—Authorizing G.T.R. to use bridges 144, 90, 40 and 39, District 15, Middle Division, Ont.

21491. Mar. 16.—Approving G.T.R. plans showing location and details of freight shed and platform to be built at Prairie Siding, Ont.

21492. Mar. 16.—Amending order 20940, Dec. 3, 1913, re location of C.P.R. Swift Current Northwesterly Branch, Sask.

21493. Mar. 17.—Ordering C.P.R., within 60 days to install improved automatic bell at crossing of County Road no. 14, Hillsburg, Ont., 20% of cost to be paid out of the railway grade crossing fund.

21494. Mar. 16.—Authorizing C.P.R. to build spur for W. T. Williams and J. W. Davidson, Medicine Hat, Alta..

21495, 21496. Mar. 17.—Authorizing C.P.R. to build its Bassano Easterly Branch across highway between Secs. 5 and 6, Tp. 23-1, at mileage 112.47; also across highway between Secs. 25 and 26-21-6, w. 4 m., Alta., at mileage 83.6.

21497. Mar. 16.—Authorizing Esquimalt and Nanaimo Ry. to build spur to Newcastle Lumber Mills, at Newcastle, B.C., at mileage 6.64 on Comox Extension.

21498. Mar. 17.—Authorizing C.P.R. to rebuild bridge 109.36, Mountain Subdivision, B.C.

21499. Mar. 17.—Ordering C.P.R., by June 1, to erect shelter at Groverton, Ont., for passenger accommodation.

21500. Mar. 17.—Approving revised location of C.P.R. main line, as built from mileage 24.76, at Savona, to mileage 30, and from mileage 32 to 40.62, at Semlin, B.C.; and authorizing double tracking on same and across 4 highways.

21501. Mar. 16.—Authorizing G.T.R. to build bridge 266, at mileage 48.25, over Credit River, near Inglewood, Ont.

21502. Mar. 16.—Authorizing G.T.R. to build siding in Macauley and Draper Tps., Ont., for I. C. McLeod.

21503. Mar. 16.—Authorizing G.T.R. to use bridge 130, over Nith River, mileage 75.64, near Princeton, Ont.

21504. Mar. 17.—Authorizing G.T.R. to rebuild 9 bridges on District 4, Que.

21505. Mar. 16.—Approving Canadian Northern Ry. revised location through Sec. 19-2-6, and Sec. 24-2-7, w. 2 m., Sask., mileage 0 to 1.43; and authorizing crossing of road between said sections.

21506. Mar. 16.—Approving G.T.R. plans of superstructure of 8 bridges, District 13, Ont.

21507. Mar. 17.—Ordering G.T.R. by June 15 to install gates at St. Clair Ave., Toronto, Ont., to be operated by day and night watchmen; 20% of installing gates to be paid by railway grade crossing fund, remainder, 1-3 by city, and balance by company.

21508. Mar. 14.—Ordering G.T. Pacific Ry. to make certain changes in highway crossings in Tp. 34, R. 1 and 2, w. 3 m., Sask.; to be completed by May 31.

21509. Mar. 16.—Authorizing G.T.R. to build siding for Chalmers Milling Co., west of Dawes Road, Toronto.

21510. Mar. 16.—Approving G.T.R. plan of proposed arrangement for lighting vehicular and pedestrian roadways on Victoria Bridge, Montreal; work to be completed within 3 months.

21511. Mar. 17.—Authorizing Canadian Northern Ry. to build across and divert public road between n.e. ¼ Sec. 33-28-20 and n.e. ¼ Sec. 4-29-20; to divert highway between n.e. ¼ Sec. 32-28-20 and n.w. ¼ Sec. 34-28-20 to new crossing in n.e. ¼ Sec. 33, w. 3 m., at station 5684+20.2.

21512. Mar. 17.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to make right of way for transmission line, 125.9 ft. wide, across Lot 338, St. Joseph de Soulanges Parish, Que.

21513. Mar. 16.—Authorizing London and Lake Erie Ry. and Transportation Co. to connect with Michigan Central Rd., at west end of St. Thomas, Ont.

21514. Mar. 17.—Authorizing G.T.R. to rebuild overhead bridge carrying Westminster Road over its line in London Tp., mileage 121.58 from Suspension Bridge, Ont.

21515. Mar. 18.—Approving Marconi Wireless Telegraph Co. of Canada's Tariff C.R.C. 8, covering new rates for cable and weekend letters; same to be filed in form prescribed under order 6679 (general order 32), Mar. 26, 1909.

21516. Mar. 17.—Amending order 21,417, Feb. 27, re Edmonton, Dunvegan and British Columbia Ry. plan for bridge over Athabasca River at mileage 131 west of Edmonton, Alta.

21517. Mar. 18.—Amending order 17400, Aug. 30, 1912, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) right of way.

21518. Mar. 18.—Ordering C.P.R. by April 1 to restore old clearance by raising underside of top of culvert 11 ins. between mileage 24 and 25, just north of Flower station, Ont.

21519. Mar. 19.—Amending order 21418, Feb. 14. re C.P.R. spur at Harbor Quay, Goderich, Ont.,

21520. Mar. 16.—Authorizing City of Montreal to build 8 ft. steel water pipe under, across and along G.T.R., Montreal, to be used as emergency supply for city.

21521. Mar. 19.—Authorizing C.N. Ontario Ry. to build trestle across Indian River, Fraser Tp., at mileage 101 from Ottawa.

21522. Mar. 19.—Ordering C.P.R. to stop train 22 on flag, daily except Sunday, at St. Clet, Que.

21523. Mar. 20.—Authorizing C.P.R. to take certain lands in Lot 6, Con. 4, west of Hurontario St., Toronto Tp., for enlarging station yard at Streetsville Jct., Ont.

21524. Feb. 26.—Authorizing G.T.R. to build siding for Terminal Warehouse and Cartage Co., west of Common St., Montreal, and rescinding order 9859, Mar. 9, 1910.

21525, 21526, Mar. 20.—Authorizing G.T.R. to use 16 bridges on District 30, Ont., and bridge on District 16, across Birch Ave., Hamilton, Ont.

21527. Mar. 23.—Amending order 19958, Aug. 8, 1913, re crossing of certain highways in Maisonneuve, Que., by C.P.R. Forsyth St. Branch.

21528. Mar. 20.—Authorizing C.N. Ontario Ry. to take portions of Lots 81 and 82, Ste. Dorothee Parish, Que.

21529. Mar. 21.—Relieving C.P.R. from providing further protection at crossing of Government Road, Mortlach, Sask.

21530. Mar. 23.—Authorizing G.T.R. to build 2 bridges 138, mileage 91.90, near Woodstock, and 7, mileage 6.15, near Weston, Ont.

21531. Mar. 21.—Authorizing C.P.R. to use bridge 2.65 on its Prescott Subdivision, Ont.

21532. Mar. 23.—Amending order 21508, Mar. 14, re G. T. Pacific Ry. crossings of highways in Saskatchewan.

General Order 121 rescinding general order 109, re carriage of trunks containing personal effects by freight, as from March 1.

General Order 122 rescinding general order 116, Dec. 24, 1913, re increased minimum railroad weights on certain grain and root traffic.

General order 123, Mar. 19.—Approving form "Release of Responsibility," no. 981, respecting carriage of clothing, wearing apparel and personal effects, all secondhand, in trunks, securely corded, submitted by Canadian Northern Ry., and ordering that said form be applicable to all railway companies under Board's jurisdiction until ordered otherwise.

Telegraph, Telephone and Cable Matters.

The Timiskaming and Northern Ontario Ry. Commission is reported to have purchased the Elk Lake Telephone and Telegraph line, which was owned by A. J. Reece, Elk Lake, Ont.

The Canadian Northern Telegraph Co. has opened an office at Fairlight, Sask., and has installed telephones at Bayard, Ettington, Gravelbourg, Mazenod, Michellton, Palmer and Spring Valley, Sask.

The Western Union Telegraph Co. has deposited plans for works proposed to be erected on certain land, and land covered by Water in Halifax harbor, N. S., the property being known as the Market wharf.

The Dominion Government has completed the laying of a cable connecting Pender and Saturna Islands, and is also laying cables connecting Halfmoon and Buccaneer bays, across Welcome Pass, and from London Island to Savary Island. A telegraph office has been opened at Britannia Beach on the line connecting Vancouver and Squamish, B. C.

A. B. Smith, Manager of Telegraphs, G. T. R. and G. T. Pacific Ry., is on a trip of inspection through the west to arrange details for the rapid completion of existing telegraph lines, and extensions in connection with the commercial telegraph service. It is anticipated that the telegraph line will be completed between Winnipeg and Prince Rupert shortly, a small gap only having to be filled.

The report with recommendations in the arbitration respecting telegraph operators' wages on the Pere Marquette Rd., issued at Detroit, Mich., Mar. 1, grants to operators in towns with a population of 15,000 or more, who have been receiving $70 a month, or less, an increase of $5 a month; to operators in cities with a population of less than 15,000, who have been receiving $60 a month or less, an increase of $2.50 a month. Overtime is to be paid at a rate derived by dividing the monthly rate by the monthly hours, with a minimum of 25c. per hour, instead of an all round 25c. an hour as heretofore.

It is announced that the extensions of the C. P. R. telegraph system in British Columbia during this year, will include the continuation of the line along the Esquimalt and Nanaimo Ry., from Nanaimo to Courtenay, connecting Qualicum Beach, Union Bay, Cumberland and Comox, and the erection of an additional wire between Nanaimo and Alberni. Another line will be erected between Golden and Windermere, 95 miles, along the Kootenay Central Ry., and the line in the Okanagan Valley will be rebuilt.

Among the Express Companies.

S. O. Martin has been appointed agent, Canadian Northern Ex. Co., at Ottawa, where an office has recently been opened.

The Dominion Ex. Co. has closed its offices at Bittern Lake, Dauntless, Ensign, Keoma, Mazeppa, Seebe and Spring Coulee, Alta.

The Board of Railway Commissioners has rearranged the express delivery and collection limits for Edmonton, Alta.

F. W. Holland has been appointed General Agent, Canadian Northern Ex. Co., Montreal, vice E. C. Miner, acting General Agent there, who has resigned.

The Canadian Northern Ex. Co. has recently opened offices at Rockville Jct., Caffeys Locks, Cumberland, La Framboise, Ottawa, Richmond, L'Orignal, Orillia, Rockland, Smiths Falls, Perth Road and Portland, Ont.; Rockyford and Calgary, Alta.

The Dominion Express Co.'s Traffic Manager, W. H. Burr, has sent the following circular to agents: "We are going to issue, from time to time, short letters containing information on subjects relating to transportation, and particularly with regard to the service of the express companies, which we think will be of interest to employes, and which may assist them in answering questions, or in discussing such subjects with patrons. We shall be glad to receive suggestions from employes, and will take pleasure in answering personal requests for information desired on any particular point relating to the service. This is not to be a correspondence school, but merely an effort to get into personal touch with those who are interested, to the end that we may be able to place ourselves fairly before the public and be prepared to meet the adverse comments of those who don't know."

The first letter sent out deals with parcel post vs. express service. It says:—

Do not knock the parcels post; it has come to stay; it fills a long felt want to those who are willing to perform the greater part of the service themselves, who are willing to assume all the risks of loss or damage, who do not consider time of very great importance. On the other hand, the express companies are necessary to those who desire the personal service, protection in transit, pick-up and delivery, the saving of time, the prompt payment for goods lost or damaged, the option of prepaying or having the charges collected from the consignee, the collection of the purchase price upon delivery (c.o.d.), the privilege of stopping goods in transit, and the innumerable special services which are performed by express agents and employes. It is a business proposition. Where there is a difference in the charge, the higher charge will not be paid unless it is justified by superior service or advantages. On the other side, we give you the schedules of the parcels post rates, also the charges by express on parcels weighing up to 6 lbs. Make our service worth the price and go after the business.

Electric Railway Department

The Sherbrooke Railway and Power Co.'s Electric Railway System.

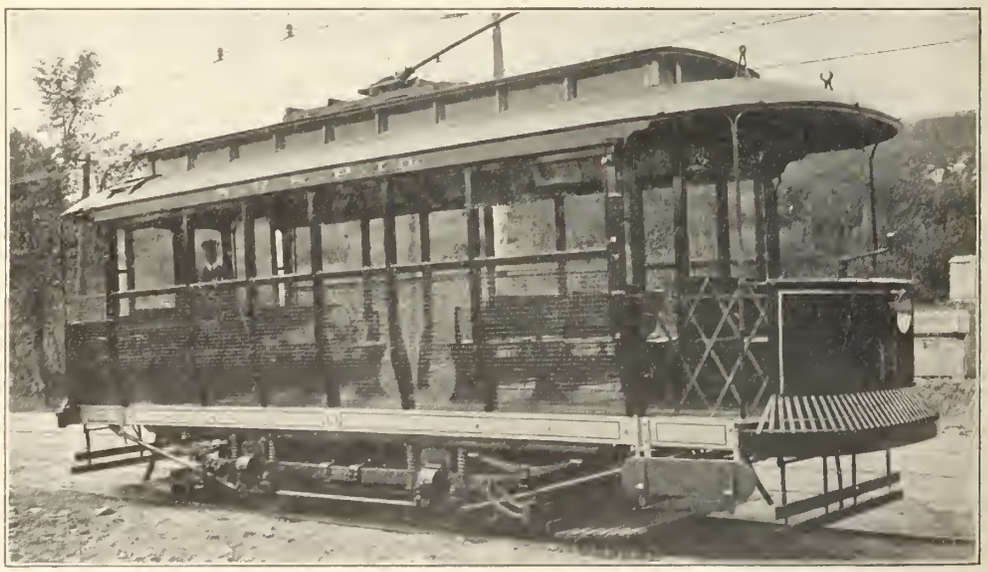
The Sherbrooke Railway and Power Co. operates a railway of about 11 miles around Sherbrooke, Que., with a suburban extension to Lennoxville, three miles. It also conducts a power and electric lighting business, in competition with the municipal organization.

Latest Type of Nearside Pay-as-you-enter Car, Sherbrooke Ry. and Power Co.

The street railway property first operated under the name of the Sherbrooke St. Ry. Co., under a charter granted by the Quebec Legislature in 1895, when the population of Sherbrooke was about 9,000. For some years the railway was operated in a perfunctory manner, and allowed to lapse into a state of decay, largely due to it not being considered a profitable property, and not worth developing. In 1909, when the gross earnings on a small mileage with limited rolling stock were only $31,222, the Sherbrooke Ry. and Power Co. was incorporated by the Quebec Legislature, to take over the property and franchises of the Sherbrooke St. Ry., as well as certain water power rights held by the British American Land Co., an old English company then being wound up. The resultant combination produced a public utility company with a wide field of activity.

At the time of the combination, Sherbrooke had a population of about 17,000, and in view of the contemplated rapid development of the city, due to the influx of numerous industries, it was proposed to reconstruct practically the whole system, and replace nearly the whole of the rolling stock, bringing the line up to date, as it was felt that by so doing the property would become profitable. This reconstruction has been carried out, with new power plant, road bed, and practically all new car equipment.

Sherbrooke now has a population of over 18,000, which is rapidly increasing as mentioned, due to the rapid influx of new industries, and the growth of existing enterprises. It is the central point of the old United Empire Loyalist settlement called the Eastern Townships, and is one of the very few settlements in Quebec in which the English element predominates. The country surrounding the city is very fertile, and supports a prosperous farming community. All these features contribute to the welfare and development of the city. In consequence, the railway policy at the time of the amalgamation was planned with this future prosperity in view. At the time of the amalgamation, a 5 mile extension to Brompton, a city of 12,000 population, and a further 8 mile extension to Windsor Mills, with 4,000 population, were considered, but it was not decided to proceed with these lines, and nothing has been done in this connection.



Open Car Converted for Nearside Prepayment, Sherbrooke Ry. and Power Co.

The extent of the local system is shown in the accompanying plan of the city. The system covers the whole city area most thoroughly, and in a manner that is not excelled in many small railway properties. With the exception of the portion of the is a recent subdivision, and in consequence may be counted out, every section of the city is within a short walking distance of a street railway track.

The system consists of five lines, as follows:—Belt, Frontenac, Newington, Park city to the south of the C.P.R. line, which and Lennoxville, all but the latter being exclusively local. The Belt Line operates four cars normally, on a 10 minute headway, the cars running in both directions around the belt. The route followed is along Wellington, Dufferin, Queen, Wolfe, Belvidere, King, Alexander, Aberdeen, Depot, King, and then back along Wellington St. The reverse belt runs in the opposite direction. This is the principal line of the system, embracing the main residential district, and passing through the main business section of the city, which is along Wellington St., north of King St. In addition, this line passes directly in front of the union station, through which pass the trains of the G.T.R., Quebec Central Ry., and Boston and Maine Rd. It is also the line nearest to the C.P.R. station near the back of the city. The starting point, and one of the turnouts for the line, are at the local offices and waiting room on Wellington St.

The Frontenac line operates one car only, and in a sense is a one way belt line, the starting point being the waiting room, following Wellington, Frontenac, Wolfe, Portland, Ontario, Beckett, Dufferin, and then along Wellington St. to the starting point. This line operates on a 20 minute headway.

The Newington line, operating one car, connects the centre of the city with Newington, a small suburb in the southeast section of the city, where the Quebec Central Ry. shops are located. From the corner of Wellington and King Sts. a car leaves every 20 minutes, following King St. across the bridge, and then along Bowen Ave. and Lennoxville St. to the Q.C.R. shops, where the line loops back. A complete round trip is possible in the 20 minutes with a short stop at each end.

The Park line, operating one car, leaves from the same point as the Newington line,

at exactly half time with regard to the Newington car movements. This line follows King St. to Pine St., which it follows to the exhibition grounds, where it loops back, making the round trip in 20 minutes. This is the busiest line of the system during the fair week. Sherbrooke has the distinction of holding the largest fair in Eastern Canada every fall—The Eastern Canada Exhibition, which draws big crowds, taxing the line to its capacity.

The Lennoxville line is the only radial line of the system, and operates two cars on a 15 minute schedule, between Sherbrooke and Lennoxville. Starting from the corner of King and Wellington Sts., the line follows the latter to the road along the east bank of the St. Francis River, parallel to the G.T.R. line, to Lennoxville, where it terminates in the centre of the village. It follows the side of the highway, and maintains a very high schedule speed for the class of traffic handled.

All the lines of the system are single track, with turnouts located at such intervals as to minimize the waiting at meeting points. This is essential, as it will be seen from an examination of the operating times mentioned earlier, that the lines all operate on a pretty quick schedule for a small system.

The layout of the system has been largely dependent on the physical characteristics of the city. The hills on either side of the St. Francis River at this point are quite steep. The streets paralleling the river are comparatively level, but those running at right angles to it are for the most part very steep. Following the courses of the various lines a minimum grade has been obtained in rising from the lower level, in the heart of the business section along the west bank of the river, to the upper residential sections. The heaviest grade is up King St., the second street of the city, and in consequence, it has been considered inadvisable to run the cars straight up this street, the belt line cars making a detour two blocks to the south, thereby obtaining an easier ascent.

The system is laid with 72 lb. rail, 7 in. section, and with the exception of a very small portion the track is in an almost perfect condition. In all there are 11 miles of line. The trolley wire in the city system is 00 grooved copper. On the Lennoxville line an experiment in line material was tried about a year ago, and has given the best of satisfaction. This 3 mile line required trolley wire renewal. It was decided to try a steel wire of similar size to the copper one formerly in use, so ⅜ in. steel wire was obtained for a short section of the line. This was obtained in stock lengths, and welded together at the ends in the shops. This proved quite satisfactory, but it was found that the wire, coming as it did from stock, was rough, and could not be straightened perfectly, and in consequence the wear on the trolley wheel was more than it ought to be. The use of the steel wire was sufficiently satisfactory to warrant the completion of the whole line. Before doing so, an order was placed for smooth, clean wire from the mill in desirable lengths. This wire has proved most satisfactory, and it is claimed that there is practically no wear to the trolley wheels. What wear does occur is due principally, it is claimed, to the first section of rough stock wire. The old copper trolley wire was suspended from the spans, 12 ins. off centre, and connected with the trolley wire at every span by flat steel bars, 16 ins. long, which were forged in the shops in spare moments. The copper trolley, in a single subway through which the line passes, was replaced by a steel bar, ½ by 2 ins., which gives good results. The operation of this section of the line has been most satisfactory, and a new trolley line has been obtained at about one tenth the cost of a new copper one. By the use of the old line as an additional feeder alongside, the resistance

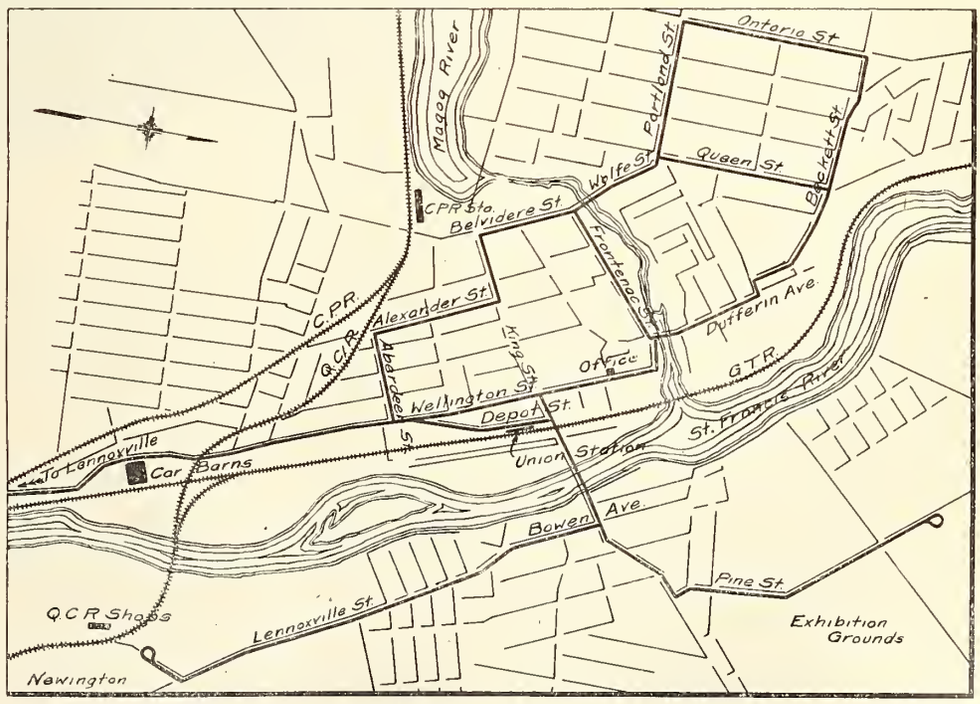
P247 N. C. Pilcher,
General Manager, Sherbrooke Railway and Power Co.

of the line is, if anything, reduced. On all curves on the city lines, as well as cross-overs, similar steel wire is used.

Power for the railway lines is obtained from two 250 k.v.a. motor generator sets, receiving a.c. power at 2,000 volts, and delivering from the d.c. end at 550, which is the distribution pressure through the system.

The company's buildings consist of the office building and the car sheds. The offices are in a theatre building near the north end of Wellington St., with waiting room and operating office on the ground floor, opening to the street, and staff office above. The frame car barns are near the south end of the town on the Lennoxville line, backing on the G.T.R. tracks. They have a capacity for 20 cars, the layout consisting of 5 tracks, each holding 4 cars.

The rolling stock consists of 21 cars, all of which are single truck, with the exception of a double truck sweeper. One of the latest additions to the equipment is shown in an accompanying illustration of one of the new nearside, prepayment cars, which are in almost general use on the system. On a small system, during the major portion of the day, the traffic is very light, and the question of a few men's wages often means the difference between profits and the passing of a dividend. It generally devolves itself into a question of the advisability of decreasing the service, and thereby reducing traffic by causing people to walk, or else putting on an expensive, frequent service to entice traffic. On this system, after considerable study, it was believed that just as good, if not superior, service could be given with a one man car crew. So, in Dec., 1912, most of the cars were changed over from the rear entrance type, that entrance being blocked, and another door added at the front of the car, the front one of which is for entrance, and the other for exit, the entering passengers passing in front of the motorman-conductor, who proceeds without having to await for a signal, as soon as the passengers have entered the car. The Frontenac, Newington and Park lines were all equipped with this service, which proved so satisfactory that last summer the Belt line was also given the same kind of service. It has not been considered advisable to change over the Lennoxville service, as these cars operate on a very fast schedule, and require two men. In order to secure a better class of men for this more responsible single service, the company raised their pay 4c. an hour. As a result of the new operation, since its installation, there has not been a single accident, no doubt due to the centralized control, both entrance and exit being directly under the observation of the motorman-conductor.



The Sherbrooke Ry. and Power Co.'s Lines in Sherbrooke.

The interruption to service is practically negligible.

Most of the cars are of the closed type shown, the older cars being of the same general design as the newer equipment. When the change to the nearside operation was made, it was desired to convert four open cars for this service, and the manner of doing so is shown herewith. These cars may still be used for double end operation. All the cross seats were cut down, so as to form a side aisle, half way on either side. The side steps were removed, and the sides barred with a wire screening made of no. 10 wire, on a 1¼ in. mesh, completely closing in the car body. A door was cut in each bulkhead, and at each end a folding gate and step provided, the step being folded up and the gate closed on the rear end of the car, so that the entry and exit of passengers is still under the motorman-conductor's observation as in the closed car. The car bears out the statement of the chairman of the Quebec Utilities Commission, that it is "the safest open car in existence."

Following are some operating statistics for the year ended June 30, 1913:—Operating expenses to gross earnings, 77.22%; car mileage, 448,144; gross earnings per car mile, 10.746s.; operating expenses per car mile, 8.299c.; passengers carried, 1,115,038; transfer passengers carried, 220,809. The heaviest week of the year is at exhibition time, as mentioned. During the last exhibition the railway receipts for the week were $3,200, with a single day record in the same period of $1,000. This traffic was handled with 13 cars.

The operating officials are N. C. Pilcher, General Manager, and J., B. Woodyatt, Power Superintendent, to the former of whom we are indebted for the data from which this article has been prepared.

The Toronto Railway and Snow Removal.

Following is a summary of the judgment, delivered Mar. 5, in the York County Court, in the case of the City of Toronto against the Toronto Ry. regarding the removal of snow from the streets on which the company operates: It is the duty of the company to keep its track allowance, whether for single or double track, free from snow and ice, so that its cars may be used continuously, and if the fall of snow is less than 6 ins. at any one time, the company must remove it, and, if the City Engineer so directs, spread it evenly on the adjoining portions of the roadway, but should the quantity of snow at any time exceed 6 ins., the whole space occupied as track allowance, viz,—for double track 16½ ft., and for single track 8¼ ft., shall, if the City Engineer so directs, be at once cleaned of snow and ice, and the material removed and deposited at such point, or points, on or off the street, as he may order. The company shall not deposit snow, ice or other material upon any street, square, highway or other public place in the city without first having obtained the permission of the City Engineer, or the person acting as such. From the evidence adduced, a snow fall of 6 ins. occurred on Feb 6, and the company swept it to the sides of the streets, which in due time would become a nuisance and a danger to the public, and that notwithstanding the City Engineer's request to remove it, the company refused to do so. On Feb. 10, 12, 14, 15 and 17, different quantities of snow also fell, which was not removed from the sides of the streets as required, the City being obliged to remove it, and it was therefore declared that it was the duty of the company to have removed the snow as required by the City Engineer.

Explosion in Chatham, Wallaceburg and Lake Erie Railway's Power House.

On Feb. 24, employes of the Chatham Gas Co. proceeded to shut off the gas on the main valve in the building, controlling the gas to the regulating device. In doing so, the valve, of a cast iron plug type, broke off in the centre of the plug, allowing the top portion of the plug to be blown out by the pressure of the gas, which was in the neighborhood of 2 or 3 lbs. per square inch. On account of not having ready access to the valves outside of the building, the gas escaped and filled the boiler room, and ignited, apparently from the boiler furnaces, which are operated by gas, although it was supposed at the time that the men shut off the furnaces. The explosion did not take place until several minutes after the leak occurred, the men remaining in the building apparently trying to stop the leak by some of the methods at hand. During the period which elapsed between the break and the explosion, sufficient gas escaped to fill the room. While the door and ventilators were left shut when the explosion took place, it was sufficient to release the flat slanting roof from the upper wall. The result was that the lowest point in the wall was driven out for the entire length of the building, the roof falling. No damage was done to the plant, with the exception of the breaking of a few of the steam pipes, which were repaired in a few hours. The accompanying illustration shows the boilers exposed, and the debris of the roof and wall lying in the foreground.

Chatham, Wallaceburg and Lake Erie Ry. Power House, After Explosion.

Winnipeg Electric Ry. Suburban Fares.—A new schedule of fares on the Winnipeg Electric Ry. line, between Winnipeg and Headingly, Man., and intermediate points, was announced Feb. 17. Under the arrangement heretofore existing, the line was divided into four zones, while under the new schedule the line as far as Deer Lodge will be counted as being in the city. Beyond Deer Lodge there will be three zones, viz., from Deer Lodge to Kirkfield post office; Kirkfield post office to the rifle ranges; and the rifle ranges to Headingly. The fares are 5c. within each zone; and the return fares from the city are:—Kirkfield, 15c.; rifle range, 20c.; Headingly, 30c. The new schedule came in operation Feb. 18.

The G. T. R. ambulance team at Montreal won the Dominion Bridge Co 's trophy, there, recently.

The Ontario Hydro-Electric Power Commission and Projected Electric Railways.

The proposition for the building of an electric railway from Toronto, via Markham to Port Perry, Whitby and other points east of Toronto, is being discussed by the municipal councils, through whose territory such a line would pass. The heads of a proposed agreement have been discussed by several of the municipalities interested, and some points upon which there may be differences of opinion have been reserved for full discussion at a general meeting of municipalities, which it is expected to hold in Toronto during April.

In Western Ontario, the points upon which interest is centered are St. Thomas, London and Guelph, each of which cities desires to be a centre from which will radiate a network of electric railways, to be built under the Commission plans. Representative meetings have been held at each of the cities named, and many meetings held in the municipalities surrounding these cities have also been held, favoring the plans. The Commission's engineers have been going over the territory which would be served. This covers practically the whole of the Ontario peninsula, west of a line drawn from Port Burwell to Collingwood.

Hon. Adam Beck, Chairman of the Hydro Electric Power Commission, speaking at Aylmer, Mar. 17, is reported to have said the Commission had 1,200 applications for surveys in connection with electric railways, under the Commission's plan. Only half a dozen of these had been dealt with. Four survey parties were in the field going over suggested routes. The Commission was prepared to give estimates for the building of lines in any direction the people desired, and it would be for the people to decide what lines it would be profitable to build. In the case of guaranteeing the bonds of a company, the ratepayers took all the risks, but if they built the lines themselves, they owned them, and would receive the profits.

Hamilton Incline Ry.—It was reported, Mar. 13, that work on the east end incline railway has been progressing satisfactorily. The concrete piers are reported to be ready for the steel. It is expected that the incline will be ready for operation by April 30.

The G. T. Pacific Telegraph Co. has commenced a commercial telegraph service to Prince George, B. C., its station serving Fort George, and South Fort George.

Answers to Questions on Electric Railway Topics.

Following are answers to questions in the American Electric Railway Association's question box, sent in by officials of Canadian electric railways:—

Equipment.—What is the best method of eliminating grounded fields in G. E. 67 and 80 motors? What is the best solder mixture for eliminating loose leads due to excess heating in these motors?

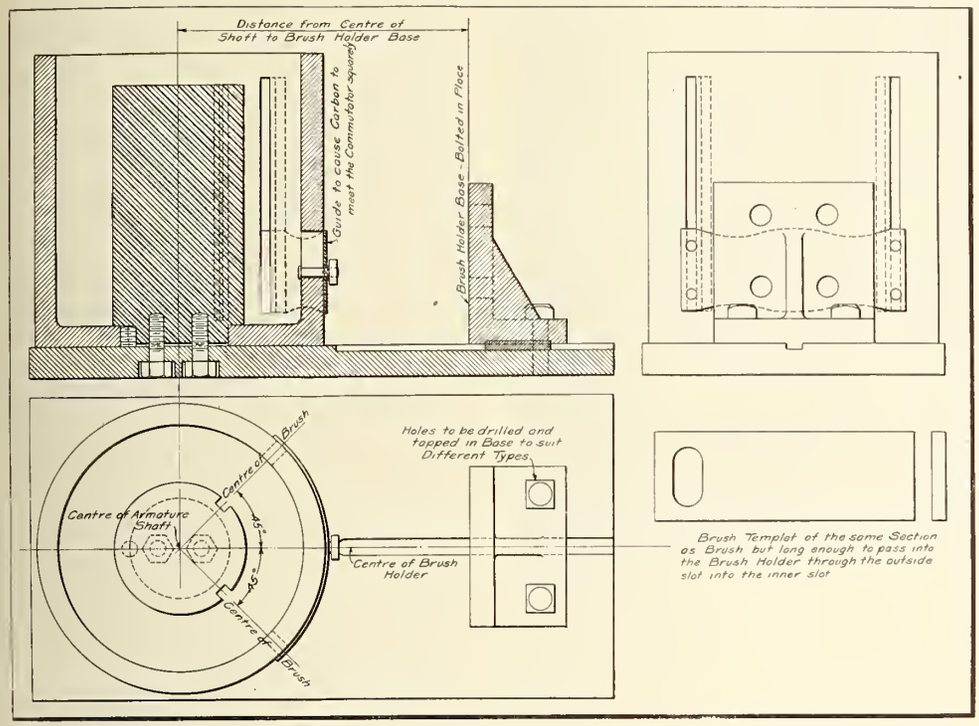
W. R. McRae, Master Mechanic, Toronto Ry.—All field coils in our motor equipment are impregnated, well taped on outside and dipped in air drying, black, waterproof compound. Prior to installing field coil in motor, canvas packers are placed under and over the coil, these packers having been previously treated with boiled linseed oil. The pole piece is then drawn down tightly to place, care being taken to see that it is tight against the frame. This to secure proper armature clearance. The use of the above mentioned liners is for the purpose of securing the coil tightly in the pole piece. We use flexible lead wires on field coils, consisting of 245 strands of no. 30 B. & S. gauge wire, rubber covered and double braided. In my opinion the majority of grounded field coils are caused by loose coils and the use of terminals on the coils. Two 1½ in. holes should be in the bottom of motor frame, and always kept open to permit of water which may get into motor frame, getting out and away from coils quickly.

Armature coils should be properly tinned before being placed in commutator slots. A solder consisting of 55% tin and 45% tea lead will give good results. The reason for using a solder of the above mixture is that it will let go of the coil ends in the event of excessive heating of armature. This for the purpose of protecting the armature coils. Motors should not be operated at such excessive overload as to cause the temperature to rise to a point where solder is thrown out of coil connection, and if this trouble is not caused from overload the seat of the trouble must be in the field coils, which should receive attention at once.

Equipment.—What is the best treatment for brush yokes made in your own shop? What is the best way to secure the proper angle and spacing for new brush yokes for G. E. 67 and 80 motors?

W. R. McRae, Master Mechanic, Toronto Ry.—In the case of wooden yokes, these are made up of well seasoned maple wood, being produced by the use of correct jigs and templates; on completion they are painted with a light coating of shellac to prevent absorption of moisture.

The proper angle and spacing of brush-holders is secured by the use of a special jig, shown in one of the accompanying drawings, E. 247. Whilst it is possible by the use of this jig to secure proper angle and spacing, it would be well to check up the distance between centre of armature shaft and the top of motor frame where yoke is bolted on, as it has been found that this distance varies considerably in these types of motors, so much so that it has been found necessary to use fibre packers of different thicknesses, as shown in the accompanying drawing, F. 212. These packers are placed between the top of centre casting of yoke and the frame, and are used in conjunction with drawing H-73. for the purpose of securing proper commutation of current with a corrected brush-holder.



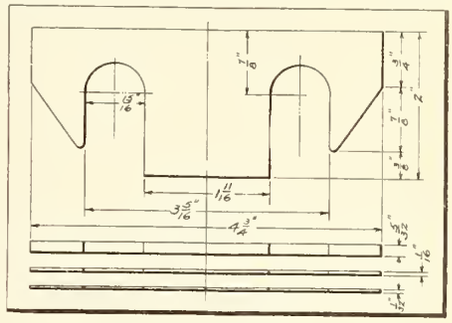
E. 247. Jig used by Toronto Ry. in securing proper angle and spacing of Brush holders.

Buildings and Structures.—What are the advantages of brick, as against concrete walls, in the construction of buildings for railway purposes?

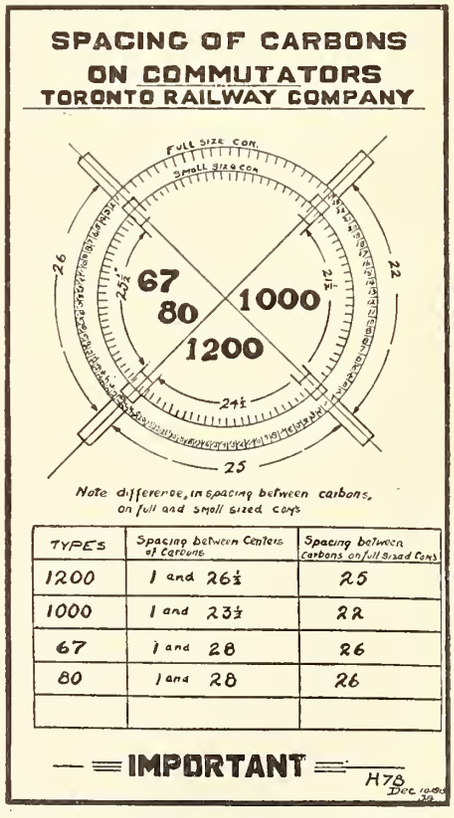
H. G. Salisbury, Architect and Structural Engineer, Toronto Ry.—It can be built on better lines, has a finer appearance and can be constructed at a less cost than good concrete. Alterations can be accomplished more neatly and readily, with less expense to almost any portion of the structure.

Equipment.—The matter of the reclamation of scrap is of importance, and information from companies having experience is of value. What methods do companies follow for the reclamation of iron and steel scrap, other scrap metals, scrap timber and lumber and miscellaneous scrap? Have companies experience with furnace or small rolling mills in the reclamation of scrap? Have any companies special plants for reclaiming either at their scrap docks or main shops? What are the principal articles reclaimed from scrap pile?

W. R. McRae, Master Mechanic, Toronto Ry.—All scrap of standard type of material used on this road, is handled on an exchange basis between the stores department and the maintenance departments. Miscellaneous scrap is delivered to the stores department, from the maintenance departments, credits being given, in each case, to the proper accounts. All scrap material is under the control of the General Storekeeper, and is sold by contract, except such brass and copper as is used in our own foundry, in which case it is charged out from stores against the respective accounts for which it is to be manufactured. A suitable building has been constructed, with bins, under lock and key, for the safeguarding of all scrap material, and a trustworthy man is in charge of building.



F. 212. Packer for G. E. Brush Holder Yoke, Toronto Ry.



The Universal Radiotelegraph Syndicate's wireless telegraph station at Newcastle, N. B., is reported to be near completion. One of the engines has been installed, and recently completed a satisfactory test run of 48 hours. A second will be placed immediately. These are of the Diesel type, each of 200 h. p., using crude oil.

Electric Railway Projects, Construction, Betterments, Etc.

Cape Breton Electric Co.—We are officially advised that the company has no knowledge of any electric railway being projected in Sydney or vicinity from 15 to 25 miles in length (as recently reported in the daily press) nor of any mining company having such a line under consideration. (Mar., pg. 135.)

Dominion Power and Transmission Co.—It is reported that rapid progress is being made with the building of the new steam power plant in Hamilton, Ont., and that a contract has been let to the Canadian Westinghouse Co., for motors, generators, etc., at a cost of $360,000. (Mar., pg. 135.)

Edmonton Radial Ry.—We are officially advised that the details of the estimates for work on the radial railway for the current year before the Edmonton, Alta., City Council, are: Permanent track on Portage Ave. from First St. to Norwood Boulevard, $14,678.10; protection at railway crossings. $12,270; distribution system negative feeders, $37,214; work done during 1913 and unprovided for, $20,216.60; new car barns, unprovided for in 1913, $66,700; fire protection, $3,033; sewer, construction $1,780; tracks laid in barns, $4,165; total, $160,-056.70.

We are further advised that it has been decided to report adversely on the proposed extension to Forest Heights on the ground that the population was insufficient to warrant service of any kind being given, and the committee further recommends that hereafter no extension be made by the department until the district to be served be sufficiently populated to insure adequate returns on the investment. This recommendation refers to the application for an extension into the Mill Creek and other districts. (Mar., pg. 135.)

Galt, Preston and Hespeler St. Ry.—We are officially advised that the company's franchise in Galt, Ont., does not expire until 1921, and that the press reports that a bylaw granting an extension had been approved by the ratepayers, are without foundation. We are also advised that the company has no power house at Galt, and that the press report that such a power house be extended is therefore without foundation. (Mar., pg. 135.)

Guelph Radial Ry.—We are officially advised that although additional stock has been issued by the company, it is not for the purpose of extending the line, but for the purchase of new cars. A. H. Foster, Guelph, Ont., is Manager. (Mar., pg. 135.)

Hull Electric Ry.—A press report states that the company is considering plans for the extension of the line from Hull to Gatineau Point, Que. G. Gordon Gale, Hull, Que., is General Superintendent. We are officially advised that the proposition is entirely on the part of the Hull City Council, and that the company does not contemplate building the extension at present. (Jan., pg. 38.)

Kingston, Portsmouth and Cataraqui Electric Ry.—We are officially advised that the company has ordered in the U. S. 130 tons of 90 lb. steel rails, A. S. C. E. section. H. C. Nickle, Kingston, Ont., is General Superintendent. (Mar., pg. 135.)

Lethbridge Municipal Ry.—We are officially advised that it is proposed to build extensions as follows:—East of 2nd Ave. north from 13th St. to 19th St., north on 19th St. from 2nd Ave. to 7th Ave., west on 7th Ave. from 19th St. to 13th St., north on 13th St. to Harcheville, west on 9th Ave. from 13th St. to the C. P. R. coal mines. It is not expected to make these extensions this year, but it is intended to prepare the plans and estimates in order to have the money in hand for construction in 1915. A. Reid, Lethbridge, Alta., is Commissioner of Public Utilities. (Mar., pg. 135.)

London and Lake Erie Ry. and Navigation Co.—After several conferences between representatives of the company and of the municipal authorities of St. Thomas, Aylmer, Yarmouth and Malahide, it was stated Mar. 5, that the company will build a line from St. Thomas to Aylmer and Sparta, upon the municipalities guaranteeing its bonds for $20,000 a mile. The municipal representatives subsequently met and arranged that the municipalities will guarantee the bonds in the following proportions: —St. Thomas city, $100,000; Aylmer village, $45,000; Yarmouth tp., $145,000; Malahide tp., $20,000. It was also agreed that the ratepayers in the four municipalities will vote on the question Mar. 30. Subsequently the matter was discussed by gatherings of ratepayers, at all of which the question of building lines under the Ontario Hydro Electric Commission was raised. As a result of all this W. N. Warburton, Manager, is reported to have said, Mar. 11, that the directors had decided to withdraw the proposition for the present. G. B. Woods, Toronto, Vice President, is also reported to have said, Mar. 11: We intend to let the matter drop until such time as the people have had an opportunity to obtain an estimate from the Hydro Electric Commission or some other competent engineering authority. If, after the different municipalities have done this and have given the matter careful consideration, and are in a position to make a proposition to us, we will take up the matter with them again." (Mar., pg. 135.)

Montreal and Southern Counties Ry.—The Montreal City Council was informed recently that the Quebec Legislature had refused to sanction an agreement granting the company permission to lay its tracks across McGill St. and on Youville Square, Montreal. (Feb., pg. 87.)

Montreal Tramways Co.—The special committee of the Montreal City Council is studying the company's proposals in connection with the report made by the City Engineer's Department, which was specially submitted to them.

Press reports, Mar. 12, stated that the company's plans for work during the current year provide for the expenditure of about $2,000,000, to include the purchase of 100 new cars, the construction of two new car barns, and the provision of several new routes, in addition to betterment work on existing lines. (Feb., pg. 87.)

Moose Jaw Electric Ry.—It is expected that as a result of the recent municipal census the company will be asked to extend certain of its lines. The agreement with the company provides for the building of lines according to the density of population. The new line suggested is past Wolfe Ave. on 16th Ave., and on to Laurier Ave., about 0.75 of a mile, with a possibility of extending it so as to complete a belt line. This would give a service to the Hillcrest district. (Dec., 1913, pg. 593.)

Ontario West Shore Ry.—It is said that those in charge of this uncompleted line propose to sell the rails which have been laid or are lying ready for laying.

Ottawa and St. Lawrence Electric Ry.—We are officially advised by M. Malone, Engineer of the company at Ottawa, that a contract has been let to the Ottawa and St. Lawrence Construction Co., of which H. W. Pearson is Manager, at 201 Union Bank Building, Ottawa, to build 70 miles of line from the Connaught rifle ranges, 15 miles west of Ottawa, through Ottawa, and thence across country to Morrisburg, Ont., on the St. Lawrence River, with a branch line from Metcalfe to Russell, on the Ottawa and New York Ry.; that this line will cross the C.P.R. Montreal-Toronto line at Winchester; that the line will also pass through thef ollowing towns and villages, viz.: Brittania, South Gloucester, Greely, Kinmore, Vernon, Ormond, Winchester Springs and Williamsburg; that work will commence about May 1, and that bonds have been floated covering this portion of the line. He also stated that on this first portion, outside of terminals, in three of which there will be a 2.5% gradient, the gradients will not exceed 0.7%, with a maximum curvature of 8 degrees; that there will be 12 bridges varying in length from 30 to 400 ft., and that it is proposed to use Diesel electric cars.

The company's complete project is for the building of about 300 miles of line, the other portions including a line from Brockport, west of Brockville, to the Quebec provincial boundary by way of Cornwall, and another line north from Brockport through Smith's Falls, Perth and Lanark to Arnprior. J. A. Morden & Co., brokers, Toronto, are interested in the project.

Port Arthur Electric Ry.—The Mayor of Port Arthur, Ont., announced, Mar. 7, that the proposed extension of the line will reach Murillo, and pass through the townships of Oliver, McIntyre and Ware. No attempt will be made to extend the line into any district tributary to Fort William. The township councils of Oliver and McIntyre have passed resolutions favoring the construction of the extension. Nothing has been done in the way of locating the line, but it is expected that surveys will be made at an early date. The line will be built in sections, and as soon as the necessary legislative authority is obtained, the money bylaws will be submitted to the ratepayers. (See Port Arthur and Fort William Electric Ry., Jan., pg. 39.)

Prince Albert, Sask.—A Prince Albert press dispatch says:—"The Ottawa St. Ry. interests, which already have a line in operation at Moose Jaw, have offered to build a street car line in Prince Albert this year if a 20 year franchise is granted. The council will consider the matter at once." The Ottawa interests referred to are not connected with the Ottawa Electric Ry., but with the Ottawa Electric Co., the General Superintendent of which, A. A. Dion, is President of the Moose Jaw, Sask., Electric Ry.

Quebec Ry., Light and Power Co.—The Quebec City Council is considering a proposal to ask the company to build an extension of its electric railway in Belvedere Ward. (Feb., pg. 89.)

Sandwich, Windsor and Amherstburg Ry.—The three miles of track which it is proposed to build during the summer are, we are officially advised, practically all renewals on existing lines. Jas. Anderson, Manager, Windsor, Ont. (Jan., pg. 39.)

Sarnia St. Ry.—We are officially advised that it is likely the company will, during the summer, extend its line south on Christine St., to Clifford St., thence along Clifford St. west towards the river, about 0.5 of a mile. The extension would be to take care of new business offering from industrial plants. G. E. Wadland, Sarnia, Ont., is Manager. (Mar., pg. 136.)

Toronto Eastern Ry.—Surveys have been completed, according to local press reports, for an extension of the line from Pickering westerly to Scarboro, where connection will be made with the Canadian Northern On-

tario Ry. The distance of this extension is 15 miles. (Feb., pg. 88.)

Transcona, Man.—The Manitoba Legislature has granted power to the Municipal Council of Transcona, to build an electric railway within its limits, and, to make agreements for connecting the line with the Winnipeg Electric Ry.

Windsor, Ont.—A Windsor press dispatch of Mar. 20 says:—"Mayor Clay announced today that he would take immediate steps to bring about the building of a municipal street railway to compete with the private company." The present service in Windsor is supplied by the Sandwich, Windsor and Amherstburg Ry., which also has interurban lines connecting Windsor with Walkerville, Tecumseh, Sandwich, Amherstburg, and Ojibway. It is controlled by the Detroit United Ry., Detroit, Mich.

Winnipeg Electric Ry.—The City Council is asking the company to submit plans showing the extensions proposed to be made on the various lines in the city. (Mar., pg. 136.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and Allied Companies—Gross earnings for January, $777,102; operating earnings, maintenance, etc., $561,146; net income $215,956, against $743,271 gross earnings; $543,803 operating expenses, maintenance, etc.; $199,468 net income for Jan., 1913. Aggregate gross earnings for 7 months ended Jan. 31, $5,330,828; net earnings $1,437,361, against $4,994,095 aggregate gross earnings, and $1,451,321 net earnings for same period 1912-13.

Cape Breton Electric Co.—Gross earnings for January, $29,798.29; operating expenses and taxes, $18,563.18; net earnings, $11,235.11; interest charges, $5,247.37; balance, $5,987.74; bond sinking and improvement funds, $1,190; balance for reserves, depreciation, etc., $4,797.74, against $31,835.43 gross earnings; $17,760.49 operating expenses and taxes; $14,074.94 net earnings; $4,633.19 interest charges; $9,441.75, balance; $1,190 bond sinking and improvement funds; $8,251.75 balance for reserves, depreciation, etc., for Jan., 1913.

The Guelph Radial Ry. Co.'s annual meeting was held at Guelph, Ont., Mar. 9. Following are the officers for the current year—President, J. W. Lyon; Vice President, W. E. Buckingham; Treasurer, C. E. Howitt; Secretary, T. J. Hannigan; other director, S. Carter. A. H. Foster is Manager.

Mount McKay and Kakabeka Falls Ry.—The Fort William, Ont., City Council passed a resolution Mar. 4 to appoint a commission to report on the value of the company's franchise, power rights, railway and other buildings.

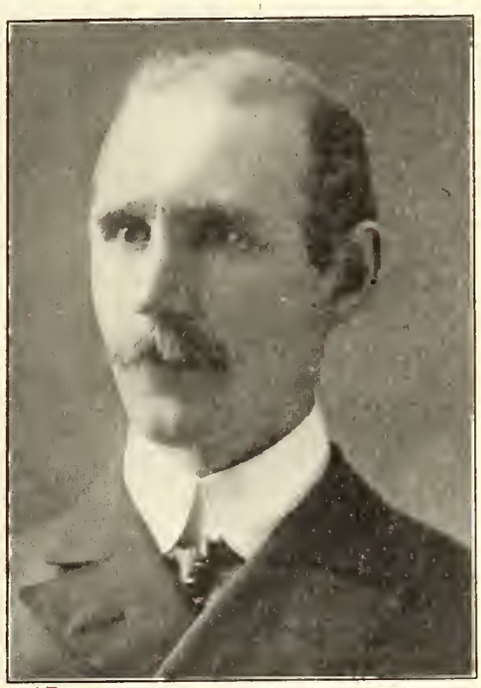
Toronto Civic Car Lines.—A report from the Commissioner of Works to the City Council, Mar. 7, states that the receipts for 1913 were $59,556.87, and the expenditure $145,426.11, making a deficit of $85,569.24, which does not include any allowance for depreciation. The operating charges were $56,658 and the debt charges $87,611. The amount mentioned for depreciation is about $50,000. The question of an increased fare is being discussed but no decision has been arrived at. The present charge is 2c. cash, 1c. for children, and six tickets for 10c.

Toronto Ry., Toronto and York Radial Ry., and Allied Companies.—Gross earnings for January, $847,945; operating expenses, maintenance, etc., $440,337; net earnings $407,608, against $776,928 gross earnings; $401,105 operating expenses, maintenance, etc.; $375,773 net earnings, for Jan., 1913.

The Toronto Ry. earnings for January were $501,843, and for February, $461,274.45. The percentage to the city on the February earnings was $72,057.90.

Toronto Ry. Co.—A London, Eng., cablegram of Mar. 10 said:—"The Morning Post states it understands that arrangements are being made for an issue of £500,000 4½% debenture stock by the Toronto Power Co. The price is stated as 96. This issue, which will be guaranteed unconditionally both as to principal and interest by the Toronto Railway Co., is in addition to debenture stock already issued to the amount of about $13,900,000. The company's total debenture stock authorization is $25,000,000, and issues within this total may be made for several purposes, chief of which is the acquirement of outstanding 5% bonds of the Electrical Development Co. of Ontario."

Winnipeg Electric Ry.—Gross earnings for January, $382,670; operating expenses, $226,177; net earnings, $156,493, against



P383 J. H. Larmonth,
Superintendent, Edmonton Radial Railway.

$351,497 gross earnings; $199,532 operating expenses; $151,965 net earnings, for Jan., 1913.

Motor Busses for Winnipeg.—The Winnipeg City Council has passed a resolution granting a five years' franchise to the Winnipeg Motor Bus Co., to operate motor bus lines in the city. At the end of five years the city may take over the line at the value of the equipment. Each vehicle is to have accommodation for 25 passengers, and is not to run faster than 10 miles an hour.

Winnipeg River Power Co.—We are officially advised that this company, which is allied with the Winnipeg Electric Ry., has entered into a contract with J. G. White and Co., New York, to make explorations and surveys, and to prepare plans for the development of the water power at the Grand Bonnett Falls of the Winnipeg River. No contract has been let for the construction of the power plant.

Edmonton Radial Ry. — The Edmonton, Alta., City Council has authorized the expenditure of $160,056 on the street railway system during this year. Of this sum $90,000 is for work uncompleted in 1913, and for the new car barns, and the balance for track on Portage Ave.; protection at railway crossings, and for the power distribution plant. (Feb., pg. 87.)

Personal Paragraphs.

In connection with the recent resignation of H. Doughty as Superintendent of the Regina Municipal Ry., D. W. HOUSTON has been appointed Acting Superintendent.

J. ANTONISEN, who has resigned his position as Superintendent of the Brandon Municipal Ry., was the recipient, Mar. 6, of a letter signed by all the employes, expressing regret at his leaving.

R. P. LEWIS, who has been appointed street railway traffic inspector by the Winnipeg City Council, at a salary of $2,500 a year, started upon the duties of his office Mar. 12. Mr. Lewis was a C.P.R. locomotive driver for several years, subsequently moving to Winnipeg, where he took up general office work. After spending some time with the Canadian Northern Ry., in several capacities, he left the service in 1913, and worked for R. M. Fenstel on the preparation of his report on the Winnipeg street railway system.

W. T. WOODROOFE, Superintendent, Edmonton Radial Ry., Edmonton, Alta., has resigned, effective, Apr. 1. He was appointed to that position in June, 1912, after having been in the British Columbia Electric Ry. service at Vancouver, for some time. He is reported to have stated recently that the reason for the resignation was that the Mayor had signed an agreement with the street railwaymen's association, with which, he, as Superintendent, was not in accord. He also stated that he had made no plans for the present, but would probably return to Vancouver.

J. H. LARMONTH, who has been appointed Superintendent, Edmonton Radial Ry., which is owned and operated by the City of Edmonton, Alta., was born in Montreal, May 19, 1872. He graduated from McGill University, Montreal, in 1894, since when his record is as follows:—In erecting shops, G. T. R., Montreal, about a year; in G. T. R. draughting office, Montreal, about 4 months; in Laurie Engine Co.'s draughting office, Montreal, about 2 years; in a chartered accountant's office a little over a year, in order to pick up business ideas; in general construction work in Ottawa about a year and a half; with E. B. Eddy Co., Hull, Que., as constructing engineer on paper and pulp mills, etc. about 2 years; then entered office of C. H. Keefer, consulting engineer, Ottawa, and was sent by him to Peterboro, Ont. as resident engineer on construction of Quaker Oats Co.'s dam and power house; then in Quaker Oats Co.'s mills doing construction work and installing machinery for about 2 years; put in charge of Peterboro Radial Ry. construction in 1904 and managed that line along with electric light and gas plants in Peterboro until the summer of 1910, when the Electric Power Co. was formed, which purchased the Peterboro properties, and he was made General Manager of the Electric Power Co., retaining that position for two years, when he resigned to practice as a consulting engineer, specializing on electric railway, electric light and gas work. Latterly he has also been Secretary-Treasurer of the Canadian Electrical Association.

It was recently reported in a local paper that the London St. Ry. contemplated purchasing 6 additional cars of the type recently added to the system, and of which a full description and illustrations have been given in Canadian Railway and Marine World. We are officially advised that no definite steps have been taken to this end. It is possible that the local reference was a mistaken one, the remarks on which the report was founded being concerned with the 6 cars added last year.

Dominion Power and Transmission Company's Annual Report.

Following are extracts from the report for the calendar year 1913, as presented at the annual meeting recently:—

Business has made its regular growth, as formerly, and but for a general trade depression during the last quarter of the year, the increases shown would have been substantially greater. The company's financial position is a good one.

The board has, after careful consideration, instituted a further feature of conservatism in accounting. The subject of maintenance of the physical integrity of the various properties has been carefully investigated, and the policy adopted of providing throughout the past year and hereafter more liberally for this purpose. Previous to 1913 it had been the practice to charge to operating expenses all sums spent on necessary renewals and maintenance, and the amount so spent in 1910 was $210,752.99; in 1911, $224,934.65; in 1912, $282,443.11. It has been found that in those of the states that have public utilities commissions with power and authority over the public utility corporations operating therein, similar to the power exercised by the Board of Railway Commissioners over Canadian railways, such public utilities commissioners have laid down as a practice to be followed by corporations, similar to ours, that a fund must be provided for renewals and maintenance by charging a substantial percentage of their gross earnings each year for that purpose. Your directors have decided to follow the same practice. For the year 1913, the amount so charged was $442,676.66, of which $337,269.37 was actually expended, and the balance of $105,407.29 remains at the credit of this account, which in the statement is shown under the head of maintenance and renewal account as a special reserve. While this may seem a liberal provision for such purpose, it certainly must be considered to be in the best interest of the owners of the company's securities, as it provides amply for renewals and maintenance, and will keep the company's properties in high physical condition without requiring new capital expenditures for this purpose, a bad practice frequently followed by many other enterprises in our line of business. It should also be mentioned that this provision is made in addition to the provisions of the sinking fund for the bonds; so that we believe our finances are on an absolutely sound, and perhaps an ultra conservative basis, but doubtless the shareholders will heartily approve of this action.

There has been transferred also to the general reserve account $450,000, bringing that account down with a total of $1,000,000, and leaving a balance of $955,861.75 in profit and loss account.

A commencement has been made in the construction of an important addition to the company's power producing capacity by means of a steam supplemental station designed for an ultimate output of some 88,000 h.p. This will be a most beneficial adjunct to our hydraulic system, both by way of material increase of power produced on a financially economic basis and protection against possible interruptions of supply.

During the year a further considerable reconstruction, as well as extension, of the street railway tracks has been carried out; and the work of placing underground our distribution lines in the central part of the city is in progress. Attention should, we think, be directed to the great improvement of the street railway plant during the last four years. Notwithstanding the refusal of the Ontario Railway and Municipal Board to order extensive changes, the Hamilton Street Ry. Co. has substantially rebuilt its tracks, provided a new equipment of cars, and is extending its track mileage by 50%. Much fresh capital has been needed to do all this, but the board feels sure that the returns will justify its expenditure.

The extension to Galt of our radial system has for some time been under consideration, and it is hoped that during the present year a branch line will be constructed from the Brantford and Hamilton line to that important town, effecting a comparatively direct and short connection between it and Hamilton.

The outlook for the coming year seems favorable, in spite of the general tendency to look forward to a rather unsatisfactory period of general business.

Earnings and Expenditures.

Gross earnings	$2,737,806.33	
Operating expenses	1,455,992.80	
	$1,281,813.53	
Transferred to maintenance and renewal accounts	141,116.50	
		$1,140,697.03
Bond interest and interest		378,171.92
Surplus earnings		$762,525.11

Profit and Loss Account.

Balance from 1912		$1,005,715.14
Surplus earnings, 1913		762,525.11
Dividends declared	$ 362,378.50	
Transferred to reserve accounts	450,000.00	
Balance	955,861.75	
	$1,768,240.25	$1,768,240.25

Dominion Power and Transmission Co. controls and operates the following properties:—Hamilton Cataract Power, Light and Traction Co., Hamilton Electric Light and Power Co., Hamilton and Dundas St. Ry. Co., Hamilton Radial Electric Ry. Co., Hamilton, Grimsby and Beamsville Electric Ry. Co., Brantford and Hamilton Electric Ry. Co., Hamilton Terminal Co., all with headquarters in Hamilton, Ont.; the Dundas Electric Co., Dundas; the Lincoln Electric Light and Power Co., in St. Catharines; the Welland Electric Co., in Welland, and the Western Counties Electric Co., in Brantford. Separate figures are not given for the different companies operated.

The directors for the current year are:—J. H. Moodie, President; Jas. Dixon, Vice President; Jno. Knox, Treasurer; W. C. Hawkins, Managing Director and Secretary; Sir John Gibson, W. Southam, Lloyd Harris, J. W. Sutherland. The General Manager is E. P. Coleman.

The Grand Valley Railway and Its Subsidiaries.

The necessary formalities for the transfer of the Brantford St. Ry., and the Grand Valley Ry. from Brantford, via Paris, to Galt, Ont., to the Brantford City Council are being gone through. The contract of sale is being finally approved by the various interests, and its sanction by the courts will be asked after the approval of the ratepayers has been obtained. Application is being made to the Ontario Legislature for an act authorizing the city to acquire and operate the lines, and for other necessary powers, so as to cover any complications. The bylaw on which the ratepayers voted Mar. 23, set out that the amount of debt to be created by the purchase is $270,000, and the citizens will assume a mortgage of $125,000. The debt created is repayable in 30 years by means of the provision of a sinking fund of $4,814 annually in addition to the interest amounting to $12,500.

The Woodstock, Thames Valley and Ingersoll Ry., which extends from Woodstock to Ingersoll, Ont., was controlled by the Grand Valley Ry., which is now in liquidation. At a meeting of the bondholders of the W. T. V. and I Ry., held in Toronto recently, it was stated that the G. V. Ry. had no equity in the W. T. V. and I. Ry. until the bonds and arrears of interest had been paid off. The arrears of interest on the bonds to date, was stated to be $20,000. The total issue of bonds outstanding is $140,000, and the owners of $96,800 of the issue were present or represented at the meeting. The bondholders are asking that J. G. Wallace, who has had the management of the line for several years, be appointed trustee. The matter is to come before the courts.

Brantford, Ont., ratepayers voted, Mar. 23, by 1,234 majority in favor of the city buying the Brantford St. Ry. and the Grand Valley Ry. from Brantford to Galt, for $253,000.

Electric Locomotive Performance on Galt, Preston and Hespeler St. Ry.

The G., P. & H.S.R. placed a 50 ton Westinghouse locomotive in service on Nov. 20, 1910, it being described and illustrated in Canadian Railway and Marine World at the time. Since that date it has been in continuous operation, 24 hours every day, except Sundays, averaging about 150 hours a week. This service includes hauling practically every kind of freight in standard steam railway rolling stock, between the C.P.R. at Galt, and Berlin and Waterloo, a distance of from 12 to 14 miles.

Although the haul is not long, there are a number of 2% to 2½% grades from one to two miles long. The maximum number of cars hauled in one train is about 25, the average number being 15, and the tonnage per train is about 200 tons, or on four trips of road per day, 2,000 tons. It is hardly possible to estimate exactly the total mileage, as the greater part of the time, 16 hours a day, the locomotive is in switching service. No record is kept of the tonnage and mileage, but the switching mileage would easily equal half, if not threequarters, of the road service.

The locomotive is equipped with four Westinghouse 308-B-2 commutating-pole, 600-volt railway motors, rated at 120 h.p., and unit switch control. The locomotive is given one half hour inspection every 24 hours, and about five or six every Sunday, when making light repairs, such as applying brake shoes, changing wheels for tire wear and inspection of motors, airbrakes and control equipment. Tires have been turned twice since the locomotive went into service, and the total repair account to July 14, 1913, is given below:—

Air compressor (principally due to armature and field trouble due to low-trolley voltage)	$ 170.00
Tire turning	45.00
Motor axle bearings	30.00
Unit switch control	50.00
Trolley parts, wheels, harps, poles and bases.	110.00
Brake shoes	270.00
Miscellaneous	30.00
Total from Nov. 30, 1910, to July 14, 1913.	$705.00

The total, $705.00, for repairs on this locomotive, covering a period of over 2½ years, is considered a very good record by the operating company, in view of the large amount of service received.

Nova Scotia Tramways and Power Co.—A bill has been introduced in the Nova Scotia Legislature to incorporate a company with this title to take over the Halifax Electric Tramway Co. and the Nova Scotia Light and Power Co. The provisional directors are E. A. Robert, of Montreal, and other directors of the Halifax Electric Tramway Co.

Electric Railway Notes.

The St. John Ry., St. John N.B., has ordered 12 p.a.y.e. cars, with 20 ft. bodies on 21E trucks, turtle back roofs, and interior finish of cherry, from the Tillsonburg Electric Car Co.

The Peterborough Radial Ry. Co. has a bill before the Ontario Legislature authorizing it to issue bonds, etc., up to $35,000 for each mile of single track, instead of $20,000 as previously authorized.

The London, Ont., Board of Control, Mar. 14, recommended the City Council to pass a bylaw for improved street railway service. The schedule submitted by the City Engineer, calls for the operation of 40 cars, instead of 36 as at present, and for the rearrangement of a number of the routes.

The Preston Car and Coach Co. is building two motor busses mounted on Gramm motor trucks, with bodies 15 ft. long by 18 ft. wide, with six standard street car stationary seats, with a seating capacity for 24 passengers, for use by Edmonton, Alta., hotels.

The Saskatoon, Sask., Municipal Ry. was not in operation for a week prior to Feb. 27, owing to a breakdown at the power plant. First one generator gave out and then the second. These give 400 h.p. each. The estimates for the current year provide for the installation of a 600 h.p. generator, in order to provide against such another breakdown.

The six cars which the Niagara, St. Catharines and Toronto Ry. is having built by the Preston Car and Coach Co., of which mention was made in our last issue, will be equipped with four machines each, of the G. E. 204A type, split frame motors, 65 h.p. at 500 volts, 75 h.p. at 600 volts, 2 turn gear pinion, ratio 5423, Sprague electric type M. K. control, all supplied by Canadian General Electric Co.

The Toronto Suburban Ry. has under consideration plans for cars for the line under construction from Lambton to Guelph, Ont., and it is said that about 10 cars, 65ft. long, will be ordered in the near future. They will probably be equipped with four C. G. E. 85 h.p. motors of the latest type, fully ventilated, and the control will be of the multiple unit type to permit of train operation when required. They will be operated on a 600 volt line at approximately half normal speed, and changing from 1,500 to 600 volt trolley, or vice versa, will involve no loss of time in adjustment of control apparatus.

The Guelph Radial Ry. is having two double end, p.a.y.e, steel underframe cars, built by the Preston Car and Coach Co. Following are the chief details,—length overall 45ft. 10 ins.; trucks standard O-50; wheels, 34 ins. rolled steel; motors, Westinghouse 101-B-2; controllers, K-28; air brakes, Westinghouse SM 1; hand brakes, Ackley type; headlights, Crouse Hinds; fenders, Providence type. The cars will be heated with a forced air ventilating system.

The Saskatoon, Sask., and the Lethbridge, Alta., city councils are considering rearrangement of the schedules for running cars on their municipal electric railways, with a view of reducing operating expenses. In Saskatoon it is reported that the present loss on operation is at the rate of $14,000 a year, and in Lethbridge the saving in operating expenses by the new schedule is estimated at $3,000 a year. It is said that the rerouting of cars on Winnipeg Electric Ry. will take effect April 16.

The Quebec Public Utilities Commission gave a decision, Mar. 14, on complaint of a citizen of Longue Pointe Ward against the Montreal Tramways Co., in which the right of a private citizen to lay a complaint and to seek redress was upheld. The application is to direct the company to grant the Longue Pointe citizens the same advantages in fares as those afforded to residents in other parts of the city. The company raised the point that inasmuch as fares and conditions of service were a matter of contract with the municipality, a private citizen could not bring the matter forward. The Commission decided that this matter could be argued when the complaint came up for investigation.

The tentative agreement between the Toronto Ry. Co., and the city, relative to the proposed purchase of the railway by the city, is still in the drafting stages. The clauses relating to the entrance of the radial lines being in the hands of the Works Commissioner and the Engineer of Railways and Bridges, while those relating to the supply of power are being dealt with by the General Manager of the Hydro Electric System. The Mayor recently stated that the power question was one of the vital ones, and it was hoped to have it in such shape that there would be no change in the 3 year contract. When the agreement is completed, it is understood that a vote of the ratepayers will be taken.

St. John Railway Company's Annual Report.

Following are extracts from the reports for the calendar year 1913, presented at the annual meeting in St. John, N.B., recently:—

Your directors wish to congratulate the company on the steady progress that it is making. The statement of the past year's business shows a net profit of $66,328.85, after providing for interest on the bonds and all other charges. Out of this net amount your directors have paid four quarterly dividends of 1½%, amounting to $50,609.48, leaving a balance of $15,719.37, which has been transferred to profit and loss account.

The property has been maintained in a high state of efficiency. A considerable sum has been spent in the upkeep of the tracks, rolling stock, plant and buildings. We have completed an extension of our street railway tracks from the foot of Brussels St. to Kane's Corner, on the Westmorland Road, thence along Douglas St. to the One Mile House, and from there along Rothesay Ave. to Cooper's Corner, 1½ miles.

The new car barn and repair shop on Wentworth St. has been completed, and the street between Queen and St. James Sts. has been paved. The company purchased during the year and put into service eight additional cars. New machinery has been installed in the repair shops, including a hydraulic wheelpress, lathes, pipe cutting machine and hydraulic bender, etc. A new boiler house and stack in connection with the power plant has been erected on Nelson St. New boilers with chain grate stokers are being installed. A 2,000 k.w. steam turbine and generator with condenser and pump, etc., also motor driven exciter and d.c. motor generator set have been added to the power house. The electric light wires and poles have been extended to accommodate the outlying districts. Three thousand feet of gas mains were laid for the purpose of furnishing a sufficient supply of gas for fuel purposes, the charge for which has been reduced to $1 net per 1,000 cu. ft. During the year there were installed 402 gas stoves and appliances. Extensive improvements were made during the past year to Seaside Park, which is now one of the best street railway parks in Canada. Six new p-a-y-e cars have been ordered from the Tillsonburg Electric Car Co., delivery to be made on May 1.

The company has continued its liberal policy towards employes in respect of their wages, having increased them during the year. Your directors have much pleasure in making mention of the faithful and efficient service rendered by our officials and employes. It should be noted by the citizens of St. John that our company paid out in wages during last year $208,186.82. We have in our permanent employ 269 employes. We paid the city last year $30,905.54 for taxes, water rates and repairs.

In order to cover expenditures on capital account during the past few years your directors applied to the Lieutenant Governor in Council and obtained permission to issue 2,000 shares of new stock at par pro rata to the shareholders.

Your directors regret to have to report the death of James Ross, who was the first President of our company, and continued to hold that office until the time of his death, a period of 19 years. We wish to take this opportunity of paying tribute to the able assistance we at all times received from him.

We have just completed an agreement with the councillors of the Parish of Simonds, which has been approved by the Municipality of the City and County of St. John, for the extension of our tracks from Kane's Corner out Red Head Road as far as the corner of the Old Loch Lomond Road, and from the One Mile House on Rothesay Avenue to Coldbrook. We are paying the municipality for this extension $400 per year for each mile of single track and $600 per year per mile of double track. In carrying out our policy of extension your directors were desirous of putting down tracks from Fairville to South Bay Road, and for that purpose entered into negotiations with the Highway Board of the Parish of Lancaster, but were unable to obtain permission from the Board to make this extension.

The directors for the current year are:—H. H. McLean, K.C., M.P., President; F. R. Taylor, Vice President; R. B. Emerson, J. Manchester, W. H. Thorne, J. K. L. Ross. The General Manager is H. M. Hopper.

The Canadian-American Power Corporation has been granted permission by the Public Service Commission of the Second District of the State of New York to do business in the state, but restricting its capital to $1,250,000 on account of the contract and acquisition of the Niagara Falls Transmission Co. The company desires to acquire a contract with the Electrical Development Co. for furnishing 46,000 electrical h.p. procured in Canada and providing for the sale of this power in the U.S., principally along the Niagara frontier. The proposition at one time was connected with a plan to acquire the Buffalo and Lake Erie Traction Co., and the Buffalo and Rochester trolley systems, and merge the whole, but this was defeated.

Toronto & York Radial Ry. Passengers.—In the table published in our March issue, pg. 135, it was set out that the number of fare passengers carried by the Toronto and York Radial Ry. for the year ended June 30, 1913, was 525,571. We have been advised that the insertion of these figures in the blue book was due to an error in tabulating in the department, and that the number of passengers carried on the T. and Y. R. Ry. was 5,255,706.

The Ontario Railway and Municipal Board is to have attached to its staff a telephone and electrical expert, for whom a salary of $3,600 has been provided in the Ontario estimates.

Marine Department

The Dominion Canal Statistics for the Season of 1913.

Following are the principal portions of the report on canal statistics for 1913, as issued by the Department of Railways and Canals:—

The volume of traffic through Canadian canals during 1913 aggregated 52,053,913 tons, compared with 47,587,245 in 1912, an increase of 4%. The total traffic for 1913 was distributed among the various canals as follows:—

	Tons.	Increase.	Decrease
Sault Ste. Marie	42,699,324	3,029,669	
Welland	3,570,714	718,799	
St. Lawrence	4,302,427	825,239	
Chambly	555,602	.....	62,813
St. Peters	71,514	.....	3,295
Murray	180,576	10,495	
Ottawa	365,438	.....	6,912
Rideau	171,223	11,090	.....
Trent	55,800	.....	21,350
St. Andrews	81,295	.....	14,254
Total	52,053,913	4,595,292	128,624

The foregoing figures do not give the net tonnage. They represent the aggregate of the traffic which passed through all the canals, and it happens that a cargo may pass through two or more canals. From the analysis made, it may be said that the traffic of 1913, after eliminating duplication, involved a net tonnage of 44,901,804, of which 6,654,311 tons were of Canadian origin.

On the basis of gross traffic the following table will show the growth since 1904:—

1904	8,256,236	Tons.
1905	9,371,744	"
1906	10,523,185	"
1907	20,543,619	"
1908	17,502,820	"
1909	33,720,748	"
1910	42,990,608	"
1911	38,030,353	"
1912	47,587,245	"
1913	52,053,913	"

The increase of traffic through Canadian canals for the decade was equal to 530%.

The following table shows upon what canals the growth has taken place during the past five years:—

	1909.	1910.	1911.	1912.	1913.
Sault Ste. Marie	27,861,245	36,395,687	30,951,709	39,669,655	42,699,324
Welland	2,025,951	2,326,290	2,537,629	2,851,915	3,570,714
St. Lawrence	2,410,629	2,760,752	3,105,708	3,477,188	4,302,427
Chambly	752,117	669,299	599,829	618,415	555,602
St. Peters	79,850	85,951	75,298	74,809	71,514
Murray	102,291	177,941	163,457	170,081	180,576
Ottawa	336,939	385,261	320,071	392,350	365,438
Rideau	91,774	134,881	172,227	160,133	171,223
Trent	59,952	46,263	57,290	77,150	55,800
St. Andrews	.....	8,283	47,135	95,549	81,295

The ratio which each of the foregoing classes bore to the total volume during the past four years is as follows:—

	1910. %	1911. %	1912. %	1913. %
Agricultural products	10.2	14.2	14.51	16.40
Animal "	1.2	.1	.04	.04
Manufactures	5.2	6.2	4.68	3.61
Produce of forests	3.9	4.0	3.43	3.22
Produce of mines	79.5	75.5	77.34	76.73

An overwhelming proportion of the traffic through the canals consists of products of the mine. This significant situation will be dealt with under the next heading. It arises entirely from the use made of Canadian canals by U.S. vessels.

The public service of Canadian canals must be measured in the light of the nationality of the traffic. The canals are entirely free to Canadian and U.S. vessels. Up to 1909 no record was kept of the origin of cargoes, but since that year it has been possible to separate the business of Canada from that of the U.S.

The facts with respect to tonnage of vessels and cargoes during the past six years are as follows:

Year.	Canadian vessels. No.	Canadian vessels. Tonnage.	U.S. vessels. No.	U.S. vessels. Tonnage.	Freight tonnage. Canadian.	Freight tonnage. United States.	Freight tonnage. Total.
1908	29,040	6,780,789	7,489	4,835,320	5,012,147	12,190,673	17,502,820
1909	22,507	7,811,578	9,996	16,459,322	7,378,057	26,342,691	33,720,748
1910	25,337	8,931,790	11,462	21,777,297	7,883,614	35,106,994	42,990,608
1911	25,585	9,172,192	10,370	18,231,622	7,792,907	30,237,446	38,030,353
1912	27,371	10,237,335	11,785	24,636,190	9,376,529	38,210,716	47,587,245
1913	28,654	12,078,041	10,739	24,238,788	11,130,875	40,923,038	52,053,913

Details of traffic, showing tonnage of commodities, will be found in accompanying tables. Comparing 1912 and 1913, following was the tonnage by classes and canals:—

1912.	Agricultural products. Tons.	Animal products. Tons.	Manufactures. Tons.	Products of forest. Tons.	Products of mines. Tons.	Total. Tons.
Sault Ste. Marie	4,530,792	372	975,303	54,114	34,109,074	39,669,655
Welland	1,205,912	678	625,569	227,684	792,072	2,851,915
St. Lawrence	1,110,567	9,375	464,091	578,760	1,305,395	3,477,188
Chambly	19,706	338	11,600	425,313	161,458	618,415
St. Peters	15,427	2,996	7,583	11,161	37,642	74,809
Murray	448	37	101,511	706	67,379	170,081
Ottawa	5,278	2,880	20,958	226,600	136,634	392,350
Rideau	3,905	3,151	18,814	28,642	105,531	160,133
Trent	2,514	361	3,459	67,489	3,327	77,150
St. Andrews	37	....	60	14,153	81,299	95,549
Total	6,003,676	20,188	2,228,948	1,634,622	36,799,811	47,587,245
1913.						
Sault Ste. Marie	5,253,665	198	733,910	62,958	36,648,593	42,699,324
Welland	1,684,967	361	548,373	337,927	999,086	3,570,714
St. Lawrence	1,545,775	8,269	460,161	660,226	1,627,996	4,302,427
Chambly	13,432	490	20,217	337,331	184,132	555,602
St. Peters	15,935	2,492	8,078	6,301	38,708	71,514
Murray	568	13	75,803	55	104,137	180,576	
Ottawa	4,331	3,657	15,001	186,710	156,839	365,438
Rideau	3,437	3,458	15,213	27,331	121,784	171,223
Trent	1,840	298	2,414	50,812	436	55,800
St. Andrews	377	65	1,629	9,274	69,950	81,295
Total	8,522,327	19,301	1,881,699	1,678,925	39,951,661	52,053,913

Gathering the foregoing facts with respect to freight tonnage into percentage form, the result is as follows:—

	Canadian %	U. S. %
1908	28.7	71.3
1909	21.8	78.2
1910	18.3	81.7
1911	20.5	79.5
1912	19.7	80.3
1913	21.3	78.7

These totals and percentages relate entirely to freight tonnage which passed through Canadian canals. They do not include the traffic which passed through the U.S. canal at Sault Ste. Marie. At that point vessels passing up and down may take either canal. When they pass through the Canadian canal a record is taken of the origin of the cargo; but when they pass through the U.S. canal no such record is taken. Hence it is always impracticable to ascertain with exactness the volume of traffic which belongs to Canada. Until the U.S. takes cognizance of the origin of cargoes this unsatisfactory situation will continue.

A record is kept at the Canadian canal office at Sault Ste. Marie, and it was found that for 1913 but 6% of all freight tonnage which passed through both canals was carried in Canadian vessels.

The overwhelming proportion of U.S. traffic which passes through the Canadian canals arises very largely at Sault Ste. Marie. In 1913 42,699,324 tons of freight were transported through the Canadian canal. Of this 4,951,867, or 11.6%, was of Canadian origin. The remainder, equalling 88.4%, was of U.S origin.

The situation is somewhat improved at the Welland canal. The total freight tonnage which passed up and down at that point in 1913 was 3,570,714 tons, and of this 2,093,406, or 58.7%, belong to Canada. Through the St. Lawrence canals 4,302,427 tons of freight were carried, and of this 2,837,419 tons were of Canadian origin, or 51.6%. There was a marked betterment at the Welland canal in 1913 as compared with 1912, the proportion of distinctly Canadian business having risen from 54 to 59%.

The character of the traffic at Sault Ste. Marie has a great deal to do with the preponderance of U.S. tonnage. Of the 42,699,324 tons of freight which in 1913 passed through the Canadian canal, 32,445,067 tons consisted of ores, chiefly iron. Practically all of this was U.S. business. If ores had been eliminated, the volume of Canadian business through the Canadian canal in 1913 would have been about equal to that of the U.S.

The movement of wheat from the head of Lake Superior eastward has become of increasing importance with the rapid development of the Canadian Northwest. Prior to 1909 the record was not kept in such a way as to separate Canadian from U.S. wheat. Bearing that fact in mind, following is a statement of wheat brought down through the Canadian canal at Sault Ste. Marie:—

1895	4,518,334
1896	19,314,234
1897	17,925,834
1898	9,746,600
1899	12,759,634
1900	9,292,034
1901	6,639,534
1902	27,912,500
1903	32,233,934
1904	29,794,100
1905	25,083,100
1906	34,389,300
1907	49,399,967
1908	58,571,034

1909	*48,047,833
1910	51,774,833
1911	63,641,000
1912	83,743,034
1913	101,066,133

* For the first time represents Canadian wheat only. The figures of preceding years include U.S. wheat which passed through the Canadian canal.

There also was brought down through the U.S. canal at Sault Ste. Marie 40,660,766 bush. of Canadian wheat.

Following is a summary of the facts with respect to Canadian wheat:—

	Bush.
Through Canadian canal	101,066,133
Through U.S. canal	40,660,766
Total	141,726,899

As compared with 1912 this total shows an increase for 1913 of 31,884,868 bush.

There was also brought down 1,684,170 barrels of Canadian flour, which, at 4½ bush. to the barrel, would represent 7,578,765 bush. of wheat. This would bring the final total up to 149,305,664 bush. of Canadian wheat. The aggregate on this basis in 1912 was 123,986,931; so that the net increase, counting wheat and flour together, for 1913 was 25,318,733 bush.

A careful analysis has been made of the course which Canadian wheat took in 1913 in its transportation by water. In order to make the statement complete, copies of all ships' reports filed at the office of the U.S. canal at Sault Ste. Marie were procured, and from these the movement of Canadian wheat through that channel was tabulated.

Taking first the facts in relation to Canadian wheat which passed through the Canadian canal, the distribution in 1913 was as follows:—

	Bush.
Port Arthur-Fort William to Montreal	11,233,133
" " Georgian Bay	21,532,134
" " Other Canadian ports	25,580,000
" " Buffalo	39,282,500
Duluth to Montreal	437,533
" Georgian Bay	416,067
" Other Canadian ports	281,600
" Buffalo	2,303,166
Total	101,066,133

The volume of Canadian wheat which passed through the U.S. canal at Sault Ste. Marie in 1913 was distributed as follows:—

	Bush.
Port Arthur-Fort William to Montreal	717,300
" " Georgian Bay	2,916,000
" " Other Canadian ports	2,465,733
" " Buffalo	28,419,400
Duluth to Montreal	2,798,666
" Georgian Bay	1,189,800
" Other Canadian ports	646,000
" Buffalo	1,507,867
Total	40,660,766

Combining the Canadian wheat which passed through the Canadian canal with the Canadian wheat which passed through the U.S. canal the statement for 1913 is as follows:—

Canadian Wheat.	Bush.	%
Port Arthur-Fort William to Montreal	11,950,433	8.4
Port Arthur-Fort William to Georgian Bay	24,448,134	17.2
Port Arthur-Fort William to other Canadian ports	28,045,733	19.8
Port Arthur-Fort William to Buffalo	67,701,900	47.8
Duluth to Montreal	3,236,199	2.3
" Georgian Bay	1,605,867	1.1
" Other Canadian ports	927,600	.7
" Buffalo	3,811,033	2.7
Total	141,726,899	100.0

The "other Canadian ports" referred to in the foregoing statements are ports between Georgian Bay and Lake Ontario. Cargoes consigned to Kingston are counted as being to Montreal, since Kingston is a port of transfer. The destiny of such cargoes is Montreal. 45.4% of Canadian wheat brought down from the Northwest by water in 1913 clung to wholly Canadian channels.

In order that a comparison may be made with the facts in preceding years, the following table is brought down to the end of 1913:—

Canadian Wheat.	1909. Bush.	1910. Bush.	1911. Bush.	1912. Bush.	1913. Bush.
Fort William to Montreal	10,517,266	13,185,370	12,761,666	14,929,099	11,950,433
" " Georgian Bay	13,384,400	12,753,200	9,881,234	19,501,168	24,448,134
" " other Canadian ports.	10,149,633	9,603,400	11,880,666	20,458,700	28,045,733
" " Buffalo	12,841,334	15,693,363	27,945,600	44,228,266	67,701,900
Duluth to Montreal	520,000	315,000	.....	283,500	3,236,199
" " Buffalo	528,200	224,500	710,334	5,714,367	3,811,033
" " Georgian Bay	28,000	.....	461,500	1,418,767	1,605,867
" " other Canadian ports	79,000	.....	.....	230,000	927,600
" " unclassified	.....	.....	.....	3,078,164	.....
Total	48,047,833	51,774,833	63,641,000	109,842,031	141,726,899
Through U.S. canal	9,117,328	5,321,446	1,981,481	.....	.....
Grand total	57,165,161	57,096,279	65,622,481	109,842,031	141,726,899

The following statement of percentages presents the foregoing tables in a convenient form for purposes of comparison:—

Canadian Wheat.	1909. %	1910. %	1911. %	1912. %	1913. %
Fort William to Montreal	21.9	25.5	20.1	13.6	8.4
" " Georgian Bay	27.9	24.6	15.6	17.8	17.2
" " other Canadian ports	21.1	18.5	18.7	18.6	19.8
" " Buffalo	26.7	30.3	43.8	40.2	47.3
Duluth to Canadian ports	1.3	.6	.7	1.7	4.1
" " American ports	1.1	.5	1.1	5.2	2.7
" " unclassified	....	....	....	2.9	....

The diversion of Canadian wheat to Buffalo-New York, instead of following wholly Canadian channels, is due to several causes. Chief among these is the matter of time. Cargoes are sold for delivery at a foreign port by a specified date, and during the period of pressure in October, November and December, but chiefly in November, the availability of ocean tonnage at New York is a factor rising above freight rates.

Carriers by water are not placed by law on the same reporting basis as are railways. Hence special and extraordinary measures have had to be taken in order to gather facts from which freight rates prevailing on Canadian inland waters might be ascertained. Such steps were taken for the first time in 1912, and were continued in 1913. They have resulted in assembling exceedingly valuable and useful statistical information. That information has been carefully classified and tabulated. With the co-operation of shipowners the system which was inaugurated in 1912 will be continued. It leaves much, however, to be desired. It would, for example, be most instructive also to have definite and authentic reports with respect to the number of vessels operating on inland waters, their tonnage, the capital invested, earnings, operating expenses, tonnage of freight other than that which passes through the canals, employes, salaries and wages bill, accidents, etc. The objects of the special inquiry to which allusion has been made were to show the average rate per ton per mile on inland waters, the average freight charges per ton and per bushel between certain points, and to compare these charges with railway rates. Before steps were taken in this direction in 1912 no information whatever was to be had from any source on these important aspects of transportation.

Having ascertained for 1913 the number of tons carried one mile, and the amount of gross earnings thereon, the following results were reached:—

Canadian traffic:—	
Average rate per ton	99.37c.
Average rate per ton per mile	.184c.
U.S. traffic:—	
Average rate per ton	55.19c.
Average rate per ton per mile	.074c.

As compared with 1912 the foregoing results show a reduction. Following is a comparative summary:—

	1912.	1913.
Average rate per ton	91.04c.	99.37c.
Canadian traffic:—		
Average rate per ton per mile	.194c.	.184c.
U.S. traffic:—		
Average rate per ton	56.62c.	55.19c.
Average rate per ton per mile	.067c.	.074c.

The wide disparity between Canadian and U.S. rates is due wholly to the character of U.S. traffic. Of the 37,747,457 tons of U.S. freight which passed through the Canadian canal in 1913, there were 32,445,067 tons of iron and copper ore and 4,153,301 tons of coal. These two commodities made up 97% of the total U.S. traffic. The ore moved downward and the coal upward. An overwhelming proportion of both the ore and the coal is carried in vessels belonging to the iron and steel industries of Pennsylvania, at rates which can hardly be regarded as commercial. They are uniform year after year—55c. a ton for ore and 33c. for coal. That these rates are not commercial, nor subject to competition, is demonstrated by the fact that in every month of the season of navigation grain and other commodities have been carried over the same route at as high a rate as $1.17 a ton. In some instances the rate was $2 and over a ton.

The Canadian rates also exhibit a wide difference as between maximum and minimum. Wheat was moved during 1913 at as low a rate as .067c. per ton per mile, and at as high a rate as .172. Package freight, aggregating a considerable volume, earned as high as .500 per ton per mile.

The facts having been given with regard to the volume of Canadian wheat moved over the various routes in 1913, it will be instructive to observe the rates of freight which applied to this important traffic. A thorough analysis was made of the reports received, and they yielded the following averages:—

Port Arthur-Fort William to Montreal:—	
Per ton per mile	.142c.
Per bushel	5.351c.
Per ton	$1.78c.
Port Arthur-Fort William to Georgian Bay:—	
Per ton per mile	.148c.
Per bushel	2.279c.
Per ton	76.00c.
Port Arthur-Fort William to other Canadian ports:—	
Per ton per mile	.104c.
Per bushel	2.436c.
Per ton	81.21c.
Port Arthur-Fort William to Buffalo:—	
Per ton per mile	.103c.
Per bushel	2.430c.
Per ton	81.00c.

A comparison of the foregoing rates for 1913 with the rates for 1912 is as follows:—

Port Arthur-Fort William To	1912. Per ton per mile. cent.	1912. Per bushel. cent.	1912. Per ton. $	1913. Per ton per mile. cent.	1913. Per bushel. cent.	1913. Per ton. $
Montreal	.157	5.774	1.924	.142	5.351	1.780
Georgian Bay	.163	2.629	.876	.148	2.279	.760
other Canadian ports	.115	2.384	.795	.104	2.436	.812
Buffalo	.104	2.863	.793	.104	2.436	.812

A record was also kept of the movement of Canadian wheat over the several routes during each month of the season of navigation and the results ascertained were as follows:—

Port Arthur-Fort William to Montreal:—

	Per bush. Cents.	Per ton. $	Per ton per mile. Cents.
April	6.015	2.04	.165
May	5.525	1.84	.135
June	4.682	1.54	.127
July	4.080	1.60	.130
August	5.440	1.68	.137
September	5.282	1.76	.144
October	6.313	2.10	.171
November	6.341	2.11	.172

Port Arthur Fort William to Georgian Bay:

	Per bush. Cents.	Per ton. Cents.	Per ton per mile. Cents.
April	2.42	80.63	.157
May	.16	71.85	.135
June	2.18	73.93	.142
July	1.59	52.73	.092
August	1.43	47.81	.092
September	1.53	51.26	.100
October	2.21	73.95	.146
November	2.46	82.30	.160
December	3.35	$1.12	.220

Port Arthur Fort William to other Canadian ports:—

	Per bush. Cents.	Per ton. Cents.	Per ton per mile. Cents.
April	2.599	86.63	.127
May	2.209	73.35	.091
June	1.755	58.53	.072
July	2.371	90.36	.122
August	1.928	64.27	.082
September	1.969	65.63	.083
October	2.761	92.23	.166
November	2.780	92.69	.116
December	3.081	$1.03	.146

Port Arthur-Fort William to Buffalo:—

	Per bush. Cents.	Per ton. Cents.	Per ton per mile. Cents.
April	2.729	91.20	.108
May	2.442	81.40	.094
June	1.954	65.13	.076
July	2.289	76.30	.118
August	1.969	65.63	.090
September	1.739	57.97	.066
October	2.876	95.86	.122
November	2.998	99.97	.114
December	3.296	$1.09	.126

A study of the returns for 1913 showed that the largest volume of wheat was moved through to Montreal during May and June, when the rates were low and there was no apparent pressure for delivery abroad; while the movement to Buffalo was largest in October and November, when dispatch was the prime consideration, and the rates were high.

The all water rate from Port Arthur—Fort William to Montreal in November averaged 6.341c. a bushel, which must be regarded as a fair rate for the vessels. For the same month the average water rate between Port Arthur—Fort William and Buffalo was 3.296c. To this should be added the rail rate between Buffalo and New York, which in November, for export, was 5½c. a bushel. This fact was officially ascertained from the Buffalo Chamber of Commerce. The combined water and rail rate from Port Arthur—Fort William to Buffalo in November was 8.796c., as compared with an average for that month between Port Arthur—Fort William and Montreal of 6.341c. With an advantage of 2.455c. a bushel in favor of the St. Lawrence route, it is still true that more than ten times as many bushels of Canadian wheat went out by way of Buffalo—New York in November than came down to Montreal. Such a situation is obviously created by other considerations than the rates of freight. They will be found in the availability of ocean tonnage at New York, the demand for expedition, and lower ocean freight and insurance rates from New York than from Montreal.

A larger volume of wheat was brought down to Georgian Bay ports in 1913 than in 1912. The average water rate to such ports was 2.279c. a bushel. The rail rate from Georgian Bay to Montreal was 6c. a bushel; but that rate was probably adjusted so as to make the water and rail rate combined equal to the all water rate. A much larger volume of grain than in preceding years was brought to Port Colborne, passed into the elevator and subsequently carried on to Montreal by water.

Out of the facts which have been presented with respect to freight rates in 1913 on Canadian inland waters, grows quite naturally the suggestion of a comparison with rail rates. It must be said at once that the water rates were considerably lower than the rail rates. It is easily possible with the information in hand which has been gathered during the past years to put certain water rates side by side with rail rates; but such a measurement could not be made with satisfactory accuracy until carriers by water are placed on the same statistical footing as that now occupied by the railways. There are large and important factors lacking from the data which has been made available with regard to the operations of certain carriers by water on the inland waters of Canada. When all the factors are known it will then be practicable to make an exact comparison. The statistical facts dealt with in this report are satisfactory as far as they go; but in a matter of this nature absolutely complete and comprehensive reports are required before conclusions may be drawn which are sound from every point of view. It is believed that the whole statistical situation with regard to carriers by water will be changed during the current year.

Within the limited scope of canal statistics certain facts are definitely known. The rates of freight on a very large proportion of all the cargoes of Canadian origin moved through the canals have been ascertained. From that basic information the average rate per ton per mile has been calculated. The omissions from the account relate to cargoes which did not pass through the canals, and there are good reasons for asserting that such cargoes bore a somewhat higher freight rate than those which applied to the trade of the Great Lakes in particular. The latter is a more or less specialized business, in which competition is active.

It has been shown that the average rate per ton per mile on canal traffic in 1913 was .184c. The corresponding average rate for all the railways of Canada in 1913 was .758c. This comparison is most favorable to carriers by water, but it must not be forgotten that the Government makes a substantial contribution toward freight rates by water. The canals have not only been constructed by the Government, but the Government also maintains and operates them. It is therefore obviously reasonable to ask what the freight rate by water would have been in 1913 if carriers had been obliged to meet the interest on the cost of canals as well as the cost of maintenance. The facts are at hand. The capital cost of Canadian canals to March 30, 1913, was $105,656,037. Interest at 3½% on this sum would amount to $3,697,612. The cost of maintenance for the fiscal year 1913 was $1,603,080. These two sums combined give a total of $5,301,041. The Canadian tonnage in 1913 was 6,654,311; so the Government contribution was equal to 78.85c. a ton. Assuming that all this Canadian tonnage was carried at the same freight rates as the tonnage dealt with in the calculations preceding, it will be seen that 78.85c. was the precise equivalent to .146 per ton per mile. Put into tabular form the account would stand as follows:—

	Per ton. Cents.	Per ton per mile. Cents.
Actual freight rate	99.37	.184
Government contribution	79.66	.147
Total	$1.79.03	.331

The rail rate on wheat from Fort William to Montreal is 12c. a bushel, or $4 a ton. This is equal to .402 per ton per mile; so that the difference in favor of waterborne wheat in 1913 was .071 per ton per mile. Put in another way, if shippers had been obliged to meet the amount involved in the public's contribution to the water rate, the freight cost to Montreal in 1913 would have been 8c. a bushel instead of 5.351c. It should be added that the cost and maintenance of the canals is not the only Government contribution to the water rate. If the cost and maintenance of harbors, lighting, dredging, etc., had been taken into account there would have been a considerable addition. As it was, however, the rate by water was very much lower than the rate by rail.

The insurance rates which prevailed during 1913 on the St. Lawrence and Great Lakes route were as follows:—4¾% from the head of navigation to the eastern end of Lake Erie, an additional 1% to Ogdensburg, and a further 1% to Montreal. This would make the total 6¾% from Port Arthur—Fort William to Montreal, or 2% more than to Buffalo. This difference must be taken into account in comparing freight rates as between Buffalo and Montreal. In December an extension was allowed for the first five days at an additional 1%.

The St. Lawrence River Route.

During a discussion in the House of Commons, Feb. 20, on the Marine Department's estimates for the current year, the Minister of Trade and Commerce stated in regard to insurance rates, that while the Government is in sympathy with any movement to secure lower insurance rates on the St. Lawrence, the representations made to Lloyd's had not accomplished much. The shipping firms of the Dominion have been assured by the Government that if they would do their share in organizing a new plan of insurance the Government will assist, but no practical step has been taken in this direction.

The Minister of Marine stated that the commission consisting of Dean Haskell, V. W. Forneret and W. Stewart, which investigated water levels, etc., during 1913, had found that further investigation would be necessary this season before a report could be presetned. Nothing, however, had been learned that would cause the Government to abandon the plan of deepening the channel to 35 ft., and the work would be carried on during the season. Up to March, 1913, over $15,000,000 had been spent on the St. Lawrence orute, of which $9,000,000 was for dredging. The north channel is now being dredged, and when this is completed, the last impediment to navigation between Montreal and Quebec would be removed. Provision will be made in the supplementary estimates for the building of an additional dredge for this work, but, he stated, it was doubtful if it could be built in Canada. In connection with the ice breaker which is to be built for the St. Lawrence, and which it was decided to have built in Canada, a contract had not been awarded, as no satisfactory tenders were received, the prices being considered too high. The vessel is to be 275 ft. long, about 50 ft. broad and 27 ft. draught, while the horsepower will be between 8,000 and 10,000. It is intended to have it superior to the well known Russian ice breakers, and with this in view conferences have been had with the Russian naval authorities. Winter navigation on the St. Lawrence, he continued, is now beyond the experimental stage, especially with vesels built for such service, and the only question that remains is whether it would be commercially profitable to build such vessels.

Another Steel Car Ferry for the Ontario Car Ferry Company.

An all steel car ferry, Ontario No. 2, a sister ship to Ontario No. 1, being operated between Cobourg, Ont., and Charlotte, N. Y., by the Ontario Car Ferry Co., has been ordered from Polson Iron Works, Ltd., Toronto. The Ontario Car Ferry Co., Ltd., is a combination of G. T. R. and Buffalo, Rochester and Pittsburg Ry. interests, formed some years ago to handle the coal traffic originating on the latter company's lines, destined to points in Eastern Ontario, on G. T. R. lines, the object being to eliminate the long haul around the west end of Lake Ontario. The business handled over by car ferry has increased so greatly that a second vessel is required. It will be in most particulars almost identical with the first ferry on the line, Ontario No. 1, which was described in Canadian Railway and Marine World, May, 1907. Following are some of the principal particulars:

It is to be a twin screw car ferry of the shelter deck type, with four tracks for cars on the main deck. The main deck is to be of steel throughout, without wood covering; the shelter deck is to be of steel laid flush, with a steel deck house running throughout its greatest length and containing accommodation for passengers, officers and crew. It will have a wooden pilot house and bridge on top of the deck house forward, and a pilot house at the after end of the deck house. It will be divided into six transverse watertight bulkheads, extending from the keel to the main deck, with a longitudinal bulkhead along the centre line, in three deep water ballast tanks. There will be three water tanks 13 ft. deep, two of which will be forward of the boiler room, and one aft of the engine room, steel lower deck, to be laid throughout forward and after holds and both peaks, forming the tops of the deep water ballast tanks. There will be two shaft alleys, one on each side from the engine room, extending into the stuffing box bulkhead. The boiler room will contain four single ended Scotch marine boilers placed amidships, with one firehold athwartships and one wing coal bunker on each side of the boiler room. The hull is to be bossed out on each side to enclose the propeller shafts. There will be two steel pole spars, without masts or sails.

The ferry will have a capacity for 28 standard coal cars of 68 tons gross weight each, and 200 tons of fuel in the bunkers. The draught of the vessel will not exceed 16¼ ft. when fully loaded. It is to have a normal working speed of 13 miles an hour, to be maintained in open water, but will be capable of making 15 miles an hour to meet emergency conditions.

Length overall	318 ft.
Length, between perpendiculars	307½ ft.
Beam, moulded	54 ft.
Beam, on main deck	56 ft.
Depth at centre, main deck to promenade deck	17 ft.
Depth at side, main deck to promenade deck	17 ft.
Draught of water with 28 loaded freight cars and 200 tons of bunker coal, not over	16¼ ft.
Camber of main and promenade decks	9 ins.
Depth to promenade deck	20½ ft.
Rise of floor	2 ft.

The ferry is to be built on the transfer system, with solid plate floors and bulb angle frames. The steel plating will not be reduced forward, and will be extra heavy for working in ice. It is to be built to pass the inspection of the Great Lakes Register, and to receive the highest rating in the latter.

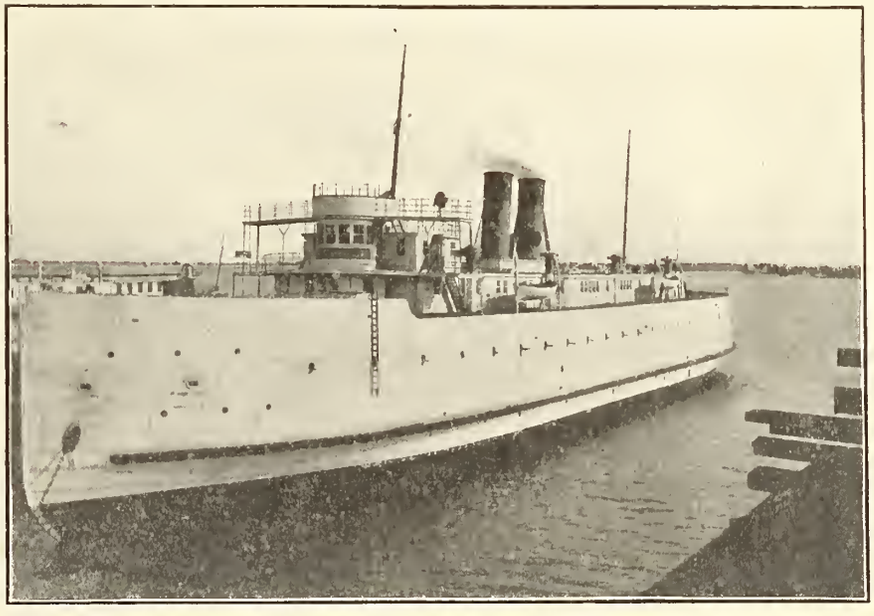
Plates and shapes will be of mild open hearth steel; stem, stern frame and rudder, of hammered scrap iron; and the spectacle frame, of cast steel in two parts. The frames from the after peak bulkhead to the stern post are to be 8 by 3½ in. by 19.17 lb. bulb angles, spaced 24 ins. apart; from the collision to after peak bulkhead, 10 by 3½ in. by 25.9 lb. bulb angles, 24 ins. apart; and forward of the collision bulkhead, they are to be of the same section as in the after peak, but spaced 18 ins. apart on the water line. All frames are to extend to the main deck in one length. The frames above the main deck will be of 8 by 3½ in. by 19.17 lb. bulb angles, spaced 36 ins. throughout.

The bulkhead frames will be 5 by 5 in. by 16.2 lb. angles, double rivetted on both flanges, while the frames in the centre will be 6 by 3½ in. by 11.7 lb. angles. Where floor plates are to be fitted, they will be connected to the shell plating by 4 by 3½ in. by 11.9 lb. angles. The frames below the main deck in the way of the bossing are to be of 4 by 3½ in. by 11.9 lb. angles and 15 lb. plate, with 3 by 3 in. by 7.2 lb. reverse bars. The reverse frames will be of 3 by 3 in. by 7.2 lb. angles, with double reverse frames to be fitted on all floors in the engine space.

The floors in the engine and boiler space are to be 33 in. by 20 lb., and 17½ lb. elsewhere. At the end of the vessel, they are to be 17½ lb., but increased in depth wherever necessary to suit the shape of the vessel.

The bilge keel will be a 13 in. 27.95 lb. bulb angle, fitted between double 6 by 3½ in. by 12 lb. angles, and carried amidships for 110 ft. The main deck stringer will be a 30 lb. plate, 66 ins. wide for two thirds the length, tapering at the ends to 36 in. by 22½ lb., and connected to the shell by 4 by 4 in. by 14.3 lb. angles. The hold stringer will be double 6 by 3½ in. by 15.32 lb. bulb angles with 17½ lb. plate fitted intercostally and connected to the shell by 3½ by 3½ in. by 9.8 lb. angles. The lower deck stringers will be 17½ in. plates, 48 ins. wide for three quarters the length, reduced to 36 in. by 15 lb., connected to the shell and frame with 3½ by 3½ in. angles. The upper hold stringers will be 17½ in. plate, 39 ins. wide for three quarters the length, reducing to 30 ins. by 15 lb., and connected by 3½ by 3½ in. by 9.8 lb. angles. The promenade deck stringers will be 17½ in. plate 72 ins. wide for two thirds the length, reducing to 42 in. 15 lb. and connected by 3½ by 3½ in. by 11.1 lb. gunwale angles. The web plate will be 17½ lb. plate.

The deck plating for the main deck will be 17½ lb. plate; windlass deck, 12½ lb., with 20 lb. under the windlass; lower deck, 12½ lb.; and promenade deck. 10.2 lb. The



Ontario Car Ferry No. 1.

floors are to be connected to the centre keelson by double 3½ by 3½ in by 8½ lb. angles.

The centre keelson will be 45 ins. deep, of 25 lb. plate throughout, with double 5 by 4 in. by 14.5 lb. angles top and bottom. The side keelson will be of several kinds. The first, of double bulb angles, 6 by 3½ in. by 15.32 lb., on top of floor, with 17½ lb. plate filler intercostally between the floors, and connected to the floors and shell by 3½ by 3½ in. by 9.8 lb. angle clips. The second, of single 10 by 3½ in. by 25.9 lb. bulb angles, with 17½ lb. plates fitted intercostally. The third, of double 6 by 3½ in. by 15.32 lb. bulb angles, rivetted back to back, and connected to reverse bars with two ¾ in. rivets. Extra keelsons will be fitted forward, one in each strake of shell plating. There will also be additional keelsons under the engine space.

The keel plates will be 48 ins. wide, of 32½ lb. plate, reduced fore and aft to 30 lb. The hull plating will be in five courses, 25½ lb. plate reduced fore and aft to 21.5 lb.; three courses, 30.6 lb., reducing to 25½ lb., fore and aft; one course 12½ lb. plate, increasing to 15 lb. at the forward end; and two courses, respectively 12½ and 15 lb.

deck beams for the main deck will be 13 by 4 in. by 32 lb. channels; windlass deck, 10 in. by 20 lb.; lower deck, 10 by 3 in. by 22.49 lb. bulb angles; and promenade deck, 8 by 3 in. by 18.4 lb. bulb angles. The six transverse bulkheads will be watertight, with the collision bulkhead 32 ft. abaft the stem.

There will be two 12 by 16 by 18 in. horizontal or vertical duplex piston type ballast pumps, connected so as to individually fill or empty the ballast tanks; one 12 in. centrifugal pump, directed connected to an engine in the engine room, and so arranged as to act as an air pump in emergencies; a fire pump; 6 by 5 by 7 in. duplex bilge pump; 6 by 5 by 7 in. sanitary pump; 4½ by 4 by 5 in. fresh water pump; and a 4½ by 4 by 5 in. cooler pump.

There will be an electric lighting plant, consisting of one 15 k. w. and one 20 k. w. generator. There will be a 16 in. search light. There will also be a 2 ton ice machine, working on the carbonic anhydride principal.

The accommodation on the main deck will be for 6 coal passers, and 6 firemen on the port side, and 2 oilers, 2 watchmen, 4 deck hands and 2 water tenders on the starboard

side, all forward. The promenade deck will have accommodation for the vessel's officers, and in addition, 32 staterooms, as well as passenger saloons, dining room, etc.

There will be two triple expansion, 20½ by 33 by 54 hy 36 in. jet condensing engines, operating normally at about 110 revolutions per minute. They will turn outwards.

The boilers will be four in numher, 14 ft. diameter, and 12 ft. long, of tne Scotch type, fitted for Howden's forced draught, and carrying 180 lbs. Each hoiler will contain three 42 in. corrugated steel furnaces, 42 in. diameter.

Atlantic and Pacific Ocean Marine.

The Canadian Northern Steamships will continue to make Montreal the summer headquarters of the Royal Line during the forthcoming season, and will not run to Quehec only, as it has been reported.

It is reported from the Pacific coast that the Union Steamship Co. of New Zealand, which is now operating the mail steamship service between Canada and Australasia, is about to inaugurate a freight steamship service also, and is at present investigating the requirements of such a service.

The Merchants Trust and Trading Co., of Vancouver, B. C., is reported to be the moving spirit in the formation of a company to inaugurate another steamship service between Canada and Australia. It is said that a monthly or bimonthly service will be given with 13 knot vessels, with accommodation for one class of passengers.

The Royal Mail Steam Packet Co. has arranged to take over the s. s. Mandingo, to replace the s. s. Cohequid, which was wrecked in tne Bay of Fundy recently, and operate her on the West Indies route. The Mandingo was formerly owned by the Elder Dempster Co., and was built for its West African service. The two companies named are closely allied.

H. B. Stoker, formerly in the C. P. R. Steamship Department, has been appointed Westbound Traffic Agent, Manchester Liners, Ltd., with office at Montreal. The company operates a line of steamships between Manchester, Eng., and Montreal, on the summer route, and St. John and Halifax in the winter. Furness, Withy and Co. are the General Agents.

Capt. F. Carey of the C.P.R. s.s. Tyrolean has retired from active service after over 50 years marine experience. He entered C.P.R. service when the C.P.R. acquired the old Beaver Line, and eventually was placed in command of the Empress of Ireland for her first few trips, after which he was transferred, at his own request, to one of the more southerly routes.

The Royal Mail Steam Packet Co.'s s. s. Cobequid which was recently wrecked in the Bay of Fundy, will probably be declared a total loss. She was insured on a value of £30,000, hut the underwriters are only liable for the excess of £10,000 for particular average claims. She was built in 1893 for the Union-Castle Line, and was formerly known as Goth.

Maritime Provinces and Newfoundland.

The Crystal Stream Steamship Co.'s steamhoats D. J. Purdy and Majestic have both had their boilers and machinery overhauled.

The Cape Breton Electric Co.'s new steamboat Electronic will be placed in service on the company's ferry route during the summer.

The Maritime and Newfoundland Steamship Co. is reported to have placed an order at Paisley, Scotland, for the construction of a steel screw driven steamship.

The Majestic Steamship Co.'s s. s. Champlain has heen extensively overhauled during the winter, at Meteghan, N. S., and the hull has been practically rehuilt.

The Dominion Government has awarded a contract for the construction of a hreakwater at Little Sands, P. E. I., to Phillips, Mutch and McLean, Charlottetown.

Furness Withy and Co. are considering tenders for the construction of a pile wharf and steel freight shed, and for moving the existing freight shed and huilding extensions to it, and for other work, at St. John's, Nfld.

It is reported that the St. John River Steamship Co.'s steamhoat Elaine is about to he sold, and that she will he operated during the forthcoming season on the main river route by an independent company.

The steamboat Maggie Miller which runs on the ferry service on the Kennehecasis River, between Millidgeville and Bayswater, N. B., was practically rehuilt during the winter in readiness for the season's service.

The Victoria Steamship Co.'s s. s. Victoria has heen thoroughly overhauled during the winter, and has had her furnaces so arranged that she will use wood as fuel during the forthcoming season, instead of coal.

The Minister of Marine has introduced a bill into the House of Commons, to repeal the acts relating to the North Sydney harbor and to transfer to the Government, the rights, assets and property now vested in the Harbor Commissioners there.

The C. P. R. s. s. St. George, operating on the Bay of Fundy service, is having new turhines installed at New York. The turbines were built at Birkenhead, Eng., and the work is being carried out under the superintendence of the builders

The steamboats Malcolm Cann and Robert G. Cann, owned hy Hugh Cann and Son, Ltd., Yarmouth, N. S., will be operated as follows, during the forthcoming season,—the first, between Guysboro and Mulgrave, daily, and the second, hetween Canso and Mulgrave, daily except Sunday.

The acting Minister of Railways stated in the House of Commons, Mar. 4, in answer to questions, that the amount of the contract for the construction of the Halifax ocean terminal docks, which was awarded to Foley Bros., Welch, Stewart and Fauquier, is $5,208,745, based on schedule prices. The amount deposited by the contractors as security for carrying out the work is $200,000

Representations have heen made to the Dominion Government for the removal of the tax of 1c. a ton on all vessels of over 100 tons capacity, entering the harhor at North Sydney, N. S., as it is claimed that many of the larger vessels which might otherwise utilize the port, avoid it on that account. For entering Sydney harbor, vessel owners pay a nominal fee twice a year.

The New Brunswick courts have recently declined to dismiss the application for a winding up order for the May Queen Steamship Co., Ltd., Gagetown, N. B., but allowed time for any snareholder to offer evidence to determine whether there should be an appeal against it. The winding up order had heen asked for on account of the impairment of the company's capital to the extent of 25%. The company owns the s. s. May Queen, which was built at Carleton, N.B., in 1869, and which is a paddle wheel vessel driven hy an engine of 60 n. h. p. Her dimensions are, length 160 ft., breadth 24.7 ft., depth 8.4 ft.; tonnage 539 gross, 340 register.

Province of Quebec Marine.

J. C. Sullivan, Harbor Master at Quebec for the past 16 years, died there, Mar. 23.

It was reported from the Montreal Harbor Commissioners' office, Mar. 18, that probably the ice would move out of the river by about Apr. 15.

The Dominion Puhlic Works Department has awarded a contract for the construction of a wharf at Thurso, Que., to Belanger Bros., Papineauville, Que.

Polson Iron Works, Toronto, launched the first of the large dump scows, which it is building for the Quehec Harbor Commission, Mar. 4. In order to carry out the launching, the ice in the dock had to be dynamited.

The varying reports as to the future of the shipbuilding plant at Levis, owned by G. D. Davie and Sons, have been set at rest by the announcement of G. D. Davie, that he is incorporating a company with the title of The Davie Company, Limited, to take over the business, he remaining, as heretofore, in control.

Canada Steamship Lines, Ltd., has entered a tender for a mail service, which the Dominion Government intends to inaugurate along the north shore of the lower St. Lawrence, hetween Quebec and Seven Islands. If the matter can he arranged with the company, it may run the Northern Navigation Co.'s s. s. Saronic on the route.

The Department of Marine has issued a list of buoys to be placed, shortly after the reopening of navigation, in the steamship west channel of the St. Lawrence River, known as the Repentigny channel, and which is 300 ft. wide, 15 ft. deep at extreme low water of 1897, between Lavalerie and Ile Deslauriers.

The Dominion Public Works Department during 1913 did considerable dredging in front of Bureau Quay, Three Rivers, giving a 30 ft. waterway at all points up to 30 ft. or less of the quay front, except at a point 400 ft. helow the upper end, where there is a 28 ft. spot 100 ft. outside the quay, surrounded by a patch ahout 100 hy 300 ft. having less than 30 ft. of water. A shelter basin 300 ft. square has been dredged to 14 ft. below lowest low water from the St. Lawrence River into the west mouth of the St. Maurice River.

Ontario and the Great Lakes.

The head office of the Farrar Transportation Co., operating the steamships Collingwood and Meaford on the Great Lakes, has heen moved from Collingwood to Toronto.

Robert Bruce, of Ottawa, has been appointed Superintending Engineer of the Ottawa River Works, for the Department of Public Works, succeeding the late George Brophy.

J. Wiggins, who died at Toronto, Mar. 4, aged 90, was in his early days engaged in Great Lakes navigation, before sailing vessels were displaced hy steamboats, and for 20 years owned the Erie Stewart.

Press reports say that the combined ports of Port Arthur and Fort William, with shipments of 203,328,129 hush. of grain in the navigation season of 1913, lead all ports on this continent in grain shipments.

A deputation from Bruce County waited on the Ministers of Puhlic Works and Marine, Mar. 19, to lay hefore them a scheme for the construction of a port of refuge for lakes, at Inverhuron, on Lake Huron.

The report of G. H. Ferguson, a member of the Ontario Legislature, on a number of allegations in connection with the expendit-

ure of public money on the Trent Canal, was laid on the table of the House of Commons, Mar. 9.

The Department of Railways and Canals has awarded the contract for subaqueous work on section 3 of the Rice Lake Division of the Trent Canal, to Robertson and Co., Cornwall, Ont. The amount of the contract approximates $100,000.

The Ontario Car Ferry Co., which operates between Cobourg, Ont., and Charlotte, N. Y., has applied to the U. S. Interstate Commerce Commission, under the Panama Canal law, for permission to retain, after July 1, its water line holdings in the U. S.

The Whitby Town Council is being asked to consider a scheme for the establishment of a ferry steamboat service between Whitby and Olcott, N. Y. The project would involve the expenditure of about $1,500,000, it is reported, and is in the hands of a U. S. syndicate.

Capt. William McIlwain, who has been connected with marine business for the greater portion of his life, both on the Atlantic Ocean and the Great Lakes, died at St. Catharines, Mar. 2, aged 87. He was, for about 25 years, Examiner of Masters and Mates for the Dominion Government.

The Minister of Public Works, in response to a deputation respecting the proposed harbor improvements at Goderich, promised, Mar. 12, that the matter would be considered at an early date, but could not promise that provision would be made in the supplementary estimates for carrying out the work.

A press dispatch from Port Arthur recently stated that the large freight steamship under construction there for Canada Steamship Lines, Ltd., and of which a full description was given in our last issue, is to be named W. Grant Morden, and that the launching would probably take place Apr. 4.

It was announced in Ottawa recently that the commission to enquire into the commercial possibilities of the project to build a canal between the Georgian Bay and the St. Lawrence River will be appointed shortly. Among those who have been mentioned as members are, W. Sanford Evans, Winnipeg; F. S. Meighen and E. Gohier, Montreal.

Canada Steamship Lines, Ltd., has established a series of lectures in various parts adjacent to the Great Lakes, for the benefit of its navigation employes, with Capt. G. D. Frewer as Instructor. All those engaged in the navigation and handling of the company's vessels necessarily attend the course and pass an examination, which, it is said, makes for a standard considerably higher than that required by the Government examinations.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for February, as follows:—Superior, 602.10; Michigan and Huron, 580.06; Erie, 571.73; Ontario, 245.87. Compared with the average February levels for the past ten years, Superior was 0.38 ft. above; Michigan and Huron, 0.01 ft. below; Erie, 0.08 ft. above, and Ontario, 0.19 ft. above. It was anticipated that during March, Superior would fall 0.1 ft.; that Michigan and Huron, and Erie would rise 0.1 ft., and Ontario 0.2 ft.

A report from Windsor states that a steamboat company is in process of organization to operate a passenger and freight service between Sarnia, Wallaceburg, Windsor and intermediate points, and possibly calling at Detroit, Mich. It is said that the capital will be $50,000, and that a vessel with capacity for about 1,000 passengers will be placed in service by May 1. Among those interested in the project are said to be H. B. Smith, D. A. Gordon, M P., and T. B. Dunbar, of Wallaceburg.

The Algoma Central Steamship Co., a subsidiary of the Lake Superior Corporation and allied with the Algoma Central and Hudson Bay Ry., and the Algoma Eastern Ry., has purchased the s. s. J. A. McKee from the Western Steamship Co., Toronto. This vessel is on the British register, and was built at Newcastle on Tyne, Eng., in 1908. She is screw driven with engine of 204 n. h. p., and her dimensions are as follows:—Length 248 ft., breadth 43.1 ft., depth 22.5 ft., tonnage, 2,158 gross, 1,375 register.

Representatives from Leamington and Pelee Island waited on the Minister of Public Works, Mar. 3, to ask for an appropriation of $75,000 for the construction of a breakwater at Leamington, so as to provide proper protection there with a view to securing safe and constant steamboat communication with Pelee Island. The Minister promised that if an amount was not included in the supplementary estimates during the current session, it would certainly be placed in the estimates for next session.

The Keystone Transportation Co., Montreal, is having built at Londonderry, Ireland, the s. s. Keynor of full canal size, 256 ft. long, 42½ ft. beam, 20 ft. deep, to Lloyds highest class for lake and gulf trading, and especially strengthened for canal work. The engines will have the following dimensions: Cylinders, 16 by 26 by 44 ins.; stroke, 36 in.; boilers, 11½ ft. diameter, 10½ ft. mean length, fitted with forced draught on the Howden system. Capt. James Martin of Kingston will have command, with John Robertson as engineer.

Press reports from Cleveland, Ohio, state that James Playfair, formerly Vice President and Managing Director, Richelieu and Ontario Navigation Co., has purchased the steamships Griffin, La Salle and Wawatam, from the Pittsburgh Steamship Co. These vessels were built at Cleveland, in 1891, 1890 and 1890, respectively, their dimensions being, length 266 ft., breadth 38 ft., depth 23 ft.; tonnage, Griffin, 1879 gross, 1526 register; La Salle, 1935 gross, 1536 register; Wawatam, 1879 gross, 1526 register. They are steel vessels, each equipped with triple expansion engines with cylinders 17, 29 and 47 ins. diar., by 36 ins. stroke. It is also reported that Mr. Playfair is also negotiating for other vessels. Other press reports state that H. W. Richardson, of Kingston, is associated with him in these transactions, and that they have also purchased the steamships Minnekahta and and Minnetonka from the Chicago and Duluth Transportation Co. It is also stated that the foregoing vessels will be operated in the Great Lakes trade, in conjunction with the steamships Glenmavis, Glenfoyle and Calgary, and the motor vessel Toiler. The Glenmavis and Glenfoyle are sister vessels built on the arch principle, which was fully described and illustrated in Canadian Railway and Marine World for Sept., 1913. The Toiler was the first vessel to be equipped with internal combustion engine for the lakes service, and these vessels, with the Calgary, are registered under the name of James Richardson and Sons, Ltd., Kingston.

Manitoba, Saskatchewan and Alberta.

C. A. Dunning, a member of the Saskatchewan Grain Commission, and Manager of the Co-operative Elevator Co., is advocating the construction of an inland waterway system, to enable large vessels to convey grain from the Prairie Provinces to the ocean, thus obviating the numerous transfers of cargo.

The channel at the mouth of the Red River, Lake Winnipeg, known as the new channel, is cut through the northeast extreme of the delta between the middle and east mouths of the river to the lake shore, and extends between pilework breakwaters into deep water of the lake. Range lights have been established to mark the axis of the portion extending into the lake, and the old range lights at the mouth of the Red River have been discontinued, but the lighthouses have been left standing so that in the event of the new channel filling up, the old one could again be used and the old lights put into operation temporarily.

British Columbia and Pacific Coast Marine.

The contract for the extensive harbor improvements at Victoria has been awarded to Grant Smith and Co. and Macdonnell, at prices approximating $2,244,745.

B. W. Greer, Vancouver, has been appointed agent for British Columbia, for the Maple Leaf Line, running vessels between New York and Vancouver, with steel and other cargo.

The two steamships which are under construction at Dumbarton, Scotland, for the C. P. R. British Columbia Coast service, will probably be launched in June or July. It is reported that they will be named Princess Margaret and Princess Melita.

Press reports from Vancouver state that the British Columbia Government has decided to order a ferry steamboat, at a cost of about $25,000, for service across the Fraser River at Ladner, and that tenders will be invited early in April.

We are officially advised that no action is being taken on the tenders recently received for the construction of a 15 in. hydraulic, self propelling steel suction dredge, for use in the Arrow Lakes and adjoining waters, in British Columbia.

The Provincial Government snag boat, recently built at Coquitlam, was towed down the river recently, to New Westminster, where she will have the machinery from the dismantled snag boat installed. The new vessel is named Samson, as was the old one.

Davis and Leslie, consulting engineers, Vancouver, are reported to have been appointed as harbor engineers by the North Fraser Harbor Commissioners, for the laying out of the North Arm of the Fraser River. The firm act as representatives of the English firm of Sir Douglas Fox and Partners.

The dock recently completed at Vancouver for Balfour, Guthrie and Co., consists of two piers, each 450 ft. long and 127 ft. wide. On the piers are warehouses, each 400 by 100 ft., supported on trusses, with no pillars to obstruct the free handling of freight. Railway siding facilities are also provided.

The Public Works Department has dredged a channel 1,700 ft. long by 75 ft. wide and 14 ft. deep, through a sandbar in Cloud Bay on the northwest shore of Lake Superior, to give access to Cloud River which runs into the bay. The north edge of the cut will, on the reopening of navigation, be marked by two red spar buoys, one at each extremity.

It was announced in the House of Commons, Mar. 10, that authority had been given by order in council for the purchase of a site for the proposed Government dry dock at Esquimalt, and that the Public Works Department is negotiating for the acquisition of a frontage of 2,703 ft. at Langs Cove, the estimated cost being $334,595.

The Union Steamship Co. is said to have recently renewed its insurance on nine vessels of its fleet, the values ranging from

$20,000 to $150,000. On the Chelohsin Camosun, Cowichan, Cheakamus and Venture, 189 shillings% is paid; on the Cassiar, 210 shillings, and on the Capilano, Comox and Coquitlam,. 231 shillings. This is an increase of 21 shillings% over the amounts paid in 1913.

In order to permit of repairs to the revolving machinery, the exhibition of the flashing white light at Race Rocks in the Juan de Fuca Strait, on the south coast of Vancouver Island, will be discontinued for about three weeks from May 1. While these repairs are under way, a temporary occulting white light will be shown from a lens lantern, placed on the top of the tower, lighted by acetylene.

A collision between the G. T. Pacific Coast Steamship Co.'s s. s. Prince John and the Dominion Government fisheries protection vessel Newington, off Queen Charlotte Sound, was reported, Mar. 3. The Newington was reported to have been considerably damaged above the waterline. She proceeded under her own steam to Esquimalt where she was docked for examination and repairs.

A deputation of the North Vancouver Council appeared before the municipal committee of the Legislature, recently, to ask that in the new Municipal Act, power be allowed the municipality to operate the ferry service between Vancouver and North Vancouver. The service between these points is now operated by a private company, the capital stock of which is practically all owned by the municipality. The proposal was not entertained, and the deputation was advised that the council should proceed with such a matter by the promotion of a private bill.

The Vancouver Shipmasters' Association recently adopted a resolution calling the attention of the Minister of Marine to the coasting trade so far as it affects the Pacific coast, claiming that at present the coastwise trade on the eastern seaboard has been cornered by aliens, chiefly Norwegians, and that probably on the opening of the Panama Canal, they would endeavor to do the same on the western seaboard. It also asks that no further orders in council, governing the participation in the coasting trade by foreigners, be renewed, or passed, and that a commission be appointed to investigate the whole matter.

The cases against a number of steamship companies, including the C. P. R. and the White Pass and Yukon Route, brought by the U. S. Attorney, alleging discrimination against the Humboldt Steamship Co., in monopolizing wharfage facilities at Skagway, Alaska, and making lower through rates than could be made by other lines, has been compromised by the companies charged pleading guilty, and submitting to fines of various amounts, the White Pass and Yukon Route's amount being $2,000 and the C. P. R.'s $500. In addition to the companies being charged, a number of employes of the companies were charged, but later dismissed from the case.

The Island Transfer and Trading Co., Victoria, the incorporation of which has already been mentioned, is taking over the East Coast Trading and Transport Co., and will run a steamboat service between Victoria and the Gulf Islands, chiefly in the general food supply business. The company has purchased the small steamboat Imperieuse, which was built at Victoria in 1910. She is screw driven by engine of 3 n.h.p., and is of the following dimensions,—length 38 ft., breadth 10.9 ft., depth 4.8 ft.; tonnage, 14 gross, 8 register. The steam tugboat Burin is also being operated by the company, and an option to purchase it has been obtained. The Burin was built at Vancouver in 1910, and is screw driven by engine of 4 n.h.p. Her dimensions are,—length 55 ft., breadth 16.8 ft., depth 7.2 ft.; tonnage, 45 gross, 30 register. Following are the officers and directors,—Managing Director, A. C. C. Smith; Secretary, R. Wilmot; other directors, W. W. Foster, M.L.A.; B. Boggs, W. Blakemore and J. J. White.

The Shipping Federation of Canada's officers for the current year are.—President, A. A. Allan; Treasurer, J. R. Binning; Executive, J. Thom, chairman, A. A. Allan, J. R. Binning, D. W. Campbell, A. W. Mackenzie, W. R. Eakin and R. W. Reford.

Panama Canal Tolls.—In dealing with remarks recently made in the U. S. Senate, respecting the British protest against the exemption provision in favor of U. S. steamship owners using the Panama Canal, Sir Thomas Shaughnessy, President, C. P. R., is reported to have stated that the C. P. R., neither directly nor indirectly protested to the British Government, or any other government, against the Panama Canal tolls, and that the C. P. R. was quite unconcerned as to any decision the U. S. Government came to in the matter.

Victoria, B.C., Breakwater.—The breakwater being constructed by the Dominion Government at Ogden Point, near Victoria, B.C., has reached a stage where operations on parts of the substructure will have to await weather conditions such that divers can assist in the placing of the granite blocks which are to form the foundation for the concrete. In the three weeks in December, during which it was possible to carry on the work, 32,459 tons of rock were dumped, and for the first 900 ft. of its length the substructure has been brought up to a depth of about 20 ft. below low water mark. This work is under the direction of J. S. Maclachlan, District Engineer for the Public Works Department, and the contract is held by the Sir John Jackson Co., Ltd., of London, Eng.

Tides and Currents in the Gulf of St. Lawrence.—The Department of Naval Service has issued a report by Dr. W. Bell Dawson, on the currents in the Gulf, from investigation during 1894-5 and 6, 1906, 1908, 1911 and 1912. During these seasons the work was divided into sections and considerable surveys done in each, the vessel employed being anchored in positions carefully selected for the purpose. The observations of the currents were obtained by current meters registering electrically on board, the speed being measured at the standard depth of 18 ft. in all cases, and a continuous record of the tide was obtained simultaneously for comparison with the currents. The information is divided into two parts, viz., the description of currents on the surface as a mariner may expect to find them in each locality; and the general circulation of the water in the Gulf, and the characteristics of its water in regard to temperature, density, etc.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

66. Feb. 27. Quebec, River St. Lawrence, Lavaltrie to Ile Deslauriers, buoys established to mark Repentigny Channel.

67. Feb. 27. Quebec, River St. Lawrence, Lavaltrie to Repentigny, range lights established to mark Repentigny Channel.

68. Feb. 27. Quebec, River St. Lawrence, Ile a la Bagne, light discontinued.

69. Mar. 2. British Columbia, Vancouver Island, Victoria harbor, Hospital rock, buoy to be moved as work of widening harbor progresses.

70. Mar. 2. British Columbia, Vancouver Island, south coast, Juan de Fuca Strait, Race Rocks, temporary light.

71. Mar. 3. New Brunswick, south coast, Bay of Fundy, Cape Spencer, intended change in character of light.

72. Mar. 3. Nova Scotia, Bay of Fundy, Lurcher Shoal, position of lightship.

73. Mar. 3. Quebec, River St. Lawrence, Barrett ledges, changes in buoyage.

74. Mar. 3. Quebec, River St. Lawrence, Marmen rock, Demers rock, change in position and character of buoys.

75. Mar. 3. Quebec, River St. Lawrence, Montreal harbor, Ile Ronde, front range light to be improved.

76. Mar. 3. England, south coast, Plymouth Sound, light buoys established.

77. Mar. 5. Nova Scotia, Bay of Fundy, Long Island, Petit Passage, Boars Head, fog alarm established.

78. Mar. 5. Quebec, River St. Lawrence below Quebec, Traverse of St. Roch, change in characteristic of gas buoy lights.

79. Mar. 6. Ontario, Bay of Quinte, Picton, dredging.

80. Mar. 6. Ontario, Bay of Quinte, Nigger Narrows, dredging.

81. Mar. 6. Ontario, Lake Huron, Lyal Island, intended change in character of light.

82. Mar. 11. New Brunswick, Bay of Fundy, Machias Seal Island, change in fog alarm, new fog alarm building.

83. Mar. 11. New Brunswick, St. Croix River, St. Stephen, dredging.

84. Mar. 11. Nova Scotia, Bay of Fundy, Brier Island, permanent light.

85. Mar. 11. Nova Scotia, Bay of Fundy, Lurcher Shoal lightship, wireless telegraph, additional information.

86. Mar. 11. Quebec, Gulf of St. Lawrence, Seven Islands Bay, names of lights.

87. Mar. 11. Newfoundland, south coast, Placentia Bay, off eastern entrance to Burin harbor, Iron Island, light discontinued.

Montreal Warehousing Co.—The annual meeting was held at Montreal, Mar. 4. Following are the officers and directors for the current year:—President, E. J. Chamberlin; Vice President, H. G. Kelley; other directors, W. Wainwright, M. M. Reynolds and J. E. Dalrymple; Manager and Secretary, G. H. Hanna.

Lake Grain Shipments in 1913.

The following table shows the bushels of grain shipped from Fort William and Port Arthur during 1913, the amounts in Canadian and U. S. bottoms, respectively, and the quantity sent by each route. The total amount of grain of all kinds shipped from the dual ports in 1913 was 203,328,129 bush., compared with 135,545,946 bush. in 1912.

	Wheat.	Oats.	Barley.	Flax.	Rye.	Mixed.
To Canadian ports in Canadian vessels	61,547,467	25,726,810	6,546,400	8,534,626	3,029	126,158
To Canadian ports in U.S. vessels	2,060,560	.....	67,663	366,227	....	.....
Total to Canadian ports	63,608,027	25,726,810	6,614,063	8,900,853	3,029	126,158
To U.S. ports in U.S. vessels	67,301,363	14,412,154	4,446,578	10,364,492	....	.....
To U.S. ports in Canadian vessels	1,087,939	607,671	78,703	50,289	....	.....
Total to U.S. ports	68,389,302	15,019,825	4,525,281	10,484,781	....	.....
Grand total	131,997,329	40,746,635	11,139,344	19,315,634	3,029	126,158

Coast, Lake and River Officers for 1914.

The following appointments, made by the principal navigation companies, engaged in Canadian navigation, for their various steam vessels and tugs, for this year, have been reported to Canadian Railway and Marine World, by the managements. The first column gives the names of the vessels, the second, those of the captains, and the third those of the chief engineers:—

ALGOMA CENTRAL STEAMSHIP CO., SAULT STE. MARIE. ONT.

Agawa	J. A. Brown	J. L. Smith
J. A. McKee	R. G. Bassett	A. M. MacInnes
J. Frater Taylor	R. H. Boyle	L. B. Cronk
Paliki	H. C. Wingrove	John Knight
Thomas J. Drummond	A. McIntyre	W. T. Rennie
W. C. Franz	W. C. Jordan	G. Sylvester

BAY OF FUNDY AND MINAS BASIN STEAMSHIP CO., LTD., MARGARETVILLE, N.S.

Brunswick	H. W. Moore	G. Snow
Margaretville	S. Baker	L. Harris
Ruby L.	C. D. Baker	A. B. Dorman

BURNHAM MORRILL AND CO., HALIFAX, N.S.

Mary Jane	H. Hingley	John Palmer
Robie M.	R. A. Hines	John McCarvel

CALVIN CO., LIMITED, GARDEN ISLAND, ONT.

Frontenac	C. E. Phelix	F. Campeau
India	C. Beaupre	F. Brian
Johnston	J. W. Phelix	C. Lalonde
Parthia	J. Dix	G. Sauve
Simla	C. E. Coons	D. Simons

CANADA ATLANTIC AND PLANT LINE STEAMSHIP CO., LIMITED, HALIFAX, N.S.

A. W. Perry	H. Doyle	R. Mackay
Evangeline	A. Ellis	James Smith
Halifax	F. H. Hawes	John Dobbie

CANADA ATLANTIC TRANSIT CO., LIMITED, MONTREAL.

Arthur Orr	John Simons	D. E. Mance
George N. Orr	H. Jaenke	J. B. Wellman
Kearsarge	W. Baxter	A. P. Williams
Newona	W. J. Moles	W. Paus

CANADA STEAMSHIP LINES, LTD., TORONTO.

Cayuga	C. J. Smith	A. Mains
Chicora	T. Allen	N. Griffin
Chippewa	W. Malcolm	H. Parker
City of Hamilton	J. L. Baxter	E. Hamelin
City of Ottawa	W. G. Cox	S. Murray
Corona	B. A. Bongard	A. J. Woodward
Geronia	J. Heffernon	J. Kane
Kingston	E. A. Booth	W. Chipman
Macassa	James Henderson	E. A. Prince
Modjeska	P. Walsh	J. A. Findley
Rochester	W. Owens	A. Cummings
Toronto	H. LaRush	D. A. Leslie
Turbinia	B. W. Bongard	W. Noonan

CANADIAN NORTH WEST STEAMSHIP CO., LIMITED, TORONTO.

Atikokan	W. J. Brown	C. Arnberg
George A. Graham	A. A. Hudson	J. H. Louden
Neebing	P. McIntyre	R. R. Foote
Paipoonge	J. N. Foote	H. H. Moore

CANADIAN PACIFIC CAR AND PASSENGER TRANSFER CO., PRESCOTT, ONT.

Charles Lyon	W. Henry	L. Black

CANADIAN PACIFIC RY. BAY OF FUNDY SERVICE, YARMOUTH, N.S.

St. George	M. Cardiff	J. T. Kelly
Yarmouth	A. MacDonald	J. M. Pendrigh.

CANADIAN PACIFIC RY. BRITISH COLUMBIA LAKE AND RIVER SERVICE, NELSON, B.C.

Aberdeen	J. B. Weeks	W. Sutherland
Bonnington	G. Robertson	T. F. McKechnie
Castlegar	M. P. Reid	J. P. Sutherland
Hosmer	F. L. Orr	A. McLeod
Kaleden	F. Broughton	J. McRae
Kokanee	L. McKinnon	J. G. Cameron
Kootenay	G. Robertson	N. Hawthorn
Kuskanook	F. L. Orr	J. Donaldson
Minto	A. Forslund	J. Fyfe
Moyie	W. Wright	D. McLeod
Naramata	M. P. Reid	J. Sutherland
Nasookin	W. Seaman	D. H. Biggam
Nelson	W. Wright	.....
Okanagan	G. L. Estabrooks	W. Jacobs
Proctor	J. Fitzsimmons	P. H. Pearse
Rossland	J. Fitzsimmons	J. Fyfe
Sandon	G. Graham	C. E. McKenzie
Sicamous	G. L. Estabrooks	W. Jacobs
Slocan	W. Kirby	J. Russell
Valhalla	J. Ferguson	T. C. l'Anson
Whatshan	J. Dougal	W. Edwards
Ymir	F. Swanson	W. Kelly
York	A. McDonald	W. Liver

CANADIAN PACIFIC RY. DETROIT RIVER CAR FERRY SERVICE, WINDSOR, ONT.

Michigan	R. Brown	F. Merrill
Ontario	J. Carney	A. McDonald

CANADIAN PACIFIC RY. UPPER LAKES SERVICE, PORT MCNICOLL, ONT.

Alberta	F. J. Davis	C. Butterworth
Assiniboia	Jas. McCannel	A. Cameron
Athabasca	J. B. Currie	W. Lockerbie
Keewatin	M. McPhee	W. Lewis
Manitoba	J. McIntyre	R. Sinclair

HUGH CANN & SONS, LIMITED, YARMOUTH, N.S.

Bruce Cann	I. A. Banks	H. Doane
Hugh D.	E. B. Nickerson	R. M. Gammon
John L. Cann	A. L. MacKinnon	John Nixon
LaTour	F. E. Smith	C. Weddleton
Malcolm Cann	J. R. Durkee	D. E. Read
Robert G. Cann	W. E. Morris	J. L. Cann
Wanda	F. L. Nickerson	H. L. Goodwin.

CANADIAN TOWING AND WRECKING CO., LTD., PORT ARTHUR, ONT.

Barnes	S. Corson	L. Caley
Home Rule	John Scott	W. Floona
J. T. Horne	G. Scagel	H. Cross
James Whalen	A. Morrison	A. Vigars
Minnie W.	R. Nuttall	John Currie
Orcadian	G. Buell	A. Murray
Roi Tan	W. Garrick	C. Kennedy
Salvor	E. J. Cadott	P. Holland
Sarnia	G. Stitt	L. Williams
Superior	A. Fader	W. Farnell
Viper	A. Trembley	John Farquharson

CAPE BRETON ELECTRIC CO., LIMITED, SYDNEY, N.S.

Hygeia	A. McLeod	R. Dickson
Pawnee	J. Brown	A. Campbell
Peerless	I. H. Lewis	J. B. Weeks

CENTRAL CANADA COAL CO., LIMITED, BROCKVILLE, ONT.

Samuel Marshall	C. A. Mahoney	J. R. Ferguson

CHARLOTTETOWN STEAM NAVIGATION CO., LIMITED, CHARLOTTETOWN, P.E.I.

Empress	A. Cameron	J. A. Rowe
Northumberland	A. McLeod	C. Cuming

COAST STEAMSHIP CO., LIMITED, VANCOUVER, B.C.

British Columbia	G. Foellmer	J. Ellison
Celtic	J. Finlay	A. C. Ritchie
Clansman	M. F. MacDonald	H. Nissen
Fingal	R. W. H. Lloyd	H. Spencer

CRYSTAL STREAM STEAMSHIP CO., LIMITED, ST. JOHN, N.B.

D. J. Purdy	F. Maby	—. McVicar
Majestic	B. Dykman	G. Blewitt

DARTMOUTH FERRY COMMISSION, DARTMOUTH, N.S.

Chebucto	John Hare	J. Ross
Dartmouth	W. Jennex	C. Shortt
Halifax	C. A. Ozon	A. McLeod
(Extra Officers)	N. W. Allen	C. Pearce

DOMINION TRANSPORTATION CO., LIMITED, SAULT STE. MARIE, MICH.

Caribou	A. A. Batten	James Nicoll
Manitou	N. McCoy	James McDonald

EASTERN MANITOULIN ROYAL MAIL STEAMSHIP LINE, LITTEL CURRENT, ONT.

Amigo	C. L. D. Sims	— Mikon
Bon Ami	E. Mackie	R. A. Johnston
John Haggart	.....	John Needle

EASTERN TRANSPORTATION CO., LIMITED, BATHURST, N.B.

Nyanza	A. Hains	L. Sprague

FARRAR TRANSPORTATION CO., LIMITED, COLLINGWOOD. ONT.

Collingwood	F. Scott	D. McLeod
Meaford	W. A. Richmond	E. W. Maloney

FOLEY, WELCH & STEWART, VANCOUVER, B.C.

Conveyor	John Shannon	A. Forbes
Operator	C. Myers	D. Martin

FORWARDERS, LIMITED, KINGSTON, ONT.

Port Colborne	W. E. Steeves	John McMillan
W. H. Dwyer	J. P. McLeod	J. Silverthorne

GASPE AND BAY CHALEUR STEAMSHIP LINE, QUEBEC, QUE.

Gaspesian	P. Blouin	J. Bolduc

GASPE STEAMSHIP CO., LTD., QUEBEC, QUE.

Lady of Gaspe	James Boucher	H. Mercier

GRAND MANAN STEAMSHIP CO., LIMITED, GRAND MANAN N.B.

Grand Manan	J. A. Ingersoll	J. C. McGray

GREAT LAKES AND ST. LAWRENCE TRANSPORTATION CO., CHICAGO, ILL.

A. D. Davidson	C. Babb	B. Hammond
A. M. Marshall	T. B. Greenway	O. T. Biddle
George C. Howe	F. Hoffman	J. R. Jones
H. G. Dalton	F. C. Hector	C. Crampton
J. S. Keefe	D. Barry	G. Squier
John Crerar	C. Bennett	W. Vollmer
John Lambert	W. Rinn	J. Gallarno
Robert Wallace	J. A. Connelly	Ole Larsen
S. N. Parent	F. H. Johnson	R. S. Mott

HALIFAX AND CANSO STEAMSHIP CO., LIMITED, HALIFAX, N.S.

Scotia	James Schmeiser	J. G. Clark

F. E. HALL AND CO., MONTREAL.

Byron Whitaker	E. Tremblay	A. Theriault
Carleton	E. Groulx	E. Scott
Clyde	W. H. Ransom	M. J. McFaul
Compton	B. Bowen	L. Smith
Robert R. Rhodes	W. C. McLaren	F. A. Collier
Sindbad	J. C. McCarty	J. A. Miller

HAMELIN AND BRUNELLE, CHAMPLAIN, QUE.

Jessie Bain	E. Brunelle	H. Hamelin

W. HANNA & CO., PORT CARLING, ONT.

Mink	W. H. McCulley	.....
Numinko	J. J. McCulley	S. W. Lambert

HOME STEAMSHIP CO., SYDNEY, N.S.

Eskasoni	E. W. Hickey	C. Dobbie

KEENAN TOWING CO., LIMITED, OWEN SOUND, ONT.

Keenan	J. H. Rutherford	W. Owens

KEYSTONE TRANSPORTATION CO., LIMITED, MONTREAL

Keybell	J. J. Murray	E. W. Sparling
Keynor	Jas. Martin	John Robertson
Keyport	G. Bunting	R. J. Muchmore
Keyvive	John Mullen	James Boak
Keywest	.....	W. H. Jennison

KILKEEL, C., LIMITED, TORONTO

Kilkeel	J. T. Elworthy	.....

LEMCKE TUG CO., LIMITED, LIONSHEAD, ONT.

Henry Pedwell	D. W. Spence	Jas. McGill

MAGDALEN ISLAND STEAMSHIP CO., PICTOU, N.S.

Lady Sybil	F. Ferguson	H. Webster

MAGNETAWAN RIVER AND LAKE STEAMBOAT CO., BURKS FALLS, ONT.

Armour	J. Mostnner	F. Dunn
Gemada	W. W. Kennedy	E. Goldthorpe
Gravenhurst	S. Carswell	M. Pritchard
Thessa	W. Keitch	C. Rooflack
Waiuta	P. Lawson	T. McPherson

MERCHANTS TRANSPORTATION CO., SYDNEY, N.S.

Weymouth	W. E. LeBlanc	Joseph McDonald

MARITIME STEAMSHIP CO., LIMITED, BLACKS HARBOR, N.B.

Connors Bros.	E. H. Warnock	G. Cowie

MATHEWS STEAMSHIP CO., TORONTO

Easton	D. N. Laroche	J. T. Myler
Edmonton	H. Maitland	J. G. Fisher
Masaba	J. A. Smith	W. Whipps
Yorkton	J. Cavannagh	D. McKenzie

NIAGARA, ST. CATHARINES AND TORONTO NAVIGATION CO., LIMITED, ST. CATHARINES, ONT.

Dalhousie City	J. W. Maddick	J. H. Brown
Garden City	G. Blanchard	H. R. Welch

NIPISSING-PONTIAC STEAMBOAT CO., LISKEARD. ONT.

Aileen	J. J. Ladouceur	Chas. Wood

NORTHERN NAVIGATION CO., LIMITED, SARNIA, ONT.

City of Midland	J. D. Montgomery	John Osborne
Germanic	F. G. Males	S. Burgen
Hamonic	A. L. Campbell	Jas. Wilson
Huronic	A. M. Wright	John Smith
Ionic	O. Wing	A. E. Crosthwaite
Noronic	R. D. Foote	S. Brisbin

NORTH SHORE STEAMSHIP CO., SYDNEY, N.S.

Aspy	D. M. MacDonald	J. S. Jackson

NORTH VANCOUVER FERRY CO., NORTH VANCOUVER, B.C.

Ferry No. 1	W. Fatke	L. H. Clark
Ferry No. 2	R. Spicer	D. Becker
Ferry No. 3	W. J. Spracklin	J. W. Whitworth

NOVA SCOTIA STEEL AND COAL CO., LIMITED, NEW GLASGOW, N.S.

Wasis	John Ritcey	A. D. Cameron

ONTARIO CAR FERRY CO., LIMITED, MONTREAL.

Ontario No. 1	F. D. Forrest	J. A. Nicoll

OTTAWA RIVER NAVIGATION CO., MONTREAL.

Duchess of York	E. P. Shepherd	F. Piche
Empress	A. Blondin	A. L. deMartigny

OTTAWA TRANSPORTATION CO., LIMITED, OTTAWA, ONT.

Dolphin	Z. Lavigne	D. Mornaville
Florence	E. Lefebvre	P. Torttier
G. A. Harris	F. Pilon	A. Madore
Glen Allan	A. Clark	G. Beaudet
Hall	J. B. Barclay	W. Drury
Ottawan	A. Malette	H. Lavigne
Sir Hector	W. Mainville	N. Belanger

PORT COLBORNE AND ST. LAWRENCE NAVIGATION CO., LIMITED, TORONTO.

A'gonquin	R. F. Johnson	H. W. Fletcher

PRESCOTT AND OGDENSBURG CAR FERRY CO., LIMITED, PRESCOTT. ONT.

Miss Vandenberg	A. Black	W. J. Jenks
	S. Delamey	

PROGRESSIVE STEAMBOAT CO., LIMITED, VANCOUVER, B.C.

Harry S.	H. Grauer	A. Toren
Progressive	L. Hagen	G. Dixon
Pronative	J. B. Johnson	O. Mathiesen
Senator	J. Walters	C. Mowat

QUEBEC TRANSPORTATION AND FORWARDING CO., LIMITED, QUEBEC, QUE.

Florence	V. Gendron	O. Croteau
J. A. Hackett	J. Thibault	A. Legendre
M. A. Hackett	M. Allison	J. Blanchet

REVELSTOKE NAVIGATION CO., LIMITED, REVELSTOKE, B.C

Revelstoke	A. Forslund	H. Colbeck

RICHMOND STEAMSHIP CO., SYDNEY, N.S.

Richmond	W. H. Micheau	R. Morrison

RIDEAU LAKES NAVIGATION CO., KINGSTON, ONT.

Rideau King	Mm. Scott	D. G. Donovan
Rideau Queen	Ed. Fleming	Thos. Hazlitt

ST LAWRENCE AND CHICAGO STEAM NAVIGATION CO., LIMITED, TORONTO.

E. B. Osler	P. J. Shaw	W. Robertson
G. R. Crowe	C. E. Robinson	W. Reid
Iroquois	J. H. Hudson	J. E. Readman
W. D. Matthews	S. Hill	W. Harwood

SEVERN RIVER AND LAKE COUCHICHING NAVIGATION CO., LIMITED, ORILLIA, ONT.

Soncie	T. W. Wood	T. Marshall

SPARROW LAKE STEAMER LINE, SPARROW LAKE, ONT.

Glympse	A. Stanton	G. Stanton
Lakefield	F. Stanton	A. Lee

UNION STEAMSHIP CO., LIMITED, VANCOUVER, B.C.

Camosun	A. E. Dickeson	J. Brown
Capilano	S. Nelson	A. Johnstone
Casslar	G. Gaisford	C. B. Smith
Cheakamus	J. Cockle	R. Wilson
Chelohsin	J. F. Edwards	H. Stacey
Comox	J. Brown	J. McKiernan
Coquitlam	N. Gray	J. D. McPhee
Cowichan	C. Moody	G. Whalen
Venture	J. Park	J. E. Noel

VALLEY STEAMSHIP CO., LIMITED, ANNAPOLIS ROYAL, N.S.

Granville	C. W. Collins	James McCullough

VICTORIA NAVIGATION CO., LIMITED, OTTAWA, ONT.

Victoria	F. Elliott	P. Belanger

VICTORIA STEAMSHIP CO., LIMITED, BADDECK, N.S.

Blue Hill	D. Macrae	J. H. Jones

WESTERN NAVIGATION CO., LIMITED, FORT WILLIAM, ONT.

Kaministiquia	E. L. Stephens	H. Young

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Titanium Alloy Manufacturing Co., Niagara Falls, N.Y., has issued in sheet form 24 comparative sulphur prints, being a summary of prints shown in bulletins 1 to 5.

Canadian General Electric Co., Toronto, has issued the following bulletins:—A, 4190, Motor generator sets; A. 4185, Single phase motors; A. 4188, small direct current motors. motors.

Flannery Bolt Co., Pittsburgh, Pa., in "Staybolts, a Monthly Digest" for February, deals principally with the Tate flexible radial staybolts, recommending the sleeves LK and KK for button head type of crown stay.

Westinghouse Church Kerr & Co. ,37 Wall St., New York, N.Y., have established a laboratory for testing concrete aggregates, waterproofing materials and for investigating paints and preservative coatings for steel and concrete.

Canadian Westinghouse Co., Ltd., Hamilton, Ont., has the following booklets, etc.:—Westinghouse Portable Meters for Alternating and Direct Current, circular 1104-9-13; Westinghouse Electric Fans, 1914; Westinghouse Ozonizer Sales Helps, the Electric Breakfast Set, Westinghouse Electric Curling Iron.

The Hart-Otis Car Co., Ltd., Montreal, has issued pamphlet 18, "The Yost Draft Gear," which it claims to be a friction gear of five times the capacity of the G Spring gear, at the same cost. The gear is fully illustrated and described under the headings of operation, compression, recoil, construction, strength, adaptability, service and efficiency.

Locomotive Superheater Co., 30 Church St., New York, N.Y., has issued a booklet on the use of highly superheated steam in marine practice, describing and illustrating the Schmidt fire tube superheater as installed in internally fired marine boilers, and giving a list of 881 vessels so equipped, the total horse power of their engines being 1,043,230, and the average h.p. per vessel 1,185.

Gold Car Heating and Lighting Co., 17 Battery Place, New York, N.Y., has issued a booklet, Gold's Electric Thermostatic Control of Steam Heating, which it describes as an economical method of controlling the steam, maintaining an equable temperature in every car throughout the train, lessening the parts and weight of the steam heating system, and cutting down the steam consumption in yards, at terminals, and in service.

Canadian Machinery Corporation, Galt, Ont., has issued a number of sheets 11 by 8½ in. for its loose leaf binder describing and illustrating No. 303, heavy moulder, 504 tenover single or double head, 76 in. portable radial girder drill, 36 in. heavy duty vertical drilling machine, 42 in. heavy car wheel lathe, 60 in. by 60 in. forge planer; extra heavy driving wheel lathe, heavy gate shear with turntable, 50 in. rotary planing machine, horizontal punches, all geared head lathe, and heavy duty double axle lathe.

Northern Engineering Works, Detroit, Mich., has issued its crane catalogue 26, illustrating electric traveling cranes, hand power cranes, electric and pneumatic hoists, also overhead track systems, bucket handling cranes and railway cranes. This catalogue is condensed, but contains references to various bulletins which more fully explain the numerous designs.

The company's Canadian works are the Northern Crane Works, Ltd., Walkerville, Ont., from which point Canadian trade is supplied.

Northern Electric Co., Ltd., which was incorporated recently under the Dominion Companies Act, with office in Montreal, has taken over the business of Imperial Wire & Cable Co., Ltd., and the Northern Electric & Manufacturing Co., Ltd., and will continue to operate without change in management. The officers of the new company are:—E. F. Sise, President; Paul H. Sise, Vice President and General Manager; Clement Saye, Secretary, and G. W. Jones, Treasurer. The Northern Electric & Manufacturing Co.'s present factory will continue to be used as a factory and engineering office for telephone apparatus, and the new works being built on St. Patrick St. will be devoted principally to wire and cable products, it being the intention to sell the Imperial Wire & Cable Co.'s present buildings on St. James and Guy Streets. The general offices will be in the new building on St. Patrick St., and the staffs of the two old companies will be amalgamated there as soon as the building is finished, which will probably be in August.

Mechanical Engineering Co., Ltd., 129 Mill St., Montreal, has issued the following announcement:—"We desire to inform you that Frank Ditchfield, formerly General Superintendent of the Canadian Car & Foundry Co., Ltd., has become associated with us, and will direct the affairs of our consulting engineering department. Mr. Ditchfield was with the Pressed Steel Car Co., Pittsburgh, Pa., for eight years, successively, as Engineer of Construction, Assistant Chief Engineer, and General Superintendent, coming to Montreal in 1907 in the same capacity with the Dominion Car & Foundry Co., and after the formation of the Canadian Car & Foundry Co., was General Superintendent of its plants until 1911, when its business demanded large extensions at its Montreal and Amherst plants, as well as the erection of its new plant at Fort William, all of which work was designed and carried out by Mr. Ditchfield. Francis A. Jacobs will continue in charge of our furnace and general mechanical departments, and his wide practical experience as mechanical engineer in railroad and industrial shops, and as combustion expert pertaining to the use of gas, oil or direct coal fuel, will be at the service of our clients. So that in soliciting your patronage as mechanical and consulting engineers, we feel confident that we can satisfactorily handle such business as you may place in our care."

The Interurban Co. is applying to the Dominion Parliament for an act authorizing it to change its name to the Interurban Telephone Co., and to give it power to build, acquire and operate telephone and telegraph lines, railways and tramways outside the Dominion of Canada. This is the company which reports said might conceal electric railway plans inimical to the interests of the City of Toronto. The company's solicitors have informed the City Council that the company is a subsidiary of the Rio de Janeiro Tramway, Light and Power Co., and has "no connection whatever with any past, present or contemplated undertaking in Canada."

During January one employe was killed and three injured in the course of their employment in electric railway service in Canada.

Transportation Conventions in 1914.

April 21.—American Association of Freight Agents, Houston, Tex.
May —.—Association of Railway Claim Agents, St. Paul, Minn.
May 5-8.—Air Brake Association, Detroit, Mich.
May 13.—Freight Claim Association, Galveston, Texas.
May 18-20.—Railway Storekeepers' Association, Washington, D.C.
May 18-22.—International Railway Fuel Association, Chicago, Ill.
May 19.—American Association of Demurrage Officers, St. Louis, Mo.
May 20-22.—Freight Claim Association, Galveston, Texas.
May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
May 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.
May 26-29.—Master Boiler Makers' Association, Philadelphia, Pa.
May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
June 10-12.—Master Car Builders' Association, Atlantic City, N.J.
June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 16.—Train Despatchers' Association of America, Jacksonville, Fla.
June 16-19.—American Society of Mechanical Engineers, St. Paul and Minneapolis, Minn.
June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.
June 30-July 4.—American Society for Testing Materials, Atlantic City, N.J.
July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.
Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.
Sept. 1-4.—American Boiler Manufacturers' Association, New York.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Reading, Mass.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly (acting), 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King Kingston, Ont.
Eastern Canadian Passenger Association, G. H Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, J. S. Blanchet, Quebec.
Ship Masters' Association of Canada, Capt. E Wells, 45 John St., Halifax, N.S.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

A conference of the secretaries of the 14 branches of the Y.M.C.A., connected with the G.T.R., was held at Montreal, recently. Among the special subjects discussed was the "Safety First" movement, which was introduced by G. Bradshaw, Safety Engineer, G.T.R.

Iceland is, it is said, to have its first railway, some 60 miles, built.

Department of Railways and Canals, Canada.

Welland Ship Canal.

SECTION NO. 4A.

NOTICE TO CONTRACTORS.

SEALED TENDERS, addressed to the undersigned and marked "Tender for Section No. 4A, Welland Ship Canal," will be received at this office until 12 o'clock noon on Thursday, April 9th, 1914.

Plans, specifications and form of contract to be entered into can be seen on or after this date at the office of the Chief Engineer of the Department of Railways and Canals, Ottawa, and at the office of the Engineer in Charge, St. Catharines, Ontario.

Copies of plans and specifications may be obtained from the Department on the payment of the sum of fifty dollars. To bona fide tenderers this amount will be refunded upon the return of the above in good condition.

Parties tendering will be required to accept the fair wages schedule prepared or to be prepared by the Department of Labor, which schedule will form part of the contract.

Contractors are requested to bear in mind that tenders will not be considered unless made strictly in accordance with the printed forms, and in the case of firms, unless there are attached the actual signature, the nature of the occupation, and place of residence of each member of the firm.

An accepted bank cheque on a chartered bank of Canada, for the sum of $5,000.00 made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sum will be forfeited if the party tendering declines entering into contract for the work, at the rates stated in the offer submitted.

The cheques thus sent in will be returned to the respective contractors whose tenders are not accepted.

The cheque of the successful tenderers will be held as security, or part security, for the due fulfilment of the contract to be entered into.

The lowest or any tender not necessarily accepted.

By order,

L. K. JONES,
Asst. Deputy Minister and Secretary.

Department of Railways and Canals,
Ottawa, 21st March, 1914.

Newspapers inserting this advertisement without authority from this Department will not be paid for it.—58047.

HEADLIGHTS - We Make Them

for OIL for Pyle ELECTRIC equipment or SPECIAL to Blue Print, and carry a large stock of standard headlight reflectors, burners, burner parts, felt wicks and chimneys.

The HIRAM L. PIPER CO., Limited

75-77-79 and 81 St. Remi Street, Montreal

Railway Catalogue No. 30, Marine Catalogue No. 21. Mailed on Request.

CANADIAN NORTHERN ONTARIO RAILWAY COMPANY.

NOTICE is hereby given that application will be made to the Parliament of Canada, at its present session, for an Act authorizing the sale of a portion of the constructed right of way of the Carillon & Grenville Railway Company between Grenville and Carillon by the Carillon & Grenville Railway Company to the Canadian Northern Ontario Railway Company, and confirming a notarial deed of sale thereof, dated 25th July, 1911, passed before notary Robert Bennett Hutcheson, under his number 11283, and registered in the Registry Office at Lachute, P.Q.

GERARD RUEL,
Chief Solicitor.

Toronto, 26th February, 1914.

OUR SPECIALTIES

American Gravity Tank Hose Coupling,
Campbell Graphite Lubricator,
Acme Angle Cock Holder,
Acme Pipe Clamp,
Security Backup Valve,
Security Bell Ringer.

Adreon Manufacturing Co.
Security Building, St. Louis, Mo.
Canadian Representative: O. W. Meissner, 195 Commissioner Street, Montreal, Que

Station Signs that Command Attenion

AGENT

Enameled iron signs for station names and doors are ideal.

They always command attention and look bright and attractive. They never fade and will last a life time.

They Save Money.
Write for Prices.

Acton Burrows
Limited
70 Bond Street, Toronto

Car Closets
FLUSH OR DRY
DUNER CO. 101 S. CLINTON ST. CHICAGO

COMMERCIAL FURNITURE FOR TICKET CASES AND
of all descriptions to stock or special design, apply to
The Canadian Office and School Furniture Co., Limited
Preston Ontario

SHOT
BLOCKS
INGOTS

METALLIC NICKEL
Prime Metal for the manufacture of Nickel Steel, German Silver, Anodes and all Alloy purposes.
The International Nickel Co.
43 Exchange Place - New York

Also
Electrolytic
Nickel
(99.80% Pure.)

The Pratt and Letchwood Co., Limited
Brantford, Ont.
MISCELLANEOUS MALLEABLE CASTINGS AND RAILWAY SPECIALTIES
NON-CORROSIVE MALLEABLE TIE PLATES AND RAIL BRACES

Royal Military College of Canada.

Entrance Examination, 1914.

IT is notified for the information of all concerned that Squad and Company Drill (practical) is added to the list of voluntary subjects for the Entrance Examination to the Royal Military College, 1914. Marks will be awarded as follows:—

	Maximum.	Minimum.
Squad Drill	100	50
Company Drill	100	50

The authorized text Book for this subject is "Infantry Training, 1911," Part II and Sections 1 and 2 of Part III. This book can be obtained from Officers Commanding Divisions and Districts, price 25 cents.

V. A. S. WILLIAMS, Colonel,
Adjutant General.

Department of Militia and Defence,
Ottawa, March 9, 1914.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.

(H.Q. 74-63-1. 57401.)

TENDERS.

SEALED TENDERS addressed to the Secretary of the Department of the Interior, Ottawa, Ont., and marked "Tenders for steel water pipe, Banff," and "Tenders for cast iron water pipe, Banff," will be received up to noon 6th April, 1914, for the supply of (a) thirteen thousand five hundred (13,500) lineal feet of twenty inch diameter lapwelded steel pipe, and (b) twelve thousand (12,000) lineal feet of six inch diameter cast iron pipe for the water system at Banff, Alta.

Specifications may be had from the Commissioner of Dominion Parks, Ottawa, Ont., the Chief Superintendent of Dominion Parks, Edmonton, Alta., the Superintendent, Rocky Mountain Park, Banff, Alta.

The lowest or any tender not necessarily accepted.

The unauthorized insertion of this advertisement in any newspaper will not be paid for.

LYNDWODE PEREIRA,
Secretary.

Department of Interior,
Ottawa, Ont.

Meteor Metal

An absolute substitute for

Platinum

for

Spark and Contact Points

in Gas and Gasoline Engines and Automobiles

Telephones, Bells and Electrical Devices

Is Non-corrosive, Non-expanding, Non-oxidizing

Supplied in

Rods, Sheets, Tapes

Write for Particulars.

Hermann Boker & Co.
332 St. James St., Montreal

The Preston Car & Coach Co., Limited

PRESTON, ONT.

MANUFACTURERS OF

Steam and Electric Railway Cars and Special Cars.

Ventilation-Sanitation-Economy-Safety
All Combined in
THE COOPER FORCED VENTILATION HOT AIR HEATER
(PATENTED)
Ask for the full story.
We Also Manufacture Pressed Steel Hot Water Heaters
THE COOPER HEATER CO., CARLISLE, PA.

CRANES AND HOISTS

NORTHERN CRANE WORKS, Limited
Walkerville, Ontario

James T. Gardner
RAILWAY EQUIPMENT
615 Railway Exchange
CHICAGO, ILL.

Has on hand at all times

First-Class Freight and Passenger Locomotives

Also

Contractors' Locomotives Cars, Rails, Etc.

Specifications with Prices on Application

Quality Not Quantity

Is the reason why we make our Replacers out of the BEST STEEL PLATE instead of cast metal. The distance from caboose to head end of train is getting longer, and when a man carries a pair of our Replacers that distance he is not all used up, but ready to rerail his car or locomotive.

The pair this man is carrying is our Standard No. 1, made of 9-16 plate, weight 164 lbs. per pair, and guaranteed to carry 200 tons.

We make smaller sizes, No. 3 for Mine Work, Electric Motors, Mine Engines and Rope Haulage; weight 58 lbs. per pair.

Do not fool yourself. If you want efficiency and quick service give your men a tool they can handle, that will do the work and that pleases them.

SEND FOR CIRCULAR SHOWING USERS. 70,000 PAIR IN SERVICE.

The Alexander Car Replacer Manufacturing Co.
SCRANTON, PA.

The Ottawa Car Manufacturing Co., Limited

Builders of

Electric Cars, Fine Carriages, Wagons, Sleighs, Etc.

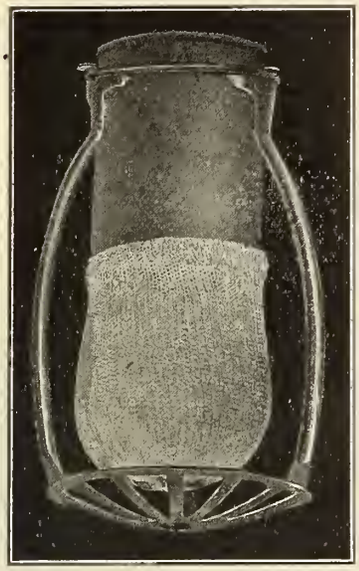
Office and Works:
SLATER ST. - OTTAWA

Iron
Steel
or
Bronze
Any Size
or
Purpose

PROPELLER WHEELS

THE WM. KENNEDY & SONS, Limited
OWEN SOUND, ONT.

Solid
or
Sectional
=
Large
Stock.



Pintsch Mantle Light

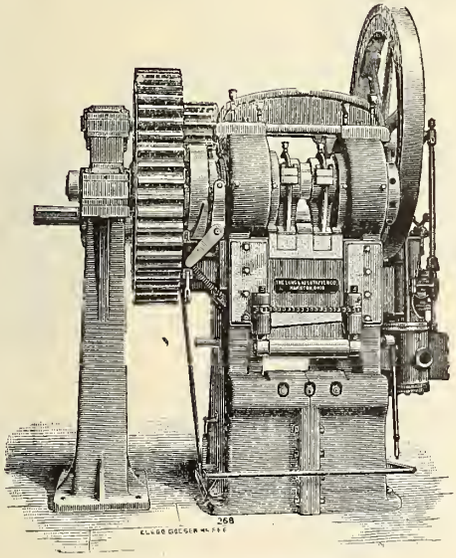
No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

2 RECTOR STREET, NEW YORK

718 TRANSPORTATION BUILDING, MONTREAL

POWER PUNCHING AND SHEARING MACHINERY



Gate Shear—Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

THE LONG & ALLSTATTER CO.

Hamilton, Ohio, U. S. A.

Riveting Machines **Tire Welding Machines**

Armature Disc Notching Machines

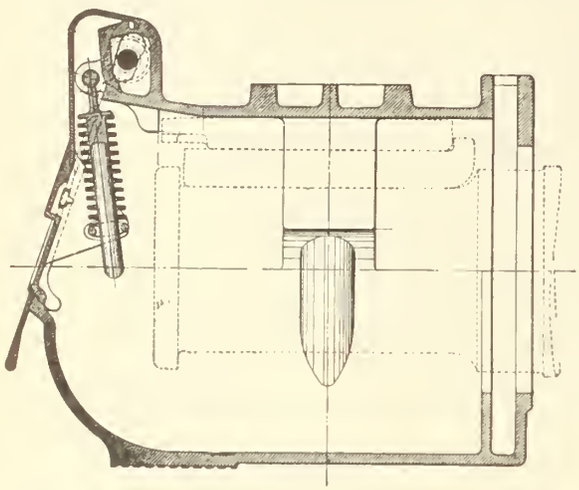
Tire Bending Rolls **Beam Coping Machines**

Bending and Forming Machines

Write for Catalogue if interested. Correspondence invited.

The McCord Malleable Iron Journal Box

MANUFACTURED IN CANADA



The Strongest, Lightest, Tightest Box Made

The McCORD Draft Gear
The McCORD Spring Dampener

The McKIM Gasket
The McCORD Force Feed Lubricator

McCORD & COMPANY
People's Gas Building, Chicago

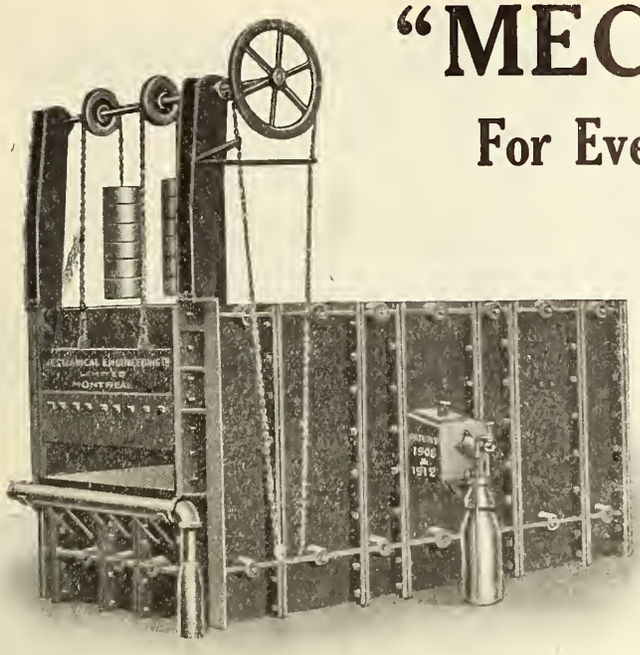
THE HOLDEN CO., Limited
354 St. James Street, Montreal

NOVA SCOTIA CAR WORKS LIMITED

MANUFACTURERS OF
STEEL AND WOOD
FREIGHT CARS

ALSO MAKERS OF
CHILLED IRON
CAR WHEELS

HALIFAX, N.S.



"MECOL" Furnaces

For Every Metallurgic Operation

Designed for Natural or Producer Gas, Oil, Coal or Coke as fuel.

Canadian Agents for R. D. Wood & Company's Gas Producers.

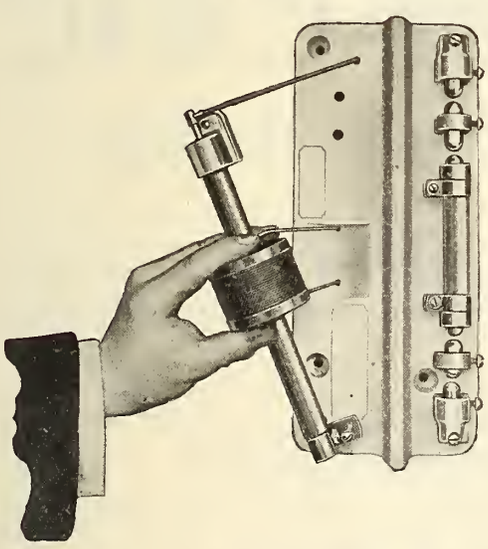
Agents for Electrical Cranes, Hoists, Transfer Tables, Motors, Gas Engines, Rolling Mill Machinery, Blowers of all types, Oil Pumps, etc., etc.

Plans and Specifications Prepared.

Mechanical Engineering Company, Limited

129 Mill Street, MONTREAL.

If You Took This Off—



Do you realize that the Garton-Daniels Lightning Arrester does far more for you than simply protect your electrical apparatus from Lightning?

Tear its circuit-breaker off; throw it away!

And the Garton-Daniels Lightning Arrester **without its circuit-breaker** will still have every feature that any other lightning arrester has—small air gap distance and low series resistance.

It would still give you efficient lightning protection; it would eliminate surges and other voltage disturbances during storms. But it would not give you complete lightning protection, because then, like other lightning arresters, it would at times ground and short-circuit your lines.

Put its circuit-breaker on, and you get the only complete lightning arrester on earth, for now it adds to its other advantages those of absolutely preventing grounds and short-circuits during storms.

Lightning will soon be here—why delay your protection? Write us now for our 1914 Catalogue—also for the **unconditional guarantee** under which every A. C. Arrester is sold.

John Millen & Son, Limited

MONTREAL TORONTO WINNIPEG VANCOUVER VICTORIA

Sole Canadian Representatives of Electric Service Supplies Co., Philadelphia.

Address all correspondence to 321 St. James St., Montreal.

3 Second-Hand Motor Cars Good as New

At a Very Low Price

We have three second-hand No. 19 Fairbanks-Morse Gasoline Motor Cars, as shown here, that are genuine bargains, as we will sell them at a very low price. These cars have been thoroughly overhauled and are in first-class operating condition. With fair treatment they will give practically as long service as new cars. They will make

No. 19 Fairbanks-Morse Gasoline Motor Car.

First-Class Business Cars for Local Division Officials

Each car is equipped with a Sheffield four-cylinder, 25 h.p. gasoline engine. The engine is placed well up above the track, practically in the car itself, and enclosed in a covered casing. The drive is by a roller chain to one axle.

The car may be operated from either end.

The total seating capacity is 19 persons. There are three long cross seats, each seating five persons, and four single seats at engine casing, all with reversible backs.

Each car is fitted with interior hot water heating coils. The maximum speed is about 20 miles per hour. Weight of car about 9,000 pounds

Write to us at once for complete specifications and price.

The Canadian Fairbanks-Morse Company, Limited

"The Departmental House for Mechanical Goods"

84-98 ST. ANTOINE ST., MONTREAL

CANADIAN PACIFIC

WHEN YOU TRAVEL, TRAVEL IN COMFORT

The Canadian Pacific offers to the travelling Public, service and equipment second to none. They build, own, and operate their Compartment Observation Cars, Standard Sleepers, Dining Cars, Coaches and Motive Power.

The Canadian Pacific own and operate a line of palatial hotels along the Railway from Atlantic to Pacific, thus affording their patrons every possible comfort.

The Canadian Pacific can ticket you around the World, and enable you to travel over two-thirds of the World's journey on their own trains and steamers.

Those contemplating a trip will receive full details and literature from any C. P. R. Agent, or write,

M. G. MURPHY,
District Passenger Agent, Toronto, Ont.

STEEL SHIPBUILDERS

Engineers and Boilermakers

Steamer Kwasind built for Royal Canadian Yacht Club, Toronto

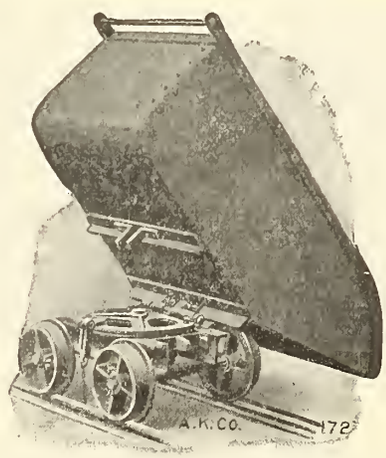
Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows

Marine Engines and Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

Scoop All Around Dump Car



This car is especially designed for mines and for the conveyance of wet materials, such as concrete, mortar, wet sand, ashes, etc.

It is built without doors, and the discharging end is fashioned into the form of a scoop, which is an excellent construction for placing the load where it is desired, as the body is built on a swivel turntable.

This type of car is built for 12 to 18 cubic feet capacities and for 18, 20 and 24-inch gauges.

Orenstein-Arthur Koppel

Are manufacturers of Portable and Industrial Railways, Narrow Gauge Sidings, Turntables, Switches, Frogs, and Cars of all types and sizes. Let us send you their catalogue.

SALES AGENTS

The Canadian Fairbanks-Morse Co., Limited

St. John Quebec Montreal Ottawa Toronto
Winnipeg Saskatoon Calgary Vancouver

NICHOLSON MADE

ON TIME

and in the shortest time, is the way things must be done in railway work.

And that's a mighty strong argument in favor of NICHOLSON-Made-FILES.

They cut deeply—they "feel" right—and their high quality never varies from year to year.

Naturally, this means lower filing-costs. Likewise, it spells swifter and more accurate work.

In fact, there is only one way to better the present efficiency and economy of NICHOLSON-Made-FILES. And that is—to use MORE files. To use two where one now answers. To throw away half-worn files.

To use MORE Nicholson-Made-Files is to reduce filing-cost to the lowest possible point. The trifling expense of the extra files is saved many times over in increased output and decreased time.

NICHOLSON-Made-FILES *Brands:* Kearney & Foot, Great Western, American, Arcade, Globe

At Your Dealer or Supply House.

NICHOLSON FILE COMPANY

PORT HOPE - - ONTARIO

"FILE FILOSOPHY"—A 50 years' education on files in an hour, and our Catalog, sent FREE on request.

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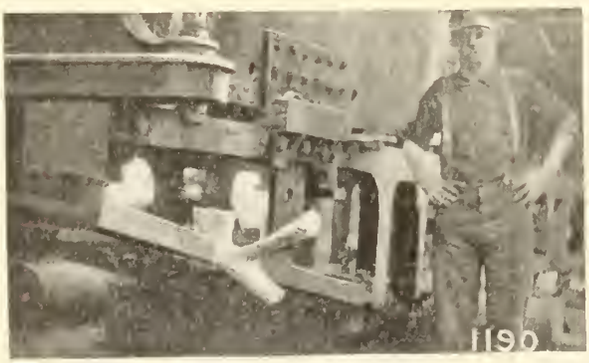

Finished Thermit Weld on Engine No. 802 of the Grand Trunk Pacific, Transcona, Man.

Frame Welded with Thermit by the Illinois Central, Centralia, Ill

Thermit Welding Will Save You from $25 to $250 on Every Frame Weld

Scarcely any dismantling is required where locomotive frames are welded with Thermit, as it is only necessary to provide room for the mold box around the parts to be welded together. It is common practice to complete a locomotive frame weld and return the engine to service in twelve hours or less.

The mechanical officials of 419 railroad shops in the United States, Canada and Mexico are using Thermit regularly and taking advantage of the very large saving which the Thermit process makes possible.

The initial cost of installing materials is so small that the saving on just one job is usually sufficient to cover it. Full information regarding the process will be found in our pamphlet 2144, which will be sent promptly on request.

GOLDSCHMIDT THERMIT COMPANY

WILLIAM C. CUNTZ, Gen. Mgr.
103 Richmond St. W., Toronto, Ont.
329-333 Folsom Street, San Francisco
90 West Street, New York
7300 South Chicago Avenue, Chicago

Increasing Traffic Capacity Without Increasing Equipment

There are two problems which often confront a railway management. First—how to give better service and increase the revenue without increasing the rolling stock or platform expense.

Secondly—how to get the traffic over a single track line without putting in more sidings, or, perhaps, double tracking.

The first situation can be met satisfactorily by increasing the schedules, thus reducing the running time, and thereby increasing the number of runs per car per day. G. R. S. Continuous Track Circuit Automatic Block Signals make such travel safe, and help maintain schedules more closely.

The second situation, that of postponing double tracking, can be met by facilitating traffic by means of G. R. S. Absolute Permissive Block System.

A. P. Block System means absolute indication for opposing movements and permissive indication for following movements.

It is the one always-safe signal system which provides for maximum single track capacity at minimum cost.

It is the one system that makes variable meeting points absolutely safe, and prevents one delayed car from demoralizing the schedules.

Our proposition solves your traffic problem.

General Railway Signal Co. of Canada, Limited

Lachine **Quebec**

CANADA WIRE & CABLE CO., LIMITED CANADA TORONTO CANADA

CANADA WIRE & CABLE CO., LIMITED CANADA TORONTO CANADA

Where QUALITY counts in

WIRES AND CABLES

BARE and INSULATED WIRES, RAILWAY and POWER FEEDER CABLES in Copper or Aluminum. COPPER TROLLEY WIRE COPPER CLAD WIRE (Duplex Metals) GALVANIZED STEEL STRAND GUY WIRE.

Stocks of wire and cables carried at Toronto, Montreal, Winnipeg and Vancouver.

Canada Wire & Cable Co., Limited

1160-1170 Dundas Street

Toronto - - Canada

Sales Offices:

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A. E. Esling, 150 Princess St. Winnipeg, Man.

Macdonald, Marpole Co., Limited 427 Seymour St. Vancouver

CANADA WIRE & CABLE CO., LIMITED CANADA TORONTO CANADA

CANADA WIRE & CABLE CO., LIMITED CANADA TORONTO CANADA

A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

taught by this widespread use of Pay-As-You-Enter Cars is obvious. Increased Revenue, Accident Elimination and Schedule Improvement have been demonstrated in every case. Isn't all this sufficient to show that it always pays to operate the Pay-As-You-Enter Car? Why not remodel some of your present cars?

We license manufacturers and railways to build and use the Pay-As-You-Enter Car, the Patents on which are owned by

ROSS & McDONALD, PATENTEES - - 526 TRANSPORTATION BUILDING, MONTREAL

American Flexible Staybolts

Manufactured in Montreal

Made of the best standard staybolt iron, adding flexibility by process of making as shown above—closely approximating a rope structure.

Write for booklet on subject.

TAYLOR & ARNOLD, Limited

MONTREAL **WINNIPEG**

"CHAMPION" TOOL HOLDERS

"The holder with the big head"

The "**Champion**" line of Tool Holders hardly require introduction. They are known wherever Tool Holders are used. Every Tool is **drop-forged** and absolutely case-hardened and up-to-date. "**Champion**" stands for all that's best in Tool Holders.

L. S. Starrett and Brown & Sharpe's Machinists' Fine Tools. We carry full lines of these and make a specialty of **Machinists' Tool Chests.** Call or write for full particulars.

H.R.D. High Speed Steel manufactured by Cammell, Laird & Co., Sheffield, for use with lathe, planer and shaper Tools.

H.R.D. Steel is tougher and stronger than any other Tool Steel made and carries a finer edge.

Write for Circulars.

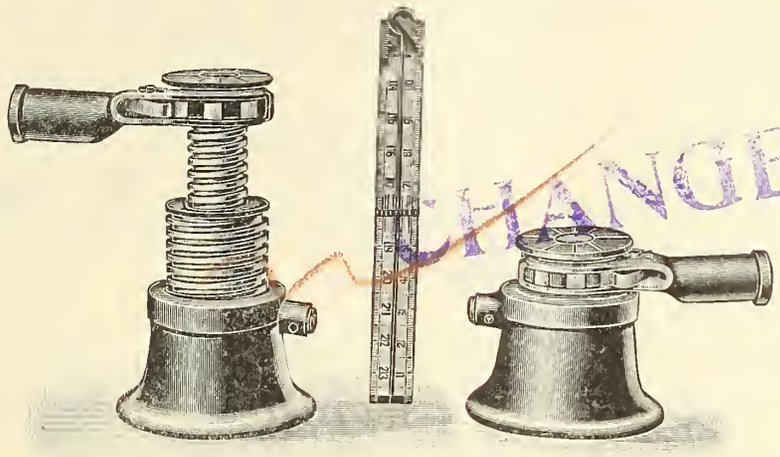
Rice Lewis & Son, Limited, Established 1847 **Toronto**

YOUNGS' PATENT TELESCOPIC JACKS.

NOTICE HEIGHT WHEN RUN-OUT

— ASK FOR LIST No 46 —

RYLAND ST. WORKS,



NOTICE HEIGHT WHEN DOWN

— ASK FOR LIST No. 46 —

BIRMINGHAM, ENGLAND.

Algoma Steel Corporation, Limited

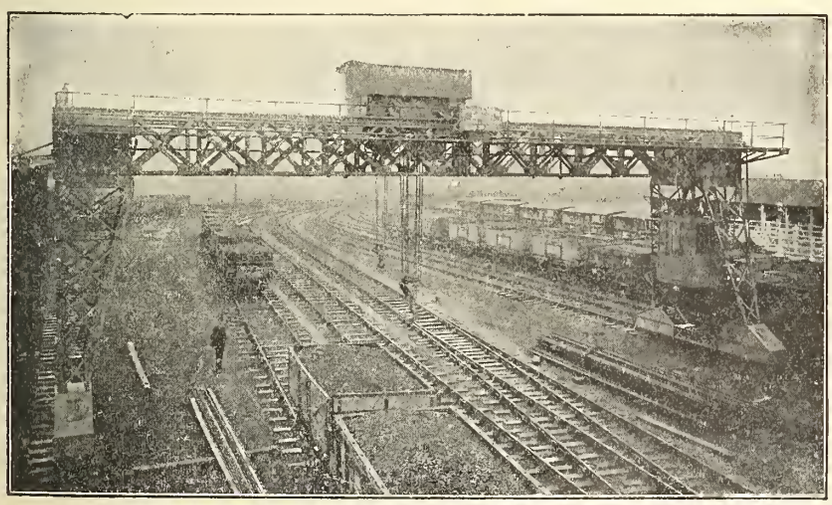
Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1914 deliveries.

Works : Sault Ste. Marie, Ontario, Canada

General Sales Office : 606 McGill Building, Montreal, Quebec



The G. and S.W. Rwy., Albert Harbor Goods Station, Greenock, N.B.
"B. & W." 30 Tons Electric Travelling Goliath Crane, 70 Feet Span

Babcock & Wilcox

LIMITED

PATENT

Water Tube Steam Boilers

Over 10,000,000 H.P. in Use

White-Forster Water-Tube Marine Boilers

ELECTRIC CRANES

For Docks, Railways and Warehouses

Our Book STEAM Sent on Request

HEAD OFFICE FOR CANADA,

St. Henry, MONTREAL

Toronto Office, Traders Bank Building

The Railroads of Canada and the United States, not only by their adoption of ***The Bird-Archer Company's Polarized Mercury Boiler Treatment for Locomotives,*** *show that they know the claims made for same are correct, but further prove this fact by extending the use of same to more power every month. This can be very easily proven to you.*

This treatment will

Remove Scale,
Extend Flue Mileage between shoppings from 80 to 100 p.c.,
Lessen Flue and Stay-Bolt Troubles,
Decrease Wash-Outs from 50 to 80 p.c.,
Stop Leaking,
Lessen the Possibility of Cracked Sheets.

CHANGE

Home Office, 90 West Street, New York City Laboratory and Factory, Philadelphia, Pa.
Canadian Factory, Winnipeg, Manitoba

OXYGEN

By "Claude Liquid Air Process"

Large quantities supplied in high pressure cylinders.
MOST UP TO DATE Welding and Cutting Plants.

Ask for Catalogues.

L'AIR LIQUIDE SOCIETY

MONTREAL
1 Ernest St., Maisonneuve

W. TORONTO
Boler St.

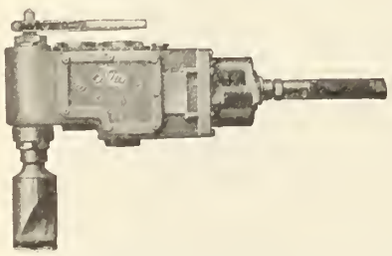
WINNIPEG
325 William St.

Thor

Close Corner Piston Air Drills

Are the Original No.'s 8 and 9 Close Quarter Machines

Equipped with Roller Bearings which reduce friction to a minimum. Guaranteed 30 per cent. more efficient than any other make. Sent on trial at our expense.



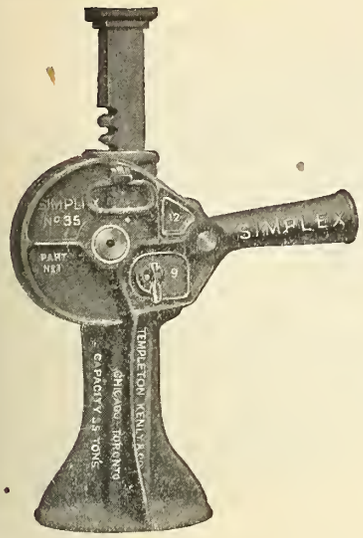
Made especially for use in close quarters where the ordinary air drill cannot be operated.

BUILT IN TWO SIZES:

No. 8 for drilling up to 1 1-4 in. in diam., Reaming and Tapping up to 1 in.

No. 9 for drilling up to 3 in. in diam., Reaming and Tapping up to 2 in.

INDEPENDENT PNEUMATIC TOOL COMPANY
THOR BUILDING, CHICAGO, ILL. 170 BROADWAY, NEW YORK, N. Y.
Canadian Representatives: H. W. PETRIE, LIMITED, - TORONTO, MONTREAL, VANCOUVER
W. H. ROSEVEAR & SON, WINNIPEG



SAFETY FIRST

Enquire about the No. 35 Simplex Heavy Duty geared ratchet Jack for loaded car work. Much faster to raise and lower the load than the fastest ball-bearing Jack of equal capacity.

Manufacturers of the celebrated Simplex Track Jacks.

Sample pairs cheerfully loaned at our expense for testing.

CAPACITY 10 to 40 TONS

Manufactured by

Templeton, Kenly & Co., Limited

78 Duchess Street, TORONTO, ONT.

Complete stock carried by

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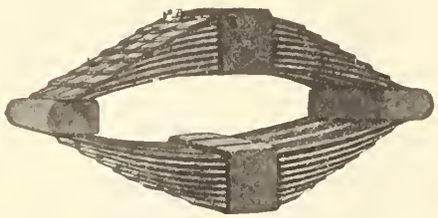

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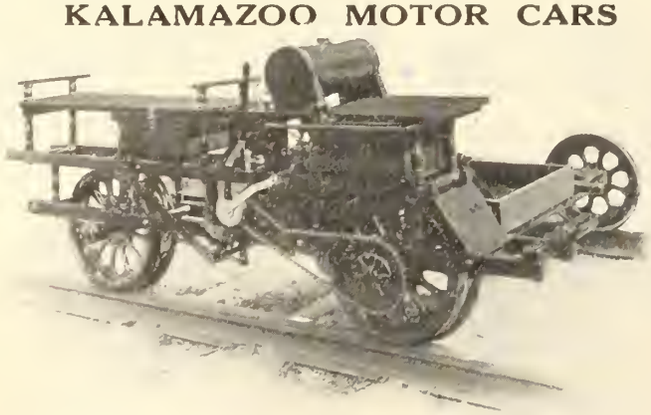

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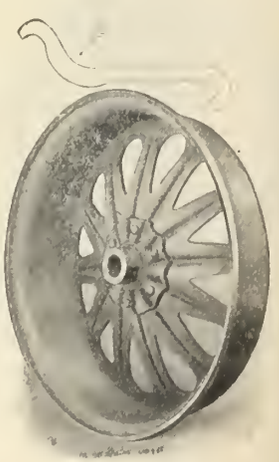

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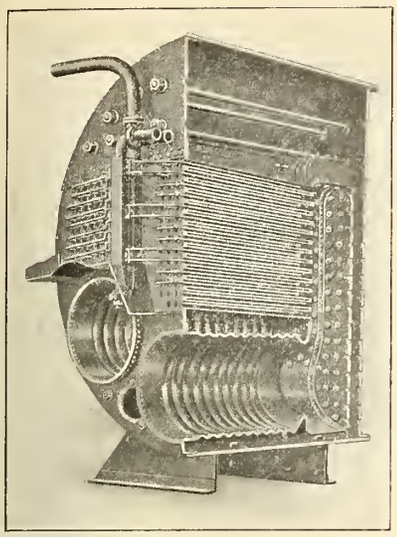

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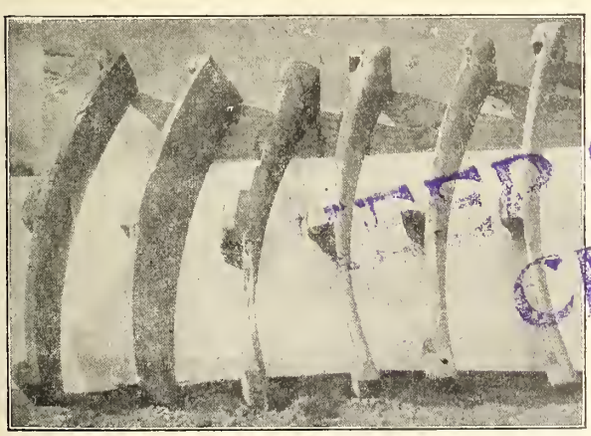

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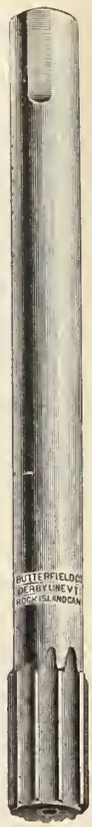

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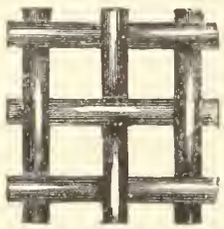

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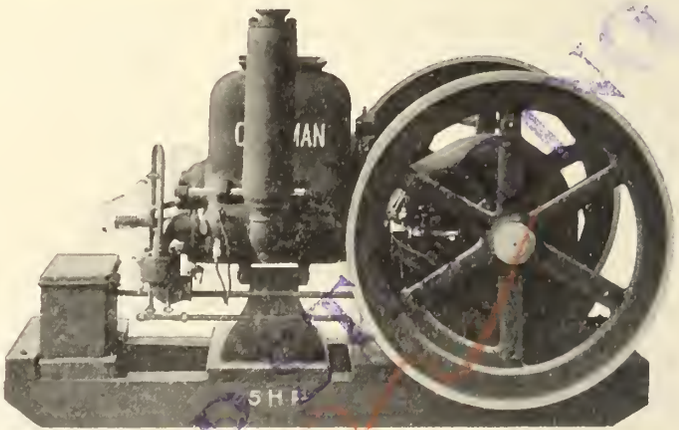

All working mechanism on one plate. Only 20 pieces.

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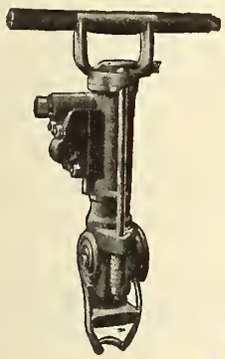

It is an all-steel hand hammer drill with an automatic rotation and an automatic oiling device. It also has the non-freezing "Butterfly Valve", an efficient hole cleaning device and a handy steel-holder.

It reduces drilling costs for all down holes of medium depth.

The up-keep is negligible because of the simple all-steel construction.

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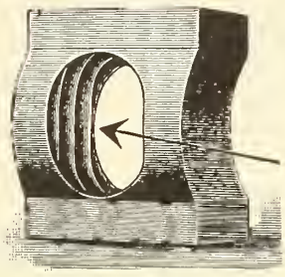
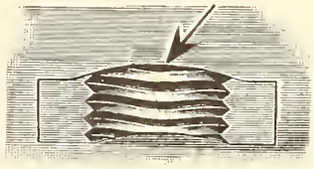
20th Century Nut
The Grip Nut





This cut shows an exaggerated curve in pitch thread—or more than is given in practice, in order to emphasize this feature.

The vise-like grip obtained on the threads of bolts by the application of Grip Nuts secures a result different from that of any other locking device, for the reason that it resists equally in both directions, and is entirely independent of anything but the bolt for its locking action. The Grip Nut does not injure the threads of the bolt, and can be applied and re-applied.

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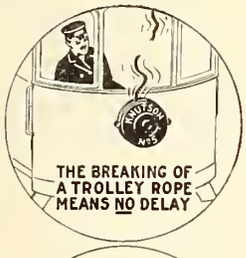

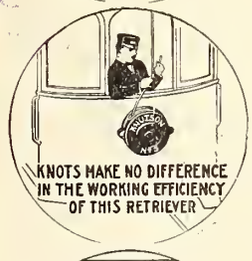

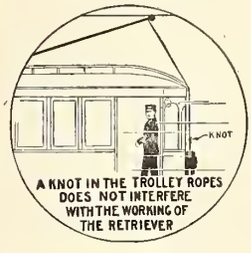

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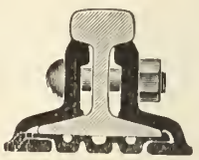
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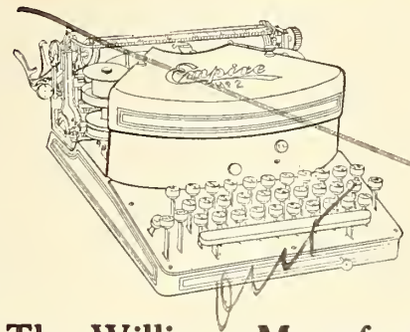

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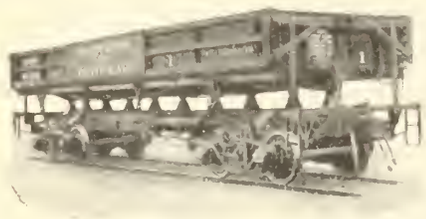

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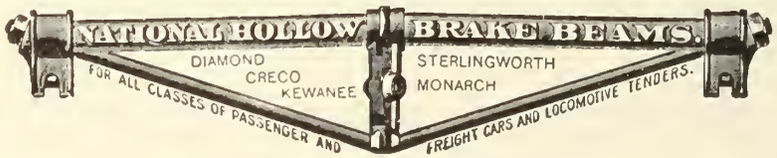

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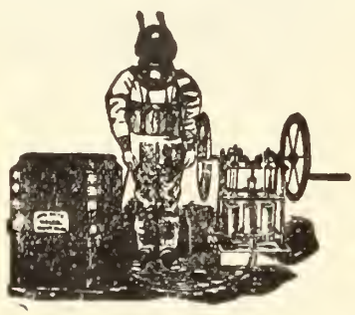

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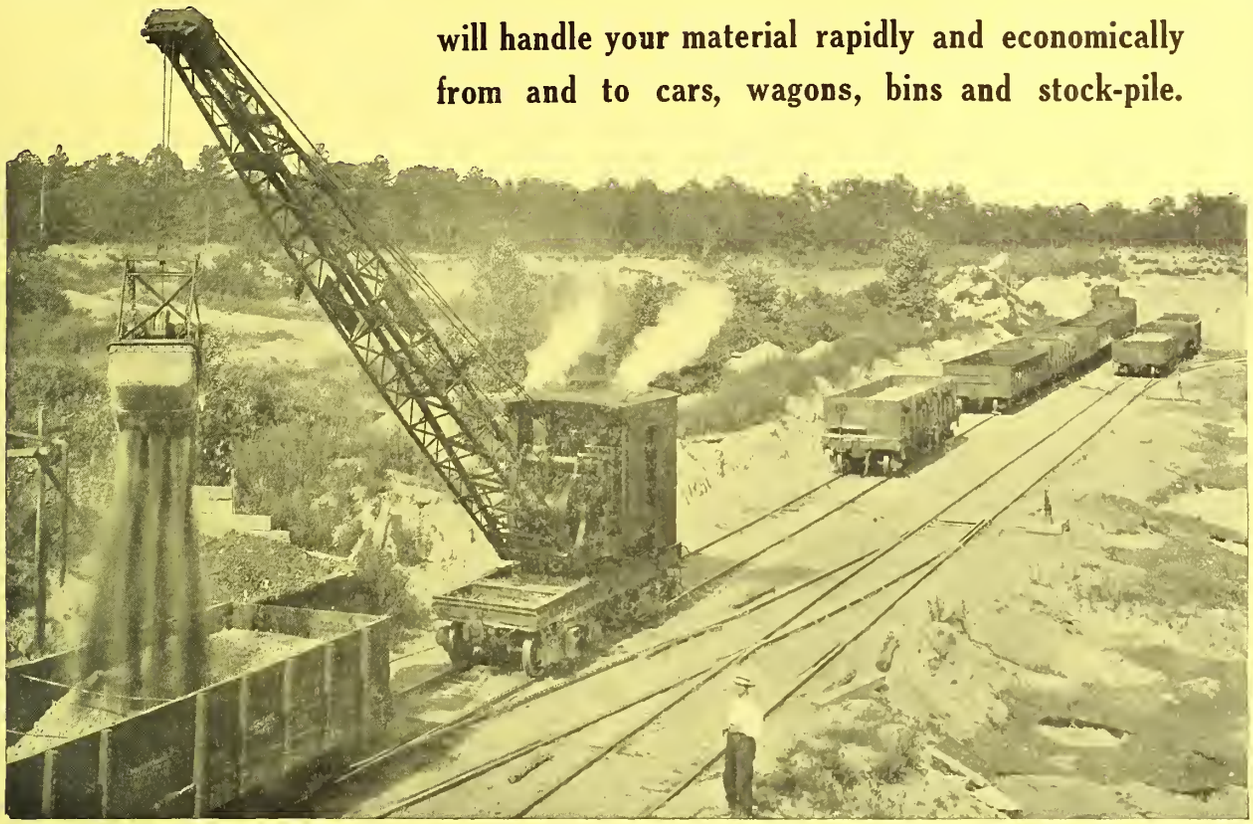

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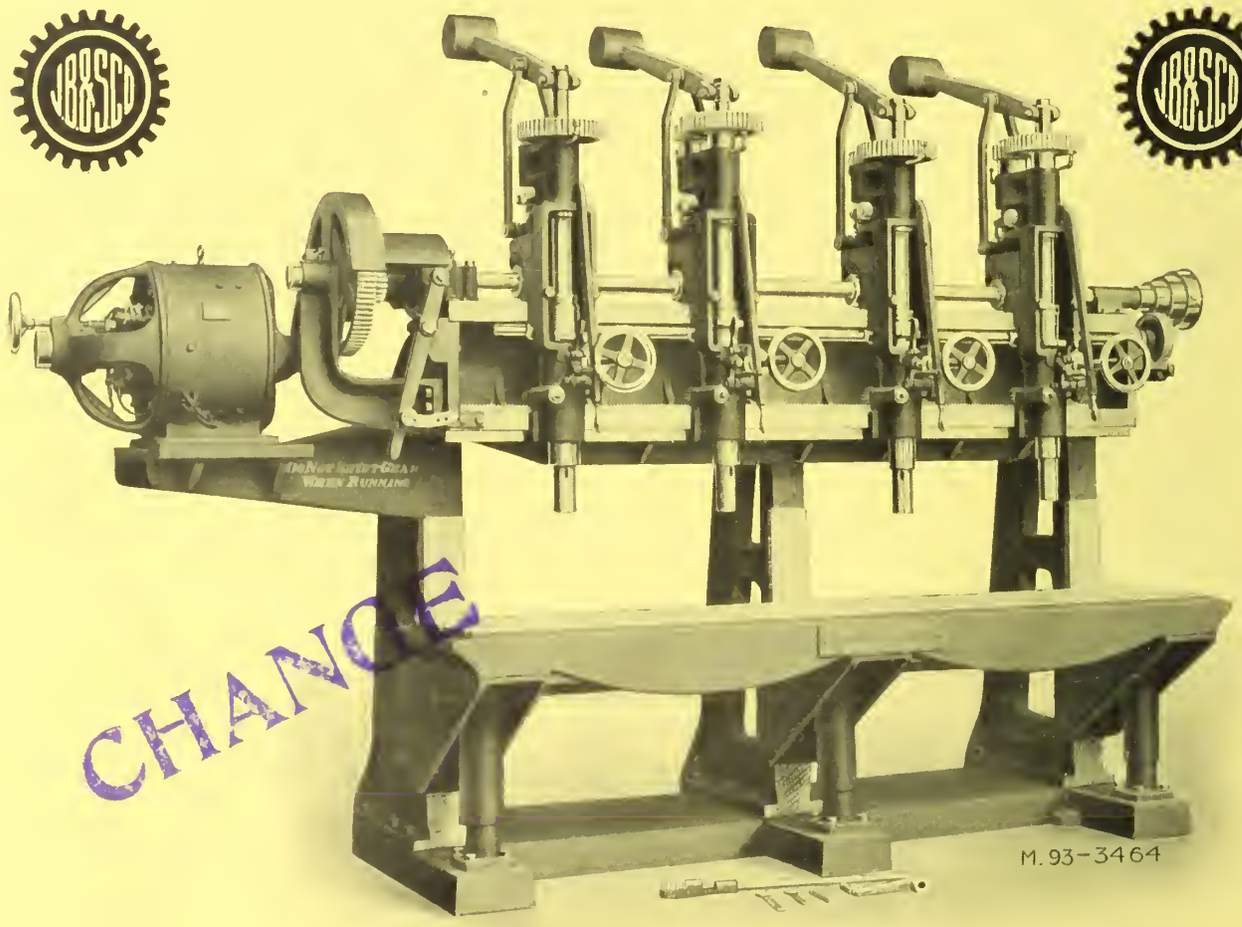

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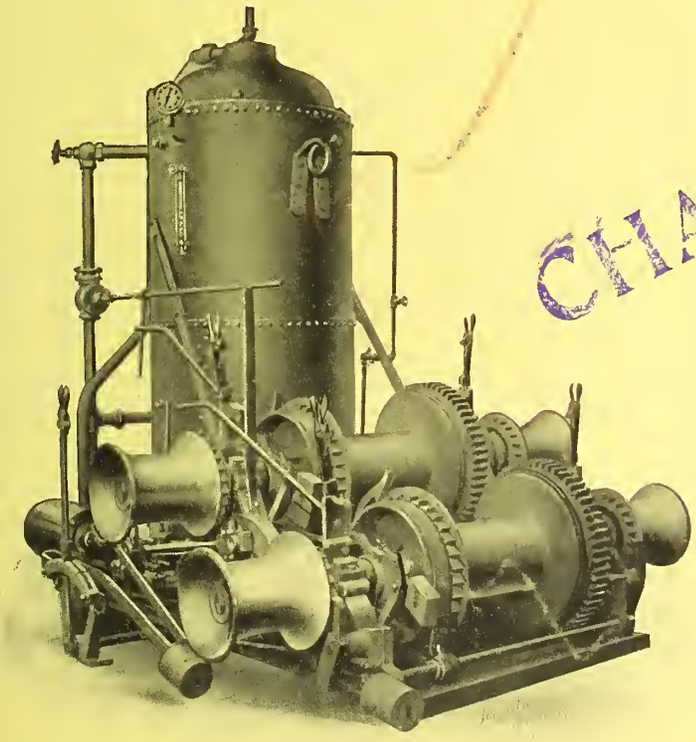

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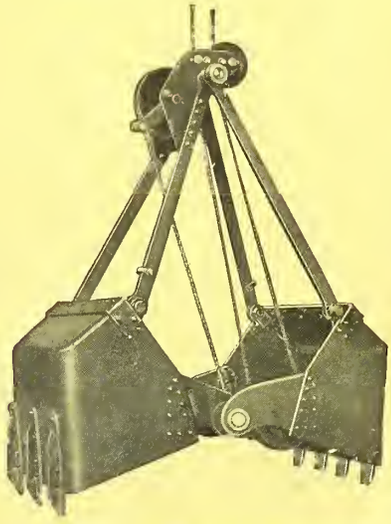

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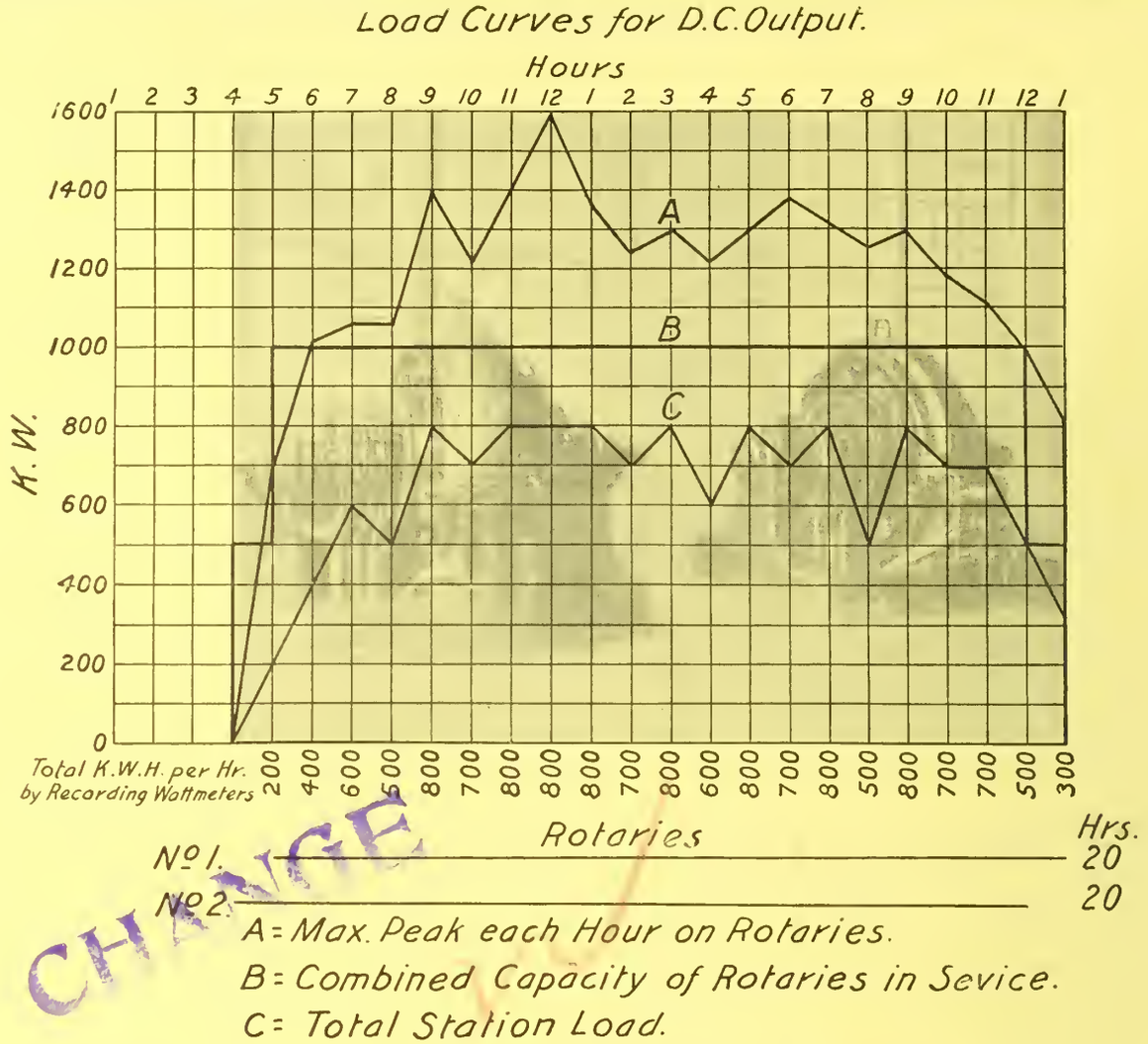

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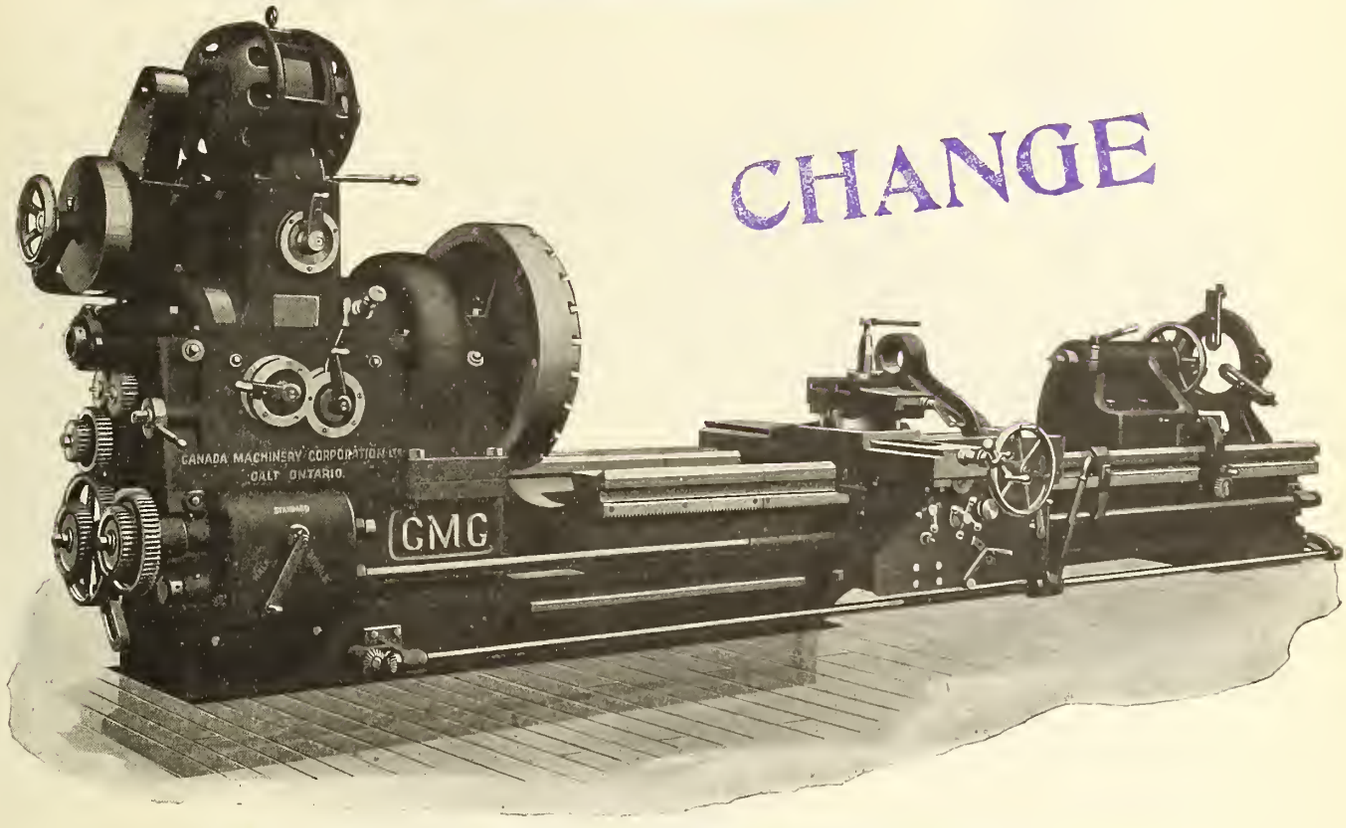

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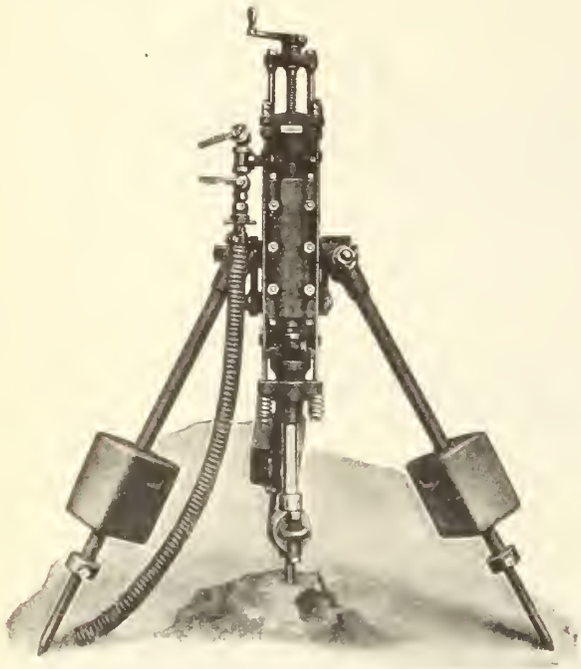
The A. R. Williams Machinery Co., Ltd.,
Winnipeg

Canada Machinery Corporation, Ltd.

GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.



CONTRACTORS' EQUIPMENT

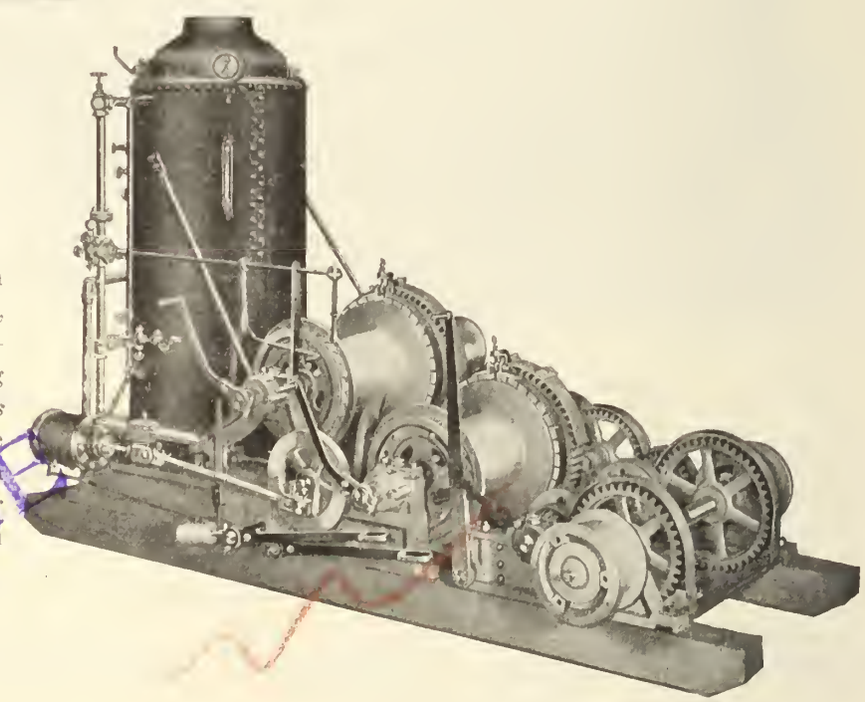
McKIERNAN-TERRY DRILLS

We are exclusive agents in Canada for McKiernan-Terry Rock Drills, Pile Hammers, Core Drills, Atlas Ball-bearing Jacks and Mining and Quarrying Machinery.

The Corliss Valve Drill (here shown) is economical in power, strikes a quick and powerful blow, and has a pull-back of remarkable strength. It is as well adapted for use with air as it is for steam. When required to work with low pressure or "wet" steam, it shows greater superiority over all other drills, and under such conditions it operates with a degree of flexibility only expected of an air machine.

LIDGERWOOD HOISTING ENGINES

We are exclusive agents in Canada for the Lidgerwood Hoisting Engines, Cableways, Derricks, Unloaders, Scraper-Bucket Excavators and Logging Machinery. The hoist here shown is our standard double cylinder, double friction driven engine with boom swinging gear. Specially adapted for railway work, pile-driving, dock and bridge building.



CHANGE

CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

LIDGERWOOD—CRAWFORD

SCRAPER BUCKET EXCAVATORS

Electrically-Driven Drag Line Excavator, with 100 ft. boom and 2½ cubic yard bucket on canal work.

The "**Lidgerwood-Crawford**" **Scraper Bucket Excavator** will make a complete revolution, will dig and deposit the load at any point within the circle, and will move by its own power, being mounted either on hardwood rollers, truck wheels or trucks, as elected by the purchaser.

The machine is especially adapted for open cut work of all descriptions, sits on top of its work, and either backs away or moves forward upon the filling accomplished by it. Is especially adapted to digging irrigation and drainage ditches, making railroad embankments and levees, stripping overburden from and digging gravel, coal, phosphate matrix, iron ore, placer mining, etc. Will dig under water. Can be equipped with either steam or electrical power and is operated by the "Crawford" patented Pneumatic Control of frictions. Can be used as a revolving derrick or pile-driver.

Exclusive Agents in Canada.

CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

HEAD OFFICES, TORONTO. District Sales Offices, Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

INVESTIGATE OIL COOLED TRANSFORMERS

"Simple Corrugated"

—

"Compound Corrugated"

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"Tubular"

—

and "Radiator" Types

Maximum Reliability

—

Highest Efficiency

—

Especially Adapted to Outdoor Service

One of twelve "tubular" oil cooled 1,000 k.v.a. 55,000 volt transformers recently built at Peterboro Works.

Available in Unit Capacities up to 4,000 K. V. A.

Let us send you detail information on transformers to meet your particular condition, designed to meet the severest operating strains arising from over-voltage, over-current, or over-frequency.

CANADIAN GENERAL ELECTRIC COMPANY,

LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

BRIDGE DEPARTMENT

CANADIAN ALLIS-CHALMERS, LIMITED

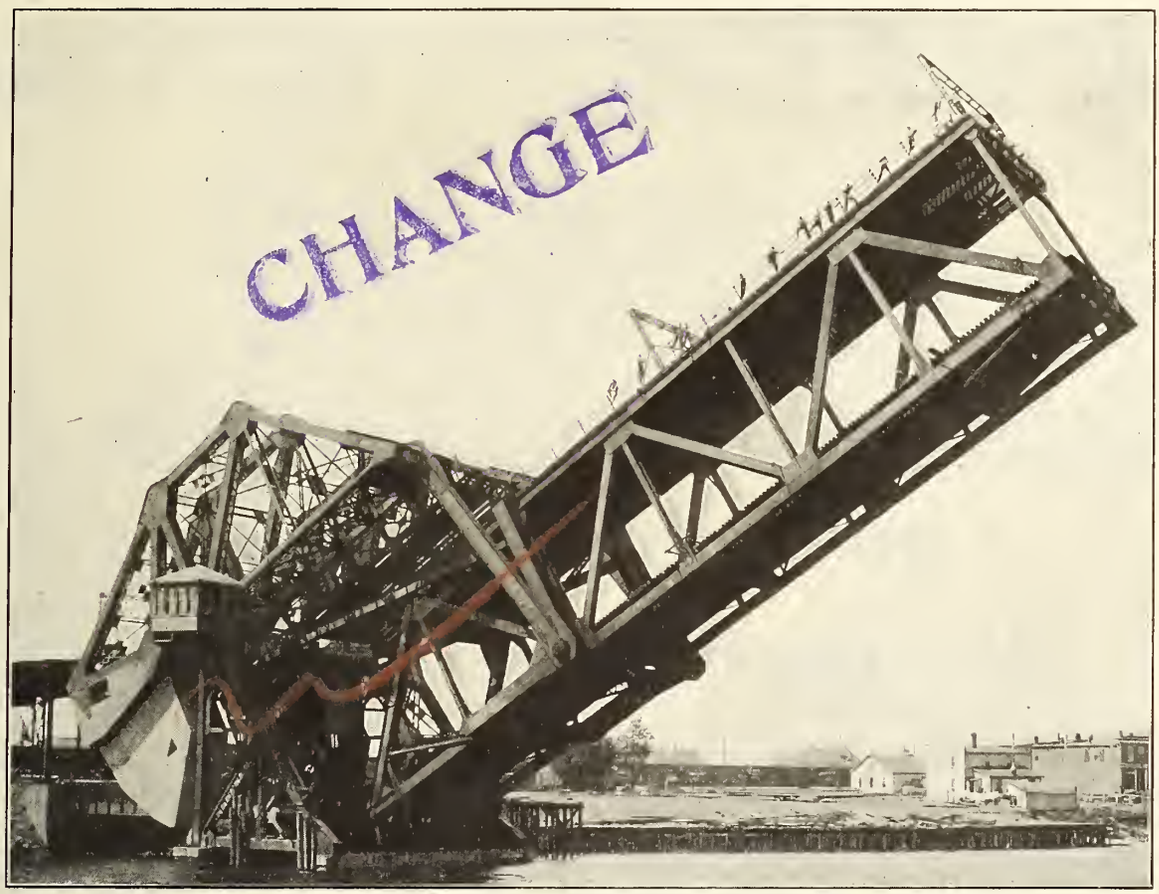
TORONTO, ONT.

SHOPS AT

TORONTO, ONTARIO BRIDGEBURG, ONTARIO

Manufacturers of

Bridges, Turntables and All Kinds of Steel Buildings



C. P. R. Bridge Over Kaministiquia River at Fort William, Ontario

Largest Double Track, Double Deck Bascule Lift Bridge in the World.

BUILT, EQUIPPED AND ERECTED BY BRIDGE DEPARTMENT

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LIMITED

TORONTO - - ONT.

THE
Steel Company of Canada
LIMITED

Railroad Track Equipment
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Steel Track Spikes Bolts & Nuts

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Foundry Basic Malleable

Car Axles and Forgings
Invincible Fencing
Bar Iron Bar Steel

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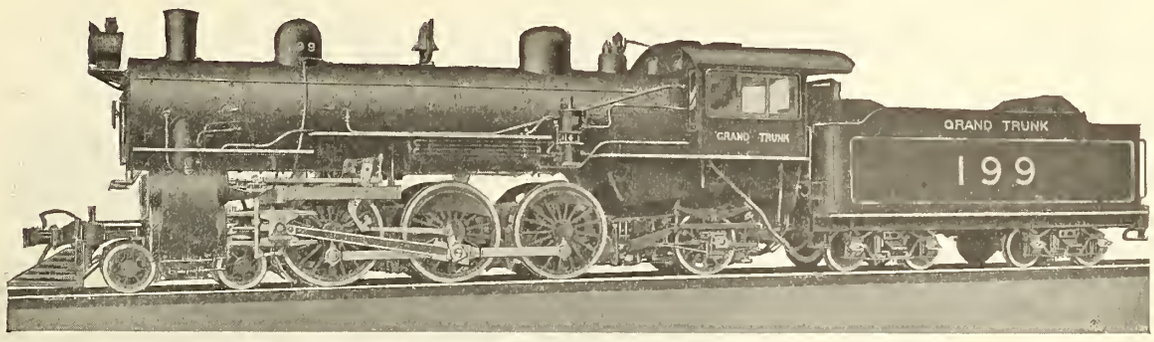
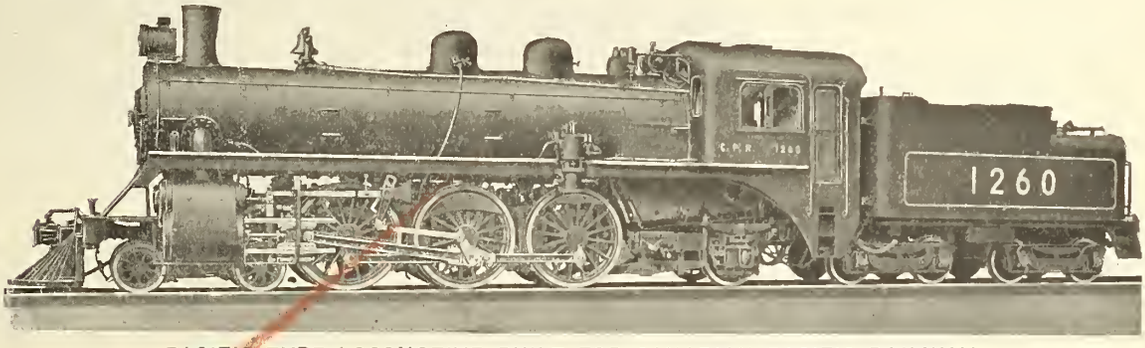
FOR FAST PASSENGER SERVICE



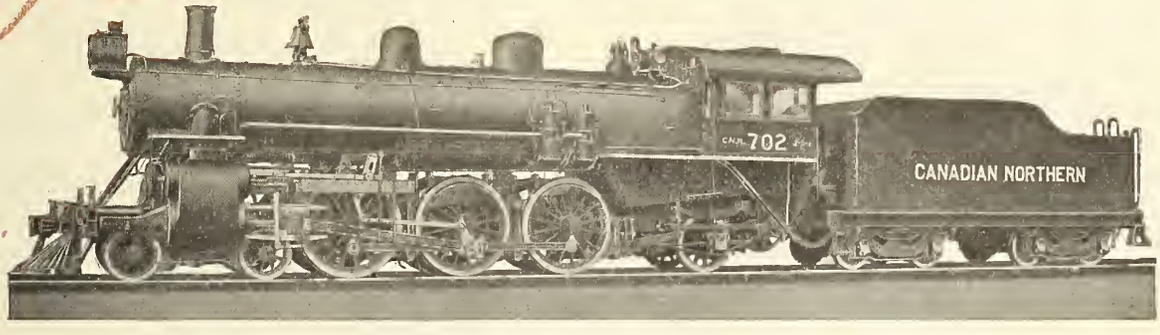
PACIFIC TYPE LOCOMOTIVE BUILT FOR GRAND TRUNK RAILWAY.

Total Weight of Engine, 226,000 pounds; Weight on Drivers, 145,500 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 185 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power. 33,900 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN PACIFIC RAILWAY.

Total Weight of Engine, 223,000 pounds; Weight on Drivers, 142,000 pounds; Diameter of Drivers, 70 inches; Boiler Pressure, 200 pounds; Cylinders, 22½ x 28 inches; Maximum Tractive Power, 34,500 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN NORTHERN RAILWAY.

Total Weight of Engine, 216,000 pounds; Weight on Drivers, 136,400 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 170 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power, 31,100 pounds.

These locomotives represent the combined knowledge and experience of the officials of the roads and builders.

They were designed and built to fit the physical and operating conditions of the roads.

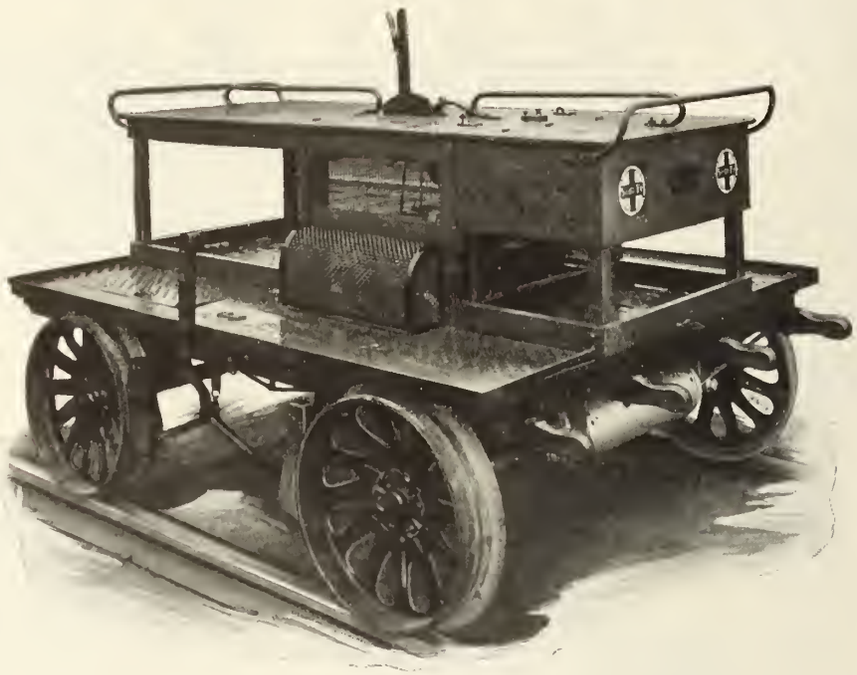
They include only features which have been thoroughly proven in service, skillfully combined in proportions known to be correct.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

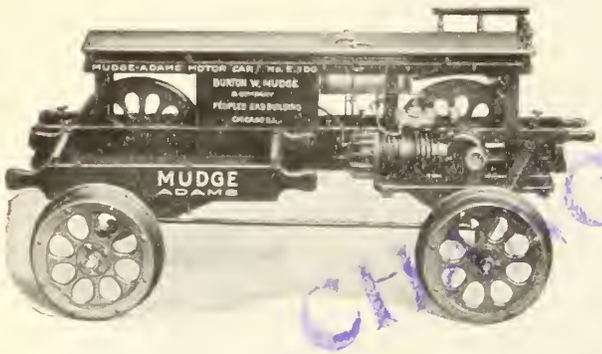
DOMINION EXPRESS BUILDING, MONTREAL, CANADA

ARE YOU ASKING YOUR MEN

To do a lot of work before they get to their field of labor?



A MUDGE-ADAMS Motor Car will take them to work in one third to one half the time required with the hand cars and then your men are fresh and ready to work.



Your present gang with a MUDGE-ADAMS will cover almost double the amount of track. A Mudge-Adams will pay for itself in a few months time.

Carried In Stock

MUSSENS LIMITED

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318 St. James St.	155 West Richmond St.	Opp. Right of Way Mine	259-261 Stanley St.	10th Ave. and 3rd St. East

VANCOUVER	QUEBEC	ST. JOHN, N.B.	HALIFAX
101 Water St.	31 St. Louis St.	57 Smythe St.	78 Granville St.

The Right Way To Value Our Rail Report Bulletins

as exemplified in a letter from the chief engineer of an important western system.

"I beg to acknowledge receipt of your favor of January 15th attaching your Bulletin No. 4, which I am glad to receive and have found of great interest and benefit. I know of no suggestion which I could offer to improve the completeness of these excellent reports, which certainly contain a vast deal of valuable information. I am fully alive to the values derived in the proper use of FERRO-TITANIUM alloy, and shall heartily endorse its use when opportunity is presented."

AND THE WRONG

as stated in a letter from the purchasing agent of a southwestern road:

"I think you are in the best position to determine the value of these to you, as it is purely a question as to the value of an advertising medium. If it gets the business that is what you want. If it doesn't bring in the orders it is of no use to you."

In strictly advertising literature it is unusual for a manufacturer to print anything that is not entirely favorable to the advertised article, whereas in this series of Bulletins we are printing the results of tests on a consecutive series of samples regardless of the fact as to whether a particular test is favorable or not; and we are positive that, sooner or later, this will be generally understood and fully appreciated.

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents. Process and Products Patented.

General Offices and Works T P C Reg. U. S. Pat. Off. TRADE MARK. **Niagara Falls, N.Y.**

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GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Sheffield, England

The Place To Get REAL Signaling Information Is Where Signaling Is Being Done

A man must be a considerable genius to be able to sit at his **desk** and determine definitely about the value of signaling protection for operation over his **railway.**

He must be considerably more of a genius to determine from that same viewpoint the efficiency of a system as demonstrated on a road a thousand miles away from him.

What do you know about the efficiency of the Simmen System as demonstrated and thoroughly proven on four different railways in Canada and the United States? Have you inspected this system?

Is not the problem of signaling protection on your road of sufficient importance for you to **know** what a system as well known as the Simmen System has proven under actual operating conditions for a period of years?

A three days' trip will enable you to make a **personal inspection** of at least two of these installations, where you can determine for yourself by your own observation, as well as by the statements of the operating officials and the man on the job, just exactly the efficiency the Simmen System is giving.

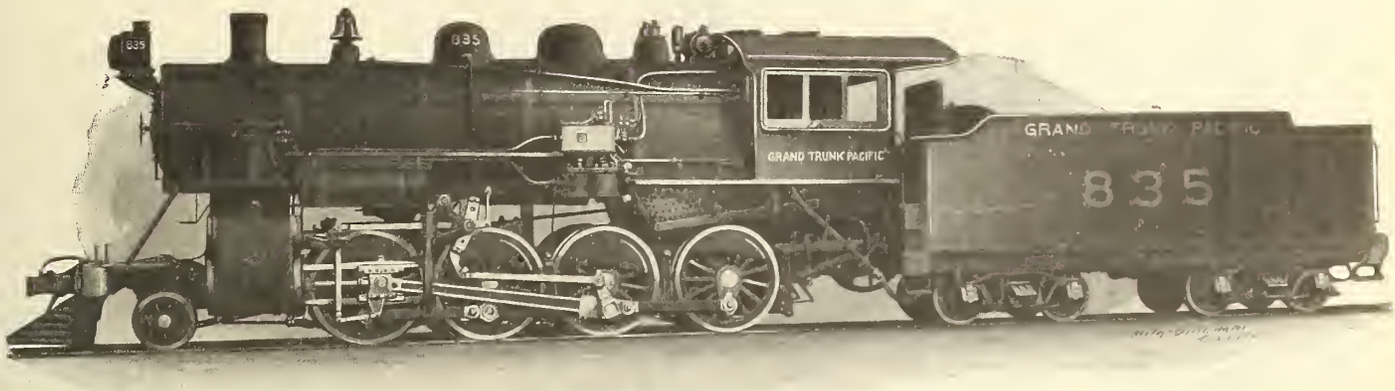
We can and will be glad to send you literature describing the Simmen System. We can and will be glad to send you a competent man who will tell you all about it as applied to **your** individual conditions, make a survey of your road and furnish you with an estimate, if you want it. But if you want to know exactly what the Simmen System is doing and what it can do for **you,** why don't you go and make an investigation yourself? Then you can make intelligent decisions.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

Canadian Locomotives

for contractors, industrial works, railroads, etc.



CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 16 tons. Weight of tender in working order 150,000 lbs.

All locomotives are equipped complete with fittings, fixtures, tools and all appliances necessary for their operation.

If desired, we will furnish with all tenders on standard locomotives, complete detailed specifications, fully describing all construction features, with the various sizes of dimensions noted. Specifications can also be accompanied by photographs showing the type of locomotive proposed, with any modifications clearly mentioned.

We have had a half century's experience which may be useful to intending purchasers in selecting locomotives suitable for peculiar conditions, or where roads are not fully completed or surveyed.

Our plant is now being greatly enlarged. New equipment has been installed and the capacity of the works brought up to an output of about eighteen locomotives a month, which will soon be increased to twenty-five a month. Consult us before purchasing a locomotive!

We are also builders of stationary boilers suitable for contractors or industrial plants.

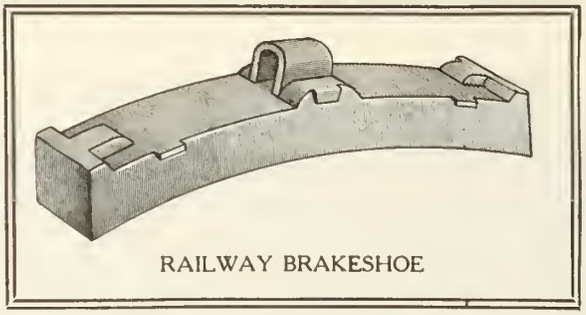
Canadian Locomotive Company, Limited

Kingston - Ontario - Canada

Grey Iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

Our Improved Reinforced
BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.

25-ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

Sherbrooke, Que.

Sole representatives for the sale of our Brakeshoes In the Dominion of Canada outside British Columbia, Messrs. Taylor & Arnold, Montreal and Winnipeg. The Province of British Columbia, The B. C. Equipment Co., Vancouver.

CHANGE

For our weak points—***See our Competitors***

For recommendations—***See our Customers***

For further information—***See Us***

The Electric Railway Improvement Co.

Cleveland, Ohio

Canadian Government Railways

Intercolonial Railway

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CHANGE

The Intercolonial is the only all-Canadian trunk line from Montreal to the Atlantic Sea-board. The Maritime Express, daily except Saturday, leaves Bonaventure Union Depot, Montreal, for Halifax, making connections for St. John, the Sydneys, Prince Edward Island and Newfoundland, and is noted for excellence of sleeping and dining car service. The local passenger service on the Canadian Government Lines, in proportion to the population served, is not equalled in America.

The operation of fast through freights, frequency of local and special freights, and the attention given to patrons of the railway, give every satisfaction to freight shippers.

EDISON BSCO

PRIMARY BATTERY
FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

RSA Cell, 400 Ampere Hours Capacity.

Electricity is required to render unfailing service, no place more urgently than in railway signaling.

And probably the greatest benefit resulting from a system that operates with precision, is the effect produced on those who are governed by signal indications. The fact that an unfailing current source is so essential to clean cut operation has led many companies to conduct severe service tests.

These tests have demonstrated that one cell stands

PRE-EMINENT FOR UNIFORM DEPENDABILITY
THE EDISON-BSCO

and explains why it is universally used for railway signal work.

The Edison-Bsco cell does not suffer by comparison with any other current source. Its low first cost keeps down fixed charges. Its long life, with expense for labor only at renewal periods, keeps maintenance charges at the minimum. The same renewal is used for signal, track and interlocking circuits, thus simplifying the storekeeping economy in stock.

Its simplicity broadens materially the field from which satisfactory maintainers can be selected as opposed to the limited field when complicated power systems are used, and the fact that each signal has its individual power plant with a guaranteed capacity, provides a power source of great reliability.

Catalogue on request.

RSA Barrel Shaped Cell, 400 Ampere Hours Capacity.

The Cheapest Form of Battery Energy

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

Canadian Consolidated Rubber Co.

LIMITED

T. H. Rieder, Vice-President and General Manager.

Executive Offices: Notre Dame St., Montreal, P.Q.

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The Canadian Rubber Co. of Montreal Limited, Montreal, P.Q.
The Granby Rubber Co. Limited, Granby, P.Q.
The Merchants Rubber Co. Limited, Berlin, Ont.
The Berlin Rubber Manufacturing Co. Limited, Berlin, Ont.
The Maple Leaf Rubber Co. Limited, Port Dalhousie, Ont.
Dominion Rubber Co. Limited, St. Jerome, P.Q.
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Rubber Goods BEST BY TEST For All Purposes

Air Brake Hose (Regular) and Special "Non-freezing" Air Signal Hose.
Steam Heating Hose.
Vacuum Hose.
Hot Water Hose (White).
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Heavy Suction Hose.
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Special Moulded Goods for every Mechanical Use.
Tubing—all sizes.
Rubber Strips.

Rubber Boots and Shoes: "Jacques Cartier," "Merchants," "Dominion," "Anchor," Brands.
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Automobile Tires **Truck Tires** **Carriage Tires**

Original "Diamond" Design Inlaid Rubber Tiling. Estimates and Samples cheerfully furnished.

We specialize in Rubber Goods required by Steamboat and Electrical Car Companies. Write for catalogues and prices.

R. E. Jamieson,
General Sales Manager.

J. M. S. Carroll,
District Manager, Montreal.

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You Can't Go Wrong On *Northern Electric* Car Equipment Material

Take the trolley equipment for example: There are stocks of such material in nine of the leading cities in Canada—in every section of the country. And every article in stock has measured up to the Northern Electric standard.

Think what this means to you! No need to put through a dozen purchasing orders to a dozen houses. Any one of our houses can supply all your requirements.

One order to our nearest house will fill all of your demands—immediately.

Write the Electric Railway Department at our nearest house for prices.

CHANGE

Northern Electric Company
LIMITED

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HALIFAX
TORONTO

WINNIPEG
REGINA
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VANCOUVER
VICTORIA

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

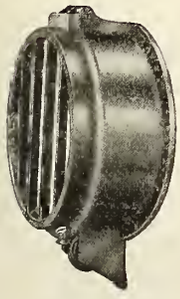
Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

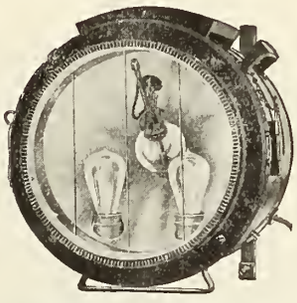
Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

Electric Headlights, Arc and Incandescent



Incandescent—Type W.



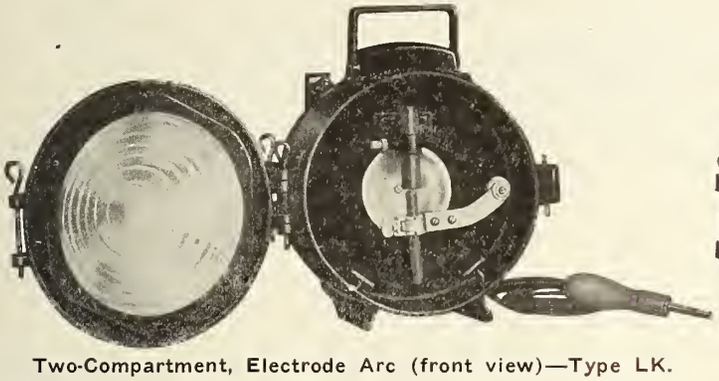
Combined Carbon Arc and Incandescent—Type U.

Carbon Arc, for Marine Use—Type X

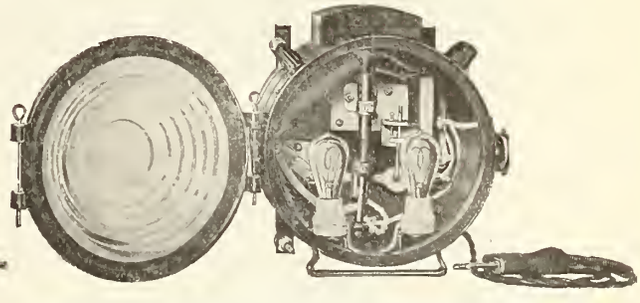
(Front View)

(Side View)

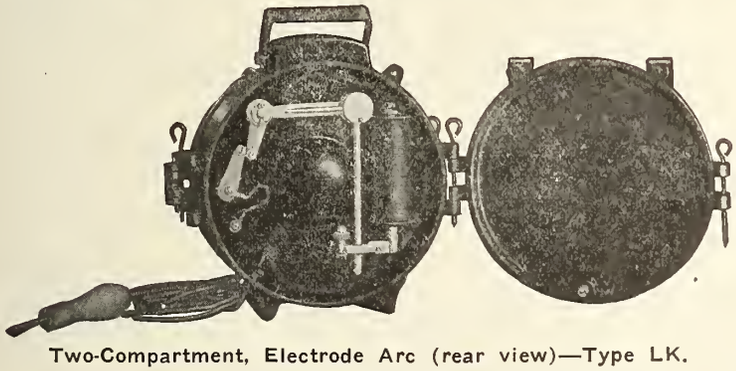
Incandescent—Type Z.



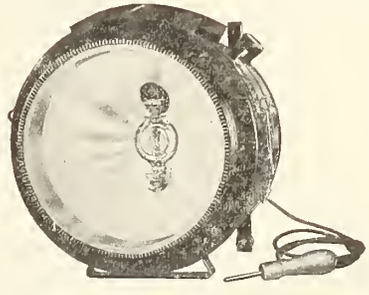
Two-Compartment, Electrode Arc (front view)—Type LK.



Combined Electrode Arc and Incandescent—Type LA.



Two-Compartment, Electrode Arc (rear view)—Type LK.



Carbon Arc—Type J.

Order from your dealer. If he does not stock them, write us.
Mail Coupons for Catalogues.

Crouse-Hinds Company of Canada, Ltd.

Main Office and Works:

Toronto, Ontario, Canada

Kindly send me Arc Incand. Headlight Catalogue.

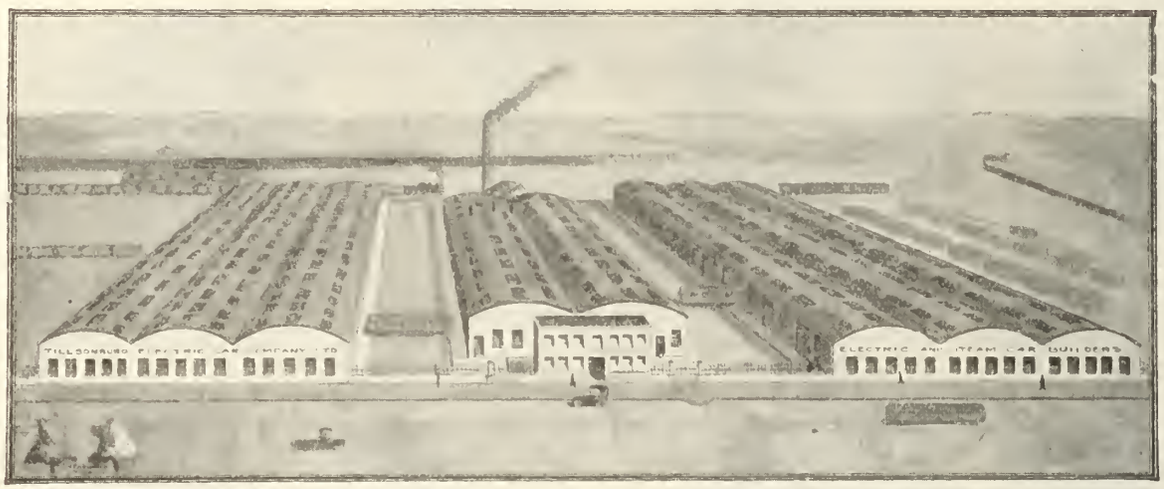
Name .....

Street .....

City ..... Prov. .....

CRMW 4-14.

Dependable Deliveries on Electric Cars



We have already built Freight and Express Cars and now have under construction Interurban Cars.

The plant is capable of catering to your most exacting requirements, and the process of manufacture and methods of workmanship are open for inspection to all electric railway officials.

We are at all times ready to give your specifications and deliveries our best attention.

THE TILLSONBURG ELECTRIC CAR COMPANY, LTD.

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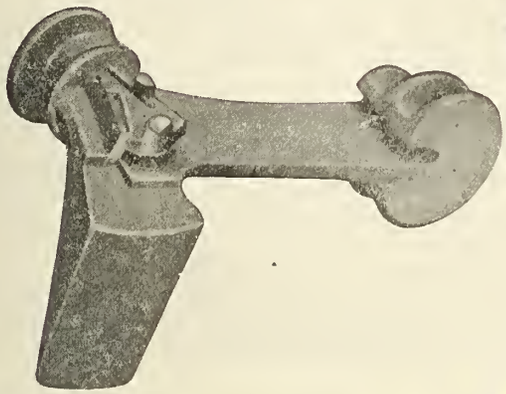

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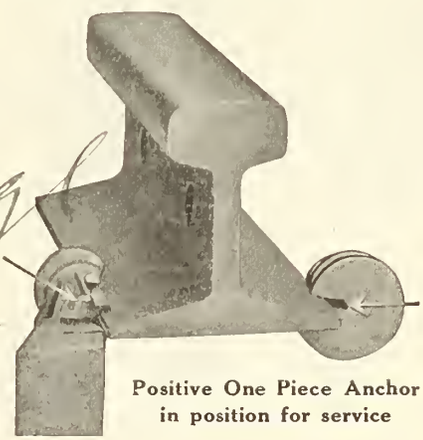

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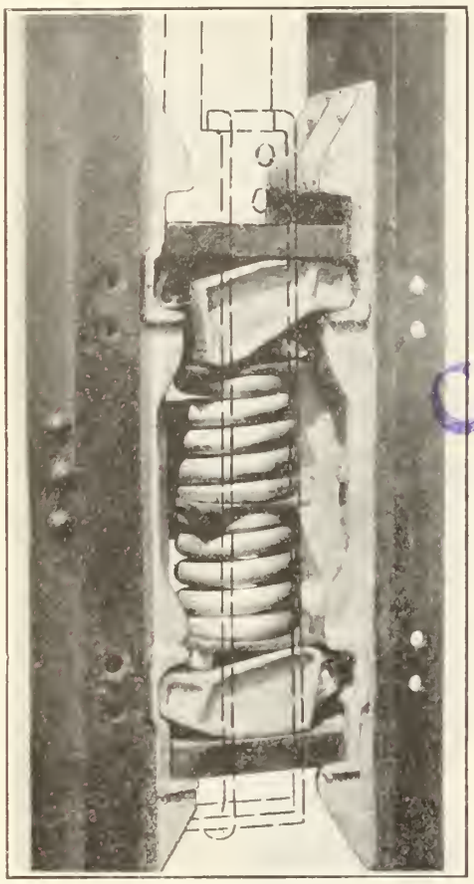

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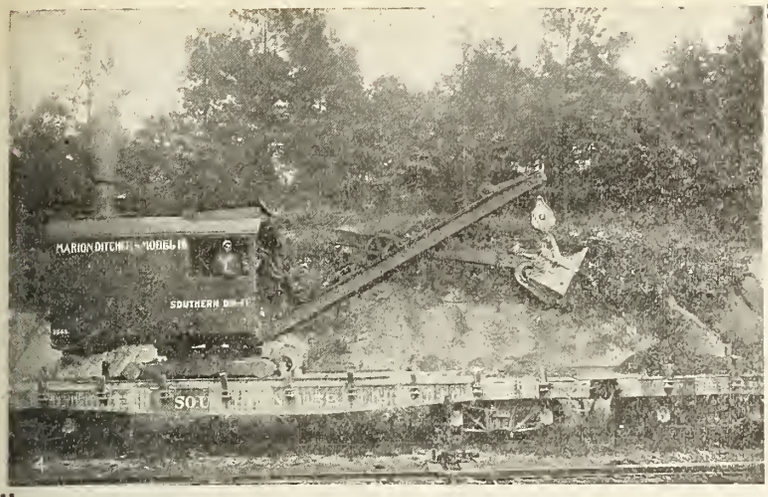

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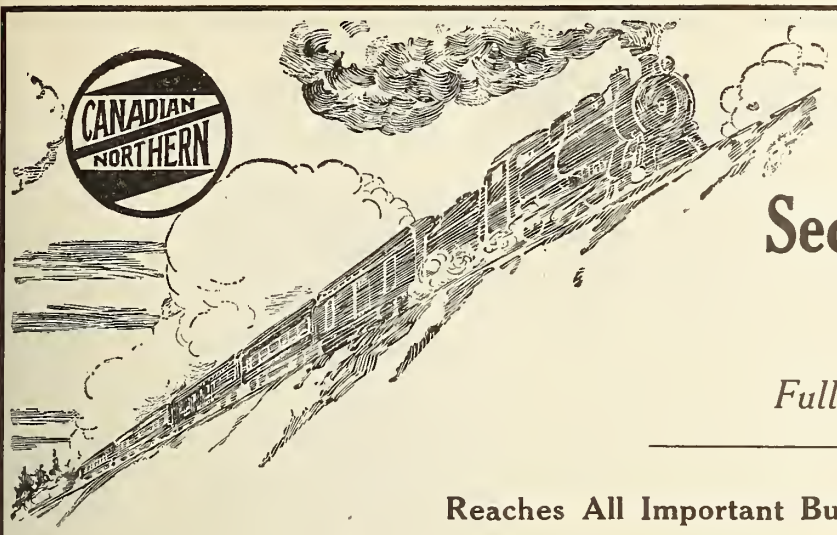

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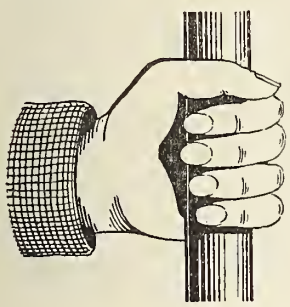

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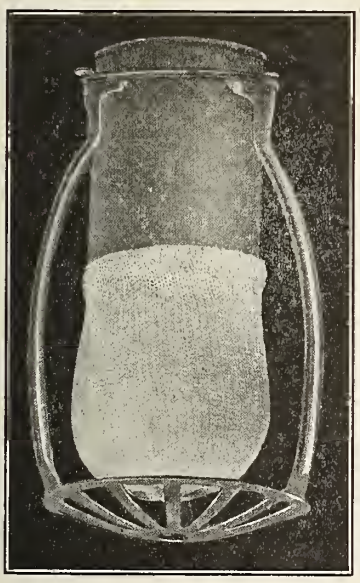

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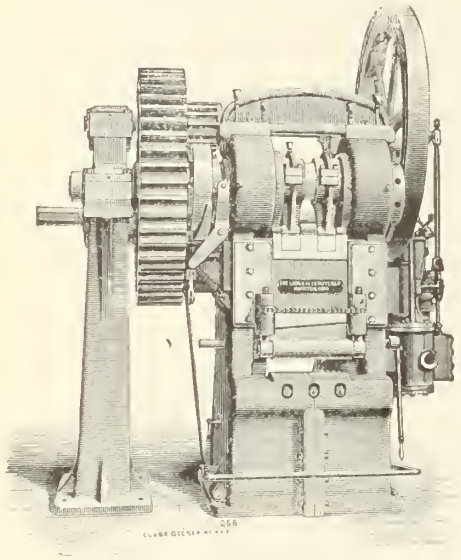

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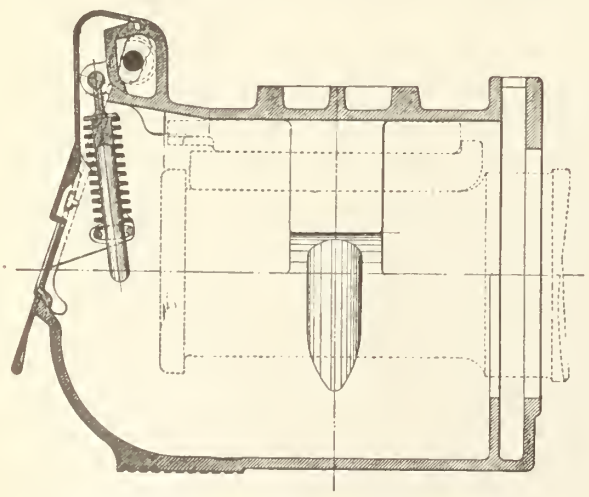

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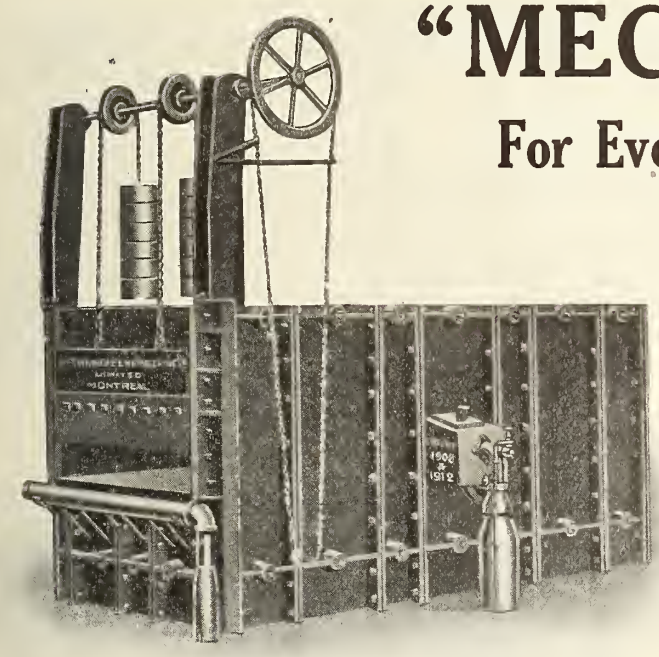

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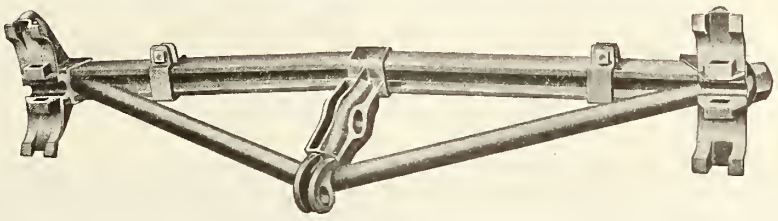

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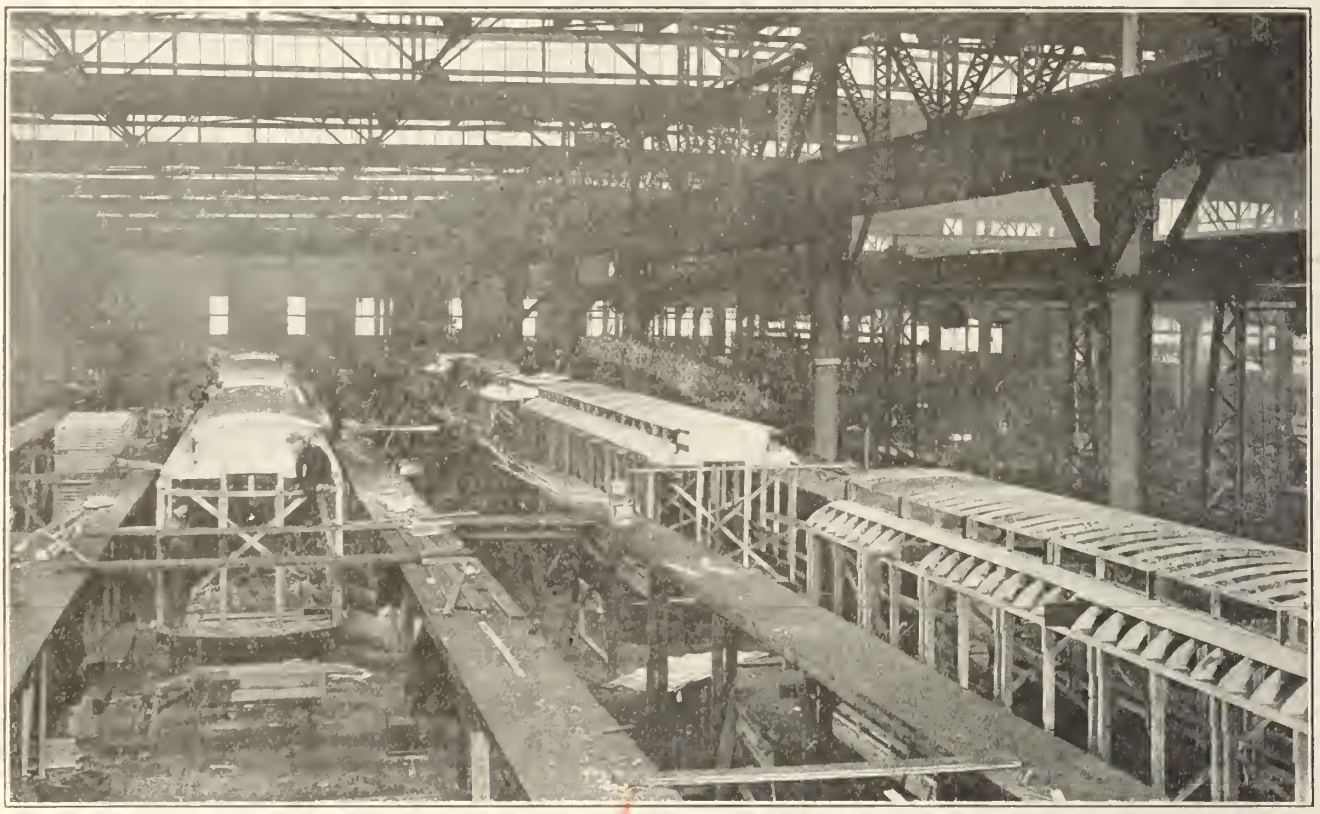

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Canadian Railway and Marine World

May, 1914.

The Location and Construction of the Canadian Northern Pacific Railway in British Columbia.

By J. V. Nimmo, B. Sc., M. Can. Soc. C. E., Division Engineer, C. N. P. R., Vancouver.

The route followed by the Pacific Section of the Canadian Northern Railway System in reaching tide water from the interior, is of remarkable interest, not only because it follows the best natural highway through the Pacific mountain system of North America, but because there appears to be no other instance where a great mountain region is traversed by a railway with such easy gradients and with such comparative economy of construction. To understand this situation it is necessary to consider briefly the main physical features of British Columbia.

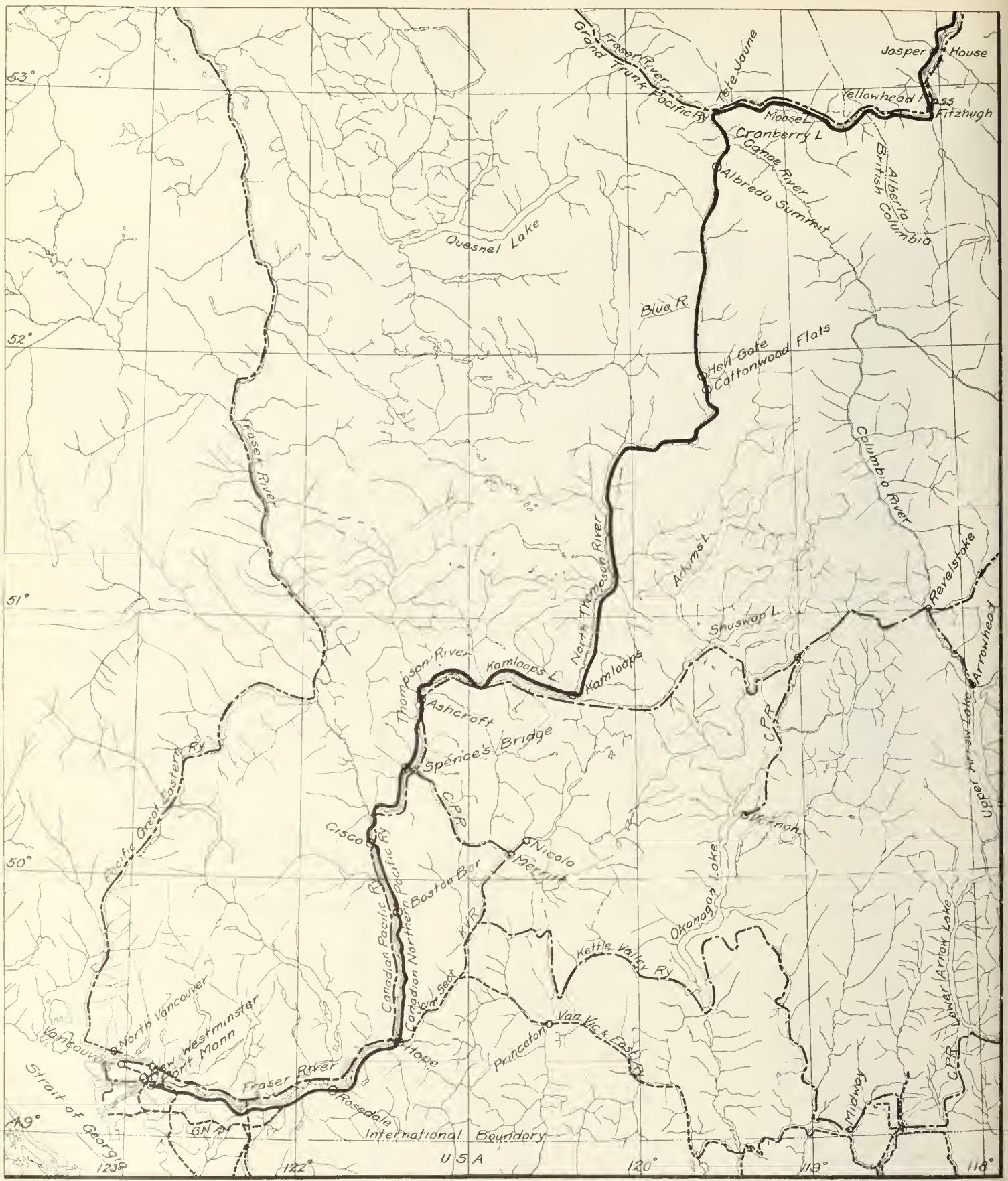
TOPOGRAPHY.—In broad outline the Canadian Cordillera may be divided into four provinces: (1) The Rocky Mountain system; (2) The Middle or Interior Range, including the Purcell, Selkirk, Columbia, Cariboo and Cassiar Mountains; (3) The belt of interior plateaus; (4 The Coastal System, including the Coast, the Cascade, and the Vancouver-Queen Charlotte Ranges. The first, third and fourth of these provinces extend, with but minor interruptions, through Yukon Territory and Alaska to the Behring Sea. The middle ranges are specially broad in southern British Columbia, but practically disappear about latitude 54 degrees, and reappear again between latitudes 56 and 62 as the Cassiar Range. Thus, briefly, we have two main mountain systems, one composed of the Rocky Mountain and Middle Range systems, the other the Coast Range, and between the two lies the belt of the interior plateaus. The striking feature of the first group of mountains which form the first and principal obstacles met with in approaching tide water from the prairies, is that they are subdivided by a number of great depressions running approximately northwest, and making a small angle with the main axis of the mountain ranges. The greatest of these depressions extends from Flathead Lake, in Montana, to the Yukon boundary, 990 miles. It is a relatively narrow but imposing trough, successively drained by the headwaters of most of the great rivers of the Canadian Cordillera. The larger streams flowing in the depression are:—The Kootenay, the Columbia, the Canoe, the Fraser, the Parsnip and Finlay (of the Peace River system), and the Kachika (of the Liard River system). Many of these leave the trough by transverse gorges cut in the adjacent mountains. All the mountains in Canada and in Montana lying to the northeastward of the trench have long been segregated as the Rocky Mountain system, and the trough has been named the Rocky Mountain trench. A second trench, about 220 miles long, cleaves the southeastern wall of the first, near Beavermouth, and runs southward. It is successively drained by the Beaver, Duncan and Kootenay Rivers, and for 74 miles is occupied by the Kootenay Lake. This trough rigorously separates the Purcell Mountain Range on the east, from the Selkirk Range on the west, and is called the Purcell trench. The Purcell Range is thus bounded on the east and west by the two trenches, and on the south by the loop of the Kootenay River in Montana and Idaho. A third depression extends from near latitude 52 degrees, where the Columbia River leaves the Rocky Mountain trench and flows south in a wide valley 310 miles long to the Columbia lava fields of Washington State, passing through the Arrow Lakes on its way. This depression is sometimes referred to as the Selkirk Valley. East of the Selkirk Valley, and west of the two master trenches, is the Selkirk Mountain system, which, like the Rocky Mountain and Purcell systems, extends into the United States. The rugged mountains to the west of the Selkirk Valley have been grouped under the name of the Columbia Mountain system. Between the 54th and 56th parallels the western wall of the main Rocky Mountain trench is much less prominent than it is either to the south or the north, where it is formed by the Cassiar Mountain Range, so much so that between these two parallels the interior plateaus might be said to extend right up to the trench. The various ranges to the west of the Rocky Mountain trench and south of the 52nd parallel concentrate into one north of the Selkirk Valley. The single range has its narrowest width and lowest pass at Albreda Lake, almost opposite the Yellowhead Pass.

In so far as this generation is concerned we may consider latitude 56 degrees as the northernmost limit of the territory across which a transcontinental railway would be constructed. Between this latitude and the International Boundary there are seven main passes through the Rocky Mountain chain, as follows:—The Crows Nest, at an elevation of 4,449 ft.; the Kicking Horse, at an elevation of 5,200 ft.; the Howse, at an elevation of 4,500 ft.; the Athabasca, at an elevation of 5,710 ft.; the Yellowhead, at an elevation of 3,718 ft.; the Smoky River, at an elevation of 5,400 ft.; the Pine, at an elevation of 2,850 ft.

The Crows Nest and the Kicking Horse passes have been taken by the C.P.R. They cross the Rocky Mountain and Selkirk groups of mountains at its widest and lead to routes which inevitably cut square across the great trenches enumerated above, and pass over intervening summits of magnitude. There is only one suitable route open to them across the Cascade and Coast Ranges, viz., the Fraser River Valley, to enter which involves, not only a circuitous route, but heavy gradients. The Howse offers no suitable approach from the east, and leads to the same difficulties as the Kicking Horse. The Athabasca and the Smoky are too high, and the approach to them from the west and the east is too rapid for easy grades. The Pine is good, but the geographical situation places it at a disadvantage as compared with the Yellowhead, which alone complies with the necessary requirements of:—Easy approach from the west and the east, access to an easy pass through the Cascades, and to a first class deep water harbor.

This leads to the consideration of the approach to the Pacific through the Cascades. The main alternatives are by the way of:—The Fraser River to Burrard Inlet; Nomathco to Bute Inlet; the Bella Coola to the North Bentinck Arm; the Salmon River to Dean Inlet; the Kemano River to Gardner Inlet; the Skeena River to Prince Rupert. Of these only the first and last are routes that pass through major breaches in the Cascade Range, and the only ones that do not offer gradients somewhere in their course which would be a serious obstacle to transcontinental traffic. The Coast Range is less mountainous towards the north than it is in the south, hence, although the Skeena in reality is not as great a river as the Fraser, yet it is so relatively to the country through which it passes, and provides almost an equally suitable approach to the Pacific. The second condition of the problem, viz., the satisfactory connection between the Rocky Mountain pass and these breaks in the Cascades, is wonderfully fulfilled by both routes. Instead of the great trenches being obstacles, as is the case in the southern routes, they now form part of the connecting link. The northern route through the Skeena follows the Rocky Mountain trench until the western wall of the latter comes to an end, whence there is an easy way across the great interior plateau by the Nechako and Buckley Rivers. For the southern route there is the providential opening through the Columbia Mountain system at the Albreda summit, from which flows a branch of the Thompson, the main tributary to the Fraser. Here is another illustration of how railways must, as far as possible, follow nature's highways, the rivers. Seldom, however, does nature put her great waterways in as suitable a position for the use of railway locators as she has done in this case. Of these two routes the northern is followed by the Grand Trunk Pacific, and the southern by the Canadian Northern Pacific.

THE GEOLOGICAL HISTORY of the Canadian Cordilleras is yet largely a matter of mystery. The formation is chiefly sedimentary, and there is little evidence of volcanic action. There appear to have been several sedimentary periods alternating with periods of upheaval; and the evidence tends to show that the sediment was from detritus from mountains to the northeast. Probably the Rocky Mountain Range is younger than the Selkirks. There is no doubt that the region of interior plateaus was covered during the Pleistocene period by the cordilleran ice cap. With the waning of this ice cap it gradually gave place to alpine, cirque and valley glaciers, which slowly retreated until the time of maximum extension of the Keewatin ice sheet on the east, when the second period of valley glaciation took place. These glacial conditions, followed by eons of disintegration and slow (and probably discontinuous) land upheaval, appear to have modified the original form of the Cordilleras to their present condition. By what exact process the wonderful rift was made, which is followed by the C.N.P.R. through these mountains, can only be determined, if ever, by very much more geological study



Canadian Northern Pacific ——— Grand Trunk Pacific & Pacific Great Eastern —·—·—·—·—
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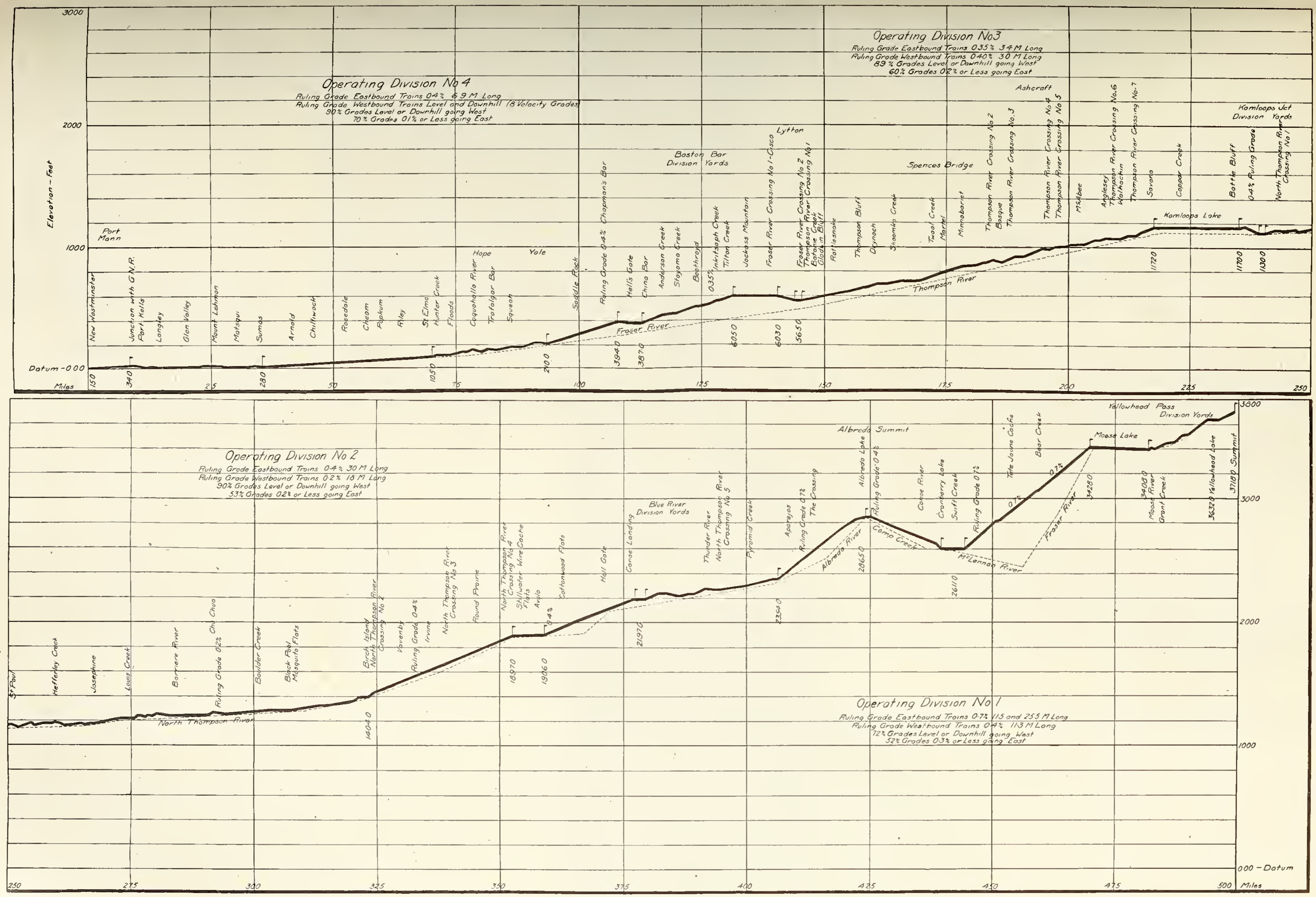
Route of the Canadian Northern Pacific Railway in British Columbia.

than has been given up to the present; but whatever the cause, the result is unique and stupendous. The route followed by the C.N.P.R. may be taken for geological purposes in the following divisions—1, From Jasper House to Blue River. This section traverses the Rocky and Selkirk Mountains, and for part of the distance lies in the Rocky Mountain trench; 2, from Blue River to Ashcroft. This section is through the belt of the interior plateaus; 3, from Ashcroft to Rosedale. Traversing the Coast Range; 4, the Fraser Delta from Rosedale to Vancouver. The formation through the first of these sections consists of sandstone,



Profile Showing Grades of Main Line Canadian Northern Pacific Railway, New Westminster Bridge to Yellowhead Pass.

limestone, argillaceous and siliceous shales and quartzites, mica, schist, some granite and gneiss, a great deal of gravel and boulders and some glacial clay. The rock in the second section is composed largely of shales, conglomerate sandstone, limestone, quartzite, etc., but the predominating features are the gravel and boulder formations and glacial clay. This latter forms the principal material met from the west end of Kamloops Lake to Spences Bridge. The third section may be subdivided into:—1, Spences Bridge to Boston Bar. The most striking feature of this territory is the predominating occurrence of gravel and boulders. The slope of the valley for miles consists of unknown depths of this material, sometimes running up the mountain side for several thousand feet. The rock, of which a good deal is encountered, consists chiefly of shale, sandstone and limestone. 2, Boston Bar to Hope. This comprises the Fraser Canyon proper, and is almost entirely in rock, which consists of grano-dyar-

ite, sandstone, limestone and shale. 3, Hope to Rosedale. The railway here passes on the benches consisting largely of gravel and sand. 4, The Fraser Delta. This is alluvial formation.

LOCATION.—For the consideration of the location in greater detail, the route will be followed in a general direction of east to west. The principal features of the route have long been well known, by reason of the very able and exhaustive surveys made under the direction of Sir Sandford Fleming from 1872 to 1880, both reconnaissance and in detail, on behalf of the Dominion Government, in order to find the best route for a transcontinental railway, which had been promised on British Columbia entering Confederation. One cannot pass this subject without expressing one's admiration for the ability and energy displayed by Sir Sandford and his able assistants, as is evidenced by the monumental reports on their work, which were published by the Dominion Government, and to which the author owes much of the information in the early part of this paper. Amongst others, an instrumental survey of the route now followed by the Canadian Northern was made, and Sir Sandford recommended that route to the Government. Why this advice was disregarded, and the C.P.R., the outcome of the Confederation policy, was built over the Kicking Horse Pass will, no doubt, be disclosed some day. But however surprising such a choice may appear to the engineer, there can be no doubt that this selection has been of great benefit to the country as a whole, inasmuch as it has opened up the southern portion of British Columbia more efficiently and earlier than otherwise could have been done. Moreover, this choice left open to its younger, and consequently less vigorous rival, a route without which the latter could hardly have become a transcontinental railway as soon as it now promises to be; while the broad back of the C.P.R. is well able to carry, and its financial strength to surmount, the difficulties which the Kicking Horse route is responsible for.

The approach to the Yellowhead Pass from the east is gradual and easy; and the crux of the whole problem lies in the part between the Yellowhead and the Albreda summit, which is a water shed for the Columbia River system on one side, and the Thompson River system (that is, the Fraser River system) on the other. Hence the route leaves the Fraser only to eventually return to it again, but a glance at the map shows the gain that this gives in distance. The water flowing north from the Albreda summit is called Camp Creek, and empties into the Canoe River, a tributary of the Columbia, at a point only about four miles south of Cranberry Lake, the source of the McLennan River, a tributary of the Fraser. The divide between Cranberry Lake and Canoe River, that is, the watershed between the Fraser and the Columbia system, is only a few feet high; hence McLennan Creek, Cranberry Lake and Camp Creek form one continuous wide valley. To put it in another way:—Cranberry Lake lies in the bottom of an enormous flat bottomed bowl, which is broken, as it were, into four quarters, by the Canoe River east and west, and McLennan Creek and Camp Creek, north and south. Hence we see that the Rocky Mountain trench, here drained by the Canoe River, Cranberry Lake, McLennan Creek and the Fraser River, is the key to the situation. From the Yellowhead, the Rocky Mountain Pass and from the Albreda, the Selkirk Mountain Pass, wide, gently falling valleys connect with the trench; and Cranberry Lake Flat, which must be crossed, is the governing feature of the connection. From the Yellowhead summit to Cranberry Lake, mile 439, there is a fall of about 1,100 ft. in 60 miles. That portion of this distance, however, which governs the grade, lies between Moose Lake, mile 473, and Cranberry Lake Flats, mile 439. From Moose Lake to the east end of Cranberry Lake Flats is 25 miles and the total fall is 816 ft. This gives a continuous seven tenths grade, when due compensation is made for curvature and passing tracks, and was considered to be the economic grade for that country Thus was fixed the ruling grade for east bound traffic for the operating division whose eastern extremity is at the Yellow head Lake, mile 495, and the western extremity at Blue River Flat, mile 384. From Cranberry Lake the line rises with a four tenths compensated grade to Albreda Lake, mile 425, at an elevation of 2,854 ft. Since the Albreda falls at the rate of 43 ft. to the mile, a supported grade going south was inevitable, but for the sake of economy in construction it was desirable to reach the North Thompson Valley bottom as soon as possible, hence a seven tenths grade was introduced, striking the valley bottom at mile 406, or 10 miles below the mouth of the Albreda. From this point to Hell's Gate, mile 372, the Thompson falls 7 ft. to the mile and the line follows the river bottom. Thus the first operating division, ending at Blue River, has long ruling grades compensated for curvature and passing tracks, of seven tenths for eastbound, and four tenths for westbound traffic. From Hell's Gate, mile 372, to Cottonwood Flats, mile 367, the Thompson falls at the rate of 37 ft. to the mile, while the railway is again supported, dropping with a continuous four tenths compensated grade. At mile 367 it once more strikes the river bottom, which it follows to mile 353 along the Stillwater Flats, the river falling at the rate of 1.4 ft. to the mile. From the west end of Stillwater Flats to Birch Island, mile 322, a four tenths supported and compensated grade is again followed, as the river falls over the first part this distance at the rate of 18½ ft. to the mile. From Birch Island to Kamloops, mile 243, the river, whose average fall is only 3 ft. to the mile, is followed closely. From the Blue River, mile 384, to Kamloops Jct., mile 243, the starting point of the Vernon branch, is the second operating division, the eastbound grade being governed by the long supported four tenths grade referred to before. Against west bound traffic the ruling grade is two tenths per cent., less than two miles long. From the west end of Kamloops Lake, mile 218, to Lytton, mile 145, the main Thompson River is followed, the average fall being 9 ft. per mile. From Lytton, mile 145, to Hope, mile 77, the Fraser River has an average fall of 5½ ft., and from Hope to Rosedale, mile 47, 3 ft. per mile. The third operating division is from Kamloops Jct. to Boston Bar, mile 119, over which distance there are short ruling grades against eastbound traffic, of four tenths compensated for curvature. Against westbound traffic there is a four tenths grade compensated for curvature, about three miles long, at the east end of Kamloops Lake. This grade, however, if traffic demands it, can be replaced without much difficulty, by an easier one. The true ruling grade is that between the two crossings of the Fraser River south of Lytton, for this is a fixture. It is three tenths compensated and 3½ miles long. The fourth operating division is from Boston Bar to Port Mann. Against westbound traffic there are virtually no grades. While the ruling grade eastbound is fourth tenths compensated, 1.3 miles long. In the 500 miles from

Tilton Creek Concrete Culvert, Mile 130.5, Before Fill Had Been Made.

Cisco Bridge Over Fraser River, Near Lytton, Mile 140.

FROM	TO	Miles	Eastbound trains		Westbound trains	
			Ruling grades	Other grades	Ruling grades	Other grades
Port Mann	Boston Bar	119	.40%-6.9 Miles	.70% .1% or less	8 vel. grades level and down hill	90% level or down hill
Boston Bar	Kamloops Jct.	124	.35%-3.4 "	.60% .2% " "	.40%-3 miles	80% " " " "
Kamloops Jct.	Blue River	141	.4 %-30 "	.53% .2% " "	.2%-1.8 (Vel.)	90% " " " "
Blue River	Yellow Head	111	.7%-25.5 "	.52% .3% " "	.4%-11.3 "	72% " " " "

the Yellowhead summit to Port Mann there are only 22.3 miles of adverse grades, or 4½% of the total distance. The maximum curvature throughout is eight degrees, and this has been used as sparingly as possible.

There were no particular engineering difficulties encountered in the surveys but plenty of hard work, and even danger. The procedure was that customarily in vogue. The crux of the problem lay between Birch Island and the Yellowhead Pass. Even here the main lines are well defiled, and the alternatives few, the paramount difficulty being one of transportation and supplies. The country west of the Albreda summit was, at the time of the surveys, most readily accessible from Kamloops. This involved a pack train about 100 miles long. The physical difficulties in keeping a survey party equipped with supplies, quite apart from the strenuous work of the survey itself, makes this piece of location a most praiseworthy one. During the winter months communication was entirely cut off, except for the monthly trips of the mailman. The records of these trips are a story in themselves. The difficulties, however, were not over on the disappearance of the snow, for between that time and the rise of the rivers, which during high water are un fordable and covered large portions of the trail, there was only sufficient time for one trip of the pack train, and continuous packing could only be carried on after the floods had subsided and ceased in the autumn. Much credit is due to those who faced and

Gladwin Bluff, Above Lytton, Mile 151.

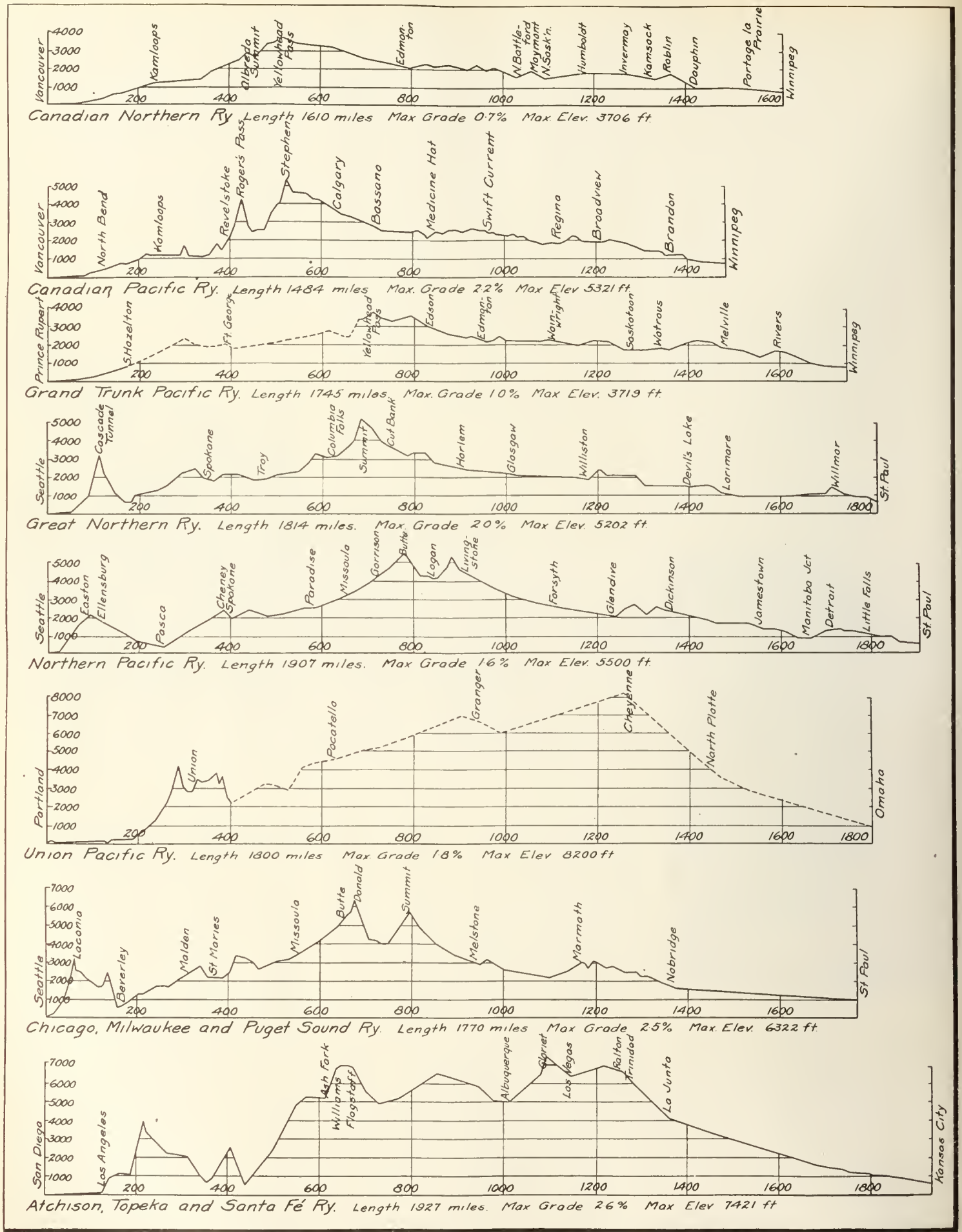
surmounted these difficulties. The first survey parties were sent out in May, 1909; construction was started from Port Mann to Hope in July, 1910; from Hope to Kamloops in Aug., 1911; from Kamloops to Birch Island in Oct., 1911; from Birch Island to the Yellowhead Pass in May, 1912; from the Yellowhead to Albreda in Aug., 1912, and from Blue River to the Albreda in May, 1913. The line should be open for operation by next autumn.

CONSTRUCTION.—We will now reverse our direction, and consider ourselves as going from west to east. For a railway passing through one of the main mountain regions of the world the work is, on the whole, extremely light. From Port Mann to Rosedale, mile 47, the grading is largely prairie work, although spurs from the main mountain range give rise to heavier work at intervals. From Rosedale to Hope, mile 77, the work becomes heavier as the valley narrows, and still more so from Hope to Yale, mile 91; but so far there is nothing calling for special comment. At Yale the canyon proper is entered, and the heaviest work on the whole railway is encountered, the heaviest mile costing $326,300, without fence, telegraph or track. From Yale to Boston Bar, 26 miles, the rock work is extremely heavy, and there are 15 rock tunnels, aggregating 8,321 ft. The rock is mostly granite, and bluff follows bluff, all with almost perpendicular faces. A great deal of this rock was shot into the river, but a surprising number of fills were successfully constructed. As the rock was largely in huge masses, partly owing to its rough nature, and partly owing to the fact that it was often separated into large blocks by natural seams, these fills are well calculated to stand even the Fraser floods. This piece of line was perhaps the most difficult one to locate and cross section. From Boston Bar eastward, gravel is frequently encountered; indeed, from mile 128 to Savona, mile 218, there is almost more steam shovel work than anything else. The heaviest yardage is in the neighborhood of Tilton Creek, mile 130. Here cuttings aggregating 414,000 cu. yds., were led to one large fill. Jackass Mountain, extending from mile 134 to 134.5, consists of massive conglomerate and shale, the yardage for this half mile was 182,000 cu. yds., with two tunnels aggregating 548 ft. One of these tunnels was, however, carried out in an enormous slide in the hill side on the night of Nov. 18, 1912, which followed a period of heavy rain about six weeks after the tunnel was finished. The formation through which the tunnel was driven was very broken. A large black shale seam about 2 ft. wide, which made an angle of about 20 degrees with the vertical, and 30 degrees with the centre line of the tunnel, crossed the line of the tunnel about one third way through from the east end, separating the country rock on the upside from an overlying rock formation on the other. This overlying material was very broken, and interspersed with soft clay. It seemed to be debris from the mountain side above, and bore no relation to the country rock. Whether the hill slid on the shale seam, or whether the clay, swollen by the heavy rains, exerted excessive pressure on the tunnel timbers, causing them to collapse, thus releasing the toe of the hill, it is impossible to say. The whole slide had been removed, and the hill side dressed to an apparently safe slope, when three weeks later, on Aug. 25, 1913, another slide of considerable magnitude occurred. This was in turn removed, and the slope redressed, leaving now an open cutting, probably safer than any other part of the mountain.

The line crosses the Fraser at Cisco to follow the north or left hand bank, thus avoiding the C.P.R. It recrosses again at Lytton, and three quarters of a mile further on crosses the mouth of the Thompson River, since it was considered less costly to build these two crossings than one large one across the Fraser, above the mouth of the Thompson. A piece of heavy work is met with at Gladwin's Bluffs, mile 149 to 151. This is a contact zone between the Coast Range Batholith and the Paleozoic Schiztose rocks, the whole traversed by many Tertiary dykes and Chonolithic intrusions. It is a particularly awkward place on which to locate. The quantities for this two miles of work are as follows:—478,946 cu. yds. of excavation and 990 lin. ft. of tunnel. The average cost per mile is $222,650, without track, telegraph or fence. Just beyond the Gladwin Bluffs the line is constructed along the top of a rock cliff and at the foot of immense gravel slopes, which rise at an angle of between 1¼ and 1½ to 1 to a height of some 700 ft. This gravel, which was well cemented, was excavated by the hydraulic method; excess roadbed width being allowed, depending on the height of the face. The faces have stood splendidly, although the debris naturally accumulates at the foot of the slope, but not to a greater extent than such maintenance forces as must necessarily be employed by a railway through such mountanous country, will be able to cope with. Bad bluffs were encountered at Thompson and Drynoch. The rock

Grading Chutes, Mile 30 West of Yellowhead Pass.

at Thompson was even more broken than that at Gladwin, and a huge slide has occurred which is still being removed. At mile 162 there is a heavy clay slide, which is still moving, although 350,000 cu. yds. have been removed to date (Feb. 3). There is no evidence of water seepage, and there is nothing to do but to keep on excavating until the material reaches its angle of repose. Drynoch Bluff, mile 163, was a most dangerous place on which to locate, and offered the usual difficulties in construction. It has three short tunnels and the open slope is very high, surmounted by a good deal of gravel and other debris. Crib traps have been installed at various points on this slope, but here, as in other places, constant watch must be kept by the maintenance organization. At mile 184 the line crosses on to the C.P.R. side of the Thompson River and recrosses at mile 188.5, passing direct from the bridge into a tunnel, 1,319 ft. long, in the famous Black Canyon. This formation is a black cretaceous shale and sandstone. Just east of this tunnel there is a slide similar to the one on the C.P.R. side, west of its Black Canyon tunnel. A spring, which made its appearance about one third of the way down the slide, was tapped by a water tunnel and led to an adjacent gully. At every high water, however, the slide moves and has moved for some 120 ft. since the records were first taken. It is thought that this is due partly to saturation from the melting snow, and partly from the action of the high water in the river, although what



Comparative Profiles of Railways Crossing the Western Mountain Ranges.

happens exactly is not yet understood. Borings showed 26 ft. of clay and then gravel, but they were not taken down through the gravel.

Some two miles further east the grade was first constructed at the foot of the bluff, partly in cut and partly in fill, the latter standing well until the flood of 1913. An extensive crib is now being constructed at this place. From Ashcroft, mile 194, to Savona, mile 218, it is almost all steam shovel work in glacial clay. Rock work is again encountered along Kamloops Lake, including a tunnel at Battle Bluffs, 2,835 ft. long. At mile 244, the line crosses to the east bank of the North Thompson. Immediately east of the bridge is the Kamloops division yard. Between Lytton and Kamloops there are three crossings and recrossings of the Thompson River, to avoid heavy clay bluffs, the work on the C.P.R. side at these places being generally very light. From Kamloops Jct., mile 243, to Birch Island, mile 324, the work is easy on the whole, although occasionally the line hits a rock slope with some severity. From Birch Island to the third crossing of the Thompson River at mile 339 there is heavy steam shovel work along the supported grade. From mile 330 to the fourth crossing at mile 351, although the work was largely steam shovel material, it was entirely carried out by hand, owing to the difficulty of getting in machinery. There is little to call for comment from here on, except to refer to the extraordinarily light work across Stillwater Flats, until the supported grade is reached at mile 360 to 376 (Canoe Landing). This is the heaviest portion of the North Thompson River work, particularly at Hell's Gate, where the river passes through a minature Fraser canyon, involving heavy rock cutting and two small tunnels. From mile 376 to the next supported grade at mile 406, the work is extraordinarily light for a mountain railway. From mile 406 to 417 extends a region of heavy sand, gravel and clay cuttings and tunnels, one of these

Mullen Bluff, Fraser Canyon, Showing Tunnel 6, Mile 98.31.

latter being 1,000 ft. long. All this work is done by hand, as it is not practicable to take in machinery. From mile 417 to the Albreda Summit, the work is again very light, indeed at the summit itself it would be cheap for prairie country. The two crossings and recrossings of the North Thompson are to avoid heavy work, and to get better alignment. The first two of these crossings are 80 ft. deck plate girders, supported on pile piers, consisting of a group of 32 piles, capped by a three course grillage of 12 by 12 timbers. This in turn is topped by a 1 in. steel plate, bored to receive the anchor bolts from the girder bearings. Placed about the piling is a timber crib pointed on the up stream and square on the other end. These cribs are not attached to the piling, but form a sleeve, and are sufficiently free of the piling to permit their sinking, as they are built up from the water surface. The tops are completed to about 5 ft. above high water and then are rock filled. The third crossing is a temporary pile bridge below the permanent crossing, which will be of concrete piers. The other two crossings are low and short, and are over wooden pile bridges. From mile 425 to Canoe River crossing at mile 436 the rock work is fairly heavy, although there are a good many gravel cuttings also. Canoe River is crossed on a steel viaduct. From this point to mile 445 the work would be light even on the prairies. No really heavy work is encountered until the Fraser Valley is entered at mile 453. From this point the Grand Trunk Pacific is paralleled and the two roads are never more than a few hundred yards apart. From mile 456 to Moose Lake, mile 472, there are some very heavy rock cuttings. Difficulties were particularly great for the last ten of these miles, owing to the fact that the grade had to be constructed immediately above the G.T.P.R., then in operation. The two lines run on the north shore of Moose Lake, side by side as double track. From Moose Lake the G.T.P.R. falls with a 1%, and the C. N.R. with a seven tenths compensated grade. Hence the two lines rapidly diverge in elevation but remain very close in alignment. All mucking over this portion from the C.N.R. had to be carried across the

Hells Gate, Fraser Canyon, Mile 110.6.

G.T.P.R. on trestles and shot direct into the Fraser River. Six of these trestles and chutes were constructed. From Moose Lake to Yellowhead the work calls for no special comment, as it is light, and the valley wide and uniform enough to provide an easy route for both railways.

There is not much in this work of interest to railway engineers, except the bridging; the steam shovel work in gravel and clay, and the resulting slopes; the rock blasting; the classification. As the steel bridges were designed and entirely under the supervision of Waddell and Harrington, consulting engineers, the author does not propose to make any reference to them, beyond showing some views in the hope that a paper will be read some day before the Canadian Society of Civil Engineers by a member of Waddell and Harrington's firm.

In regard to the steam shovel work in gravel and clay, and the resulting slopes, no one would deny the value of steam shovels, or their necessity, if such work as is now being described, is to be carried on economically and expeditiously. At the same time the engineer would be delighted to dispense with them, were that possible, unless the material was being excavated to a final angle of repose. In some cases this was done, but speaking generally such a plan is a counsel of perfection, and not economically practicable. The difference in yardage between 1 to 1 slopes and 1½ to 1 slopes, on side hills that extend upwards for hundreds of feet, is self evident. Moreover, in most gravel cuttings, a 1 to 1 slope, if not permanent, would give very little trouble for a number of years, when it could be economically handled by steam shovels with mainline equipment. But when 1 to 1 quantities are dug by steam shovel and the slopes left standing nearly plumb, it means that the company has frequently to face comparatively heavy further excavation expenditure after the line is opened. Sometimes a portion of the slopes

in steam shovel work was lightened by having the top hand sloped, but in the more cemented gravels and harder clays, the slope was left as dug by the steam shovels. Undoubtedly, all things being equal, unless the quantities to be excavated in the first instance are those contained by slopes at the angle of repose, hand slope work is infinitely more satisfactory than steam shovel work. Most of the gravel and clay lies in the dry belt, otherwise it may be supposed there would be little left. Hence the conditions on this construction were unusually favorable for the safety of undressed slopes.

One of the main difficulties the railway engineer encounters is to prevent the contractor from using too much powder. Such work as is here described is usually carried out by stationmen working under sub or sub-sub contractors of the main contracting company. The stationman, who seems to live in a state of perpetual hope, is strongly tempted to over shoot, with a view to breaking up his rock as small as possible, and to save handling, where, as was largely the case on this work, the material was wasted direct into the river, whose course the railway is following. That this may result in over-break the stationman is well aware, but his faith and hope in the engineer's charity will induce him to chance the disallowing of the overbreak. If allowed, he stands to gain heavily. Besides there are seams, which with a little flattery and talk about the experience of the engineer, etc., etc., he may hope to pass off as the cause of the overbreak. Indeed the engineer will often be in a quandary to know whether the rock, even though lightly shot, would not have broken to a clearly indicated seam. The sub contractor has little inducement to check the stationman from overshooting, for the more powder the stationman uses, the more profit the sub contractor stands to make. If no more than the estimated yardage is paid for, the sub contractor makes at least as much profit as he set out to make, and if over-break is included he is that much to the good. Thus with blarney and bluster pressure is brought to bear on the engineer on all sides, which it is frequently very hard to resist, especially by the younger members of the profession. The Canadian Society of Civil Engineers excludes in its Standard Specifications the use of powder in large blasts in seams, drifts, shafts and coyotte holes. This again is merely a counsel of perfection, nor would its strict enforcement tend to economy. The remedy must always be in the judgment and experience of the engineer in charge, who should make a point of at once warning the contractor against the results of heavy shooting, as soon as he sees any signs of such a course being proceeded with, and hold him strictly to account if his warnings and instructions are neglected. From the experience of this work the author is strengthened in his convictions that more than from 1 lb to 1¼ lbs. of explosive to a cubic yard of excavation is needed only in very rare cases; and in ordinary sandstone and limestone, if at all seamed, ¾ lb. per yard would generally be sufficient. For shales ½ lb. or less is plenty.

From Port Mann to Hope, and from Kamloops to the Yellowhead Pass, four classifications were used in accordance with the C.N.R. standards, as to which no special comment is necessary, except as to the definition of solid rock, which is the same through the whole work. From Hope to Kamloops there are only two classifications,

Deck Girder Bridge, With Lift Span, Over North Thompson River, Near Kamloops.

which read as follows:—"All stones or boulders found in excavation measuring more than 27 cu. ft., and all solid quarry stone requiring blasting in order to remove it, shall be termed 'solid rock.'" "All other materials other than solid rock as described above, shall be termed 'all other materials,' and paid for at the schedule rate for 'all other materials.'" The solid rock definition is a great deal more definite than most, and leaves very little room for the questioning of engineers' decisions. It may be thought at first sight that this solid rock definition and the two material classifications would remove many of the classification difficulties, which all engineers have to face. In practice, however, even through country where as in this case the material can be broadly classed as rock and gravel or clay, grades of rock are met with, which although strictly coming under the "other material" classification, must in equity, be allowed for in part as solid rock, and one is again left with the conclusion that no specification can be drawn up which does not require to be interpreted on the broad grounds of professional intelligence and common sense.

The foregoing paper was read before the Canadian Society of Civil Engineers, Vancouver branch, recently. We are indebted to T. H. White, M. Can. Soc. C.E., Chief Engineer, C.N.P.R., for the diagrammatic profiles accompanying the paper, and for the photograph of the Kamloops bridge; also to the author of the paper, Mr. Nimmo, for the photographs from which the other illustrations have been made.

Comparitive Profiles. — Following are figures relating to the comparative diagrammatic profiles given of eight transcontinental railways:—

	Maximum Grade.	Maximum Elevation.	Length Miles.
Canadian Northern .	0.7%	3,706 ft.	1,610
Canadian Pacific ...	2.2%	5,321 ft.	1,484
Grand Trunk Pacific.	1.0%	3,719 ft.	1,745
Great Northern	2.0%	5,202 ft.	1,814
Northern Pacific ...	1.6%	5,500 ft.	1,907
Union Pacific	1.8%	8,200 ft.	1,800
Chicago, Milwaukee and Puget Sound..	2.5%	6,322 ft.	1,770
Atchison, Topeka and Santa Fe	2.6%	7,421 ft.	1,927

Tilton Creek Culvert. — Mr. Nimmo has given us the following data about this culvert:—Height from grade to top of culvert at the junction with the tunnel, 137 ft. The culvert is 21 ft. 7 ins. wide, 19¾ ft. high, giving an opening of 312 sq. ft. The tunnel was taken out a foot wider than the culvert to allow for future lining. The length of tunnel is 300 lin. ft., and of the culvert, 226 ft. There are 3,150 cu. yds. concrete in culvert, and 90 cu. yds. in tunnel lining. The total cost of the water tunnel and culvert was about $70,000.

Kamloops Bridge.—This structure, over the North Thompson River at Kamloops, is a deck girder bridge, 1,209 ft. long, and has a deck girder lift span 93 ft. long. There are 12 fixed spans, also of 93 ft. length. Approaches at both ends of the bridge, of timber trestle construction, total about 1,100 ft. The lift span weighs 118 tons, and is fully counterweighted. The sixteen 1¼ in. lifting cables are equalized in the attachment to the span. Centring castings provide for keeping the span in proper alignment as it comes down to bearing, and also take the longitudinal braking thrust. The lift of the span is 53 ft., giving a 55 ft. clearance above high water. The motor is capable of raising the span in 100 seconds. The lifting power is a gasoline engine, which, with all the machinery, except the operator's levers, is located below the deck, at the middle. Limit switches coming into operation near the ends of travel of the span control the igniter circuit of the engine.

The bridge was designed by Waddell and Harrington, of Kansas City, Mo. The lift span is built with the arrangement and details used by them in their various lift bridges built in recent years.

Imperial Service Medals for long service have been awarded to Canadian Government Railways employes, as follows:—J. Anderson, foreman, Moncton, N.B.; T. Bowes, shed foreman, Halifax, N.S.; J. Enman, station master, Summerside, P.E.I.; F. E. Harrington, ticket agent, St. John, N. B.; J. W. Henderson, conductor, Moncton, N.B.; R. Howell, machine man, Moncton, N.B.; J. Kennedy, machinist, Moncton, N. B.; W. M. Kingston, baggage master, St. John, N.B.; D. LeBlanc, track man, Moncton, N.B.; D. H. Lockhart, fitter, Moncton, N.B.; T. McCurdy, section foreman, New Mills, N.B.; D. McKenzie, fitter, Sydney, N.S.; A. McKim, baggage man, Moncton, N.B.; J. A. McMullan, track foreman, Pugwash, N.S.; J. Martin, station master, St. Fabien, N.B.; D. Montgomery, station agent, Georgetown, P.E.I.; F. Morin, section foreman; G. Murray, foreman carpenter, Truro. N.S.; P. Murray, spring maker, Moncton, N.B.; A. Ormiston, general foreman, Truro, N.S.; J. Patterson, track master, Campbellton, N.B.; A. Patterson, seamstress, Halifax, N.S.; J. Royer, baggage master, Campbellton, N.B.; J. Scott, tank man, Alton, N. S.; G. Souci, conductor, Riviere du Loup, Que.; W. Spear, freight checker, Sussex, N. B.; D. Stewart, repairer, Mulgrave, N.S.; J. Stewart, repairer, Mulgrave, N.S.; J. Stratton, engine man, Moncton, N.B.; J. Wood, section man, Kent Jct., N.B.; and C. Wood, section man, Kent Jct., N.B.

The preservative value of salt is said to have been demonstrated in the Great Salt Lake district of Utah, where, in the replacement of a timber trestle the engineers found the piles perfectly sound after 43 years' service. The same action is not met with in ocean waters, as the latter are not sufficiently strong, the Great Salt Lake water being practically a saturate solution.

Mikado Locomotives for the Canadian Pacific Railway.

By T. C. Chown, Leading Draughtsman, Motive Power Department, Canadian Pacific Railway.

During the autumn of 1913, the C. P. R. had built by the Montreal Locomotive Works, 75 mikado locomotives, having a tractive effort of 42,000 lbs., 23½ by 32 in. cylinders, 180 lbs. boiler pressure, and of a total weight in working order of 258,000 lbs. They are very similar in design to the 20 designed and built by the C. P. R. in its Angus shops, Montreal, during the autumn of 1912, for service on the Lake Superior division, which is recognized as one of the hardest on the whole system to operate, especially in the autumn and winter when the severe climatic conditions to be contended with, have to be given special consideration. It extends largely along the north shore of Lake Superior, through a rough and barren country, making operating conditions particularly severe.

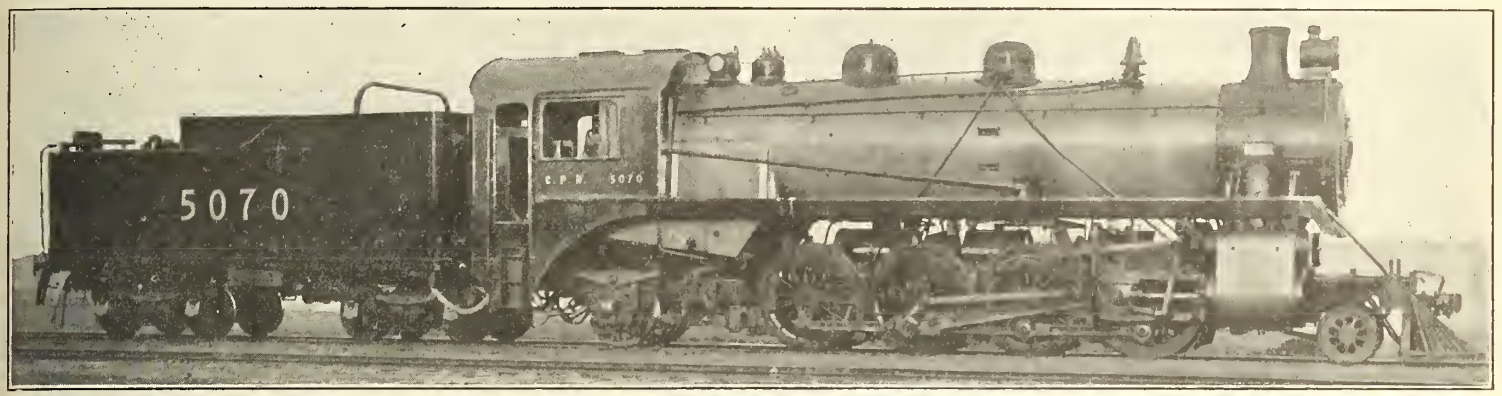


Fig. 1.—Mikado Locomotive, Canadian Pacific Railway.

In designing the original order of mikados, the C. P. R. took its standard consolidation locomotive as a base to work from, using all standard parts wherever possible. The cylinders, pistons, piston rods, cylinder covers wheels, axles, driving boxes, rods, and valve gear as far forward as the lifting link, are all interchangeable with those on the consolidations. From the lifting link back, the motion was changed to use the screw reverse gear. On the last order of 75, the cylinders were changed to bring the valve chest out to within ½ in. of the centre line of the cylinder, so as to eliminate the long rocker arm that was necessary in the other design to cross the motion over to the valve chest, which was located over the frame.

To make this alteration, a new combination back steam chest cover and valve stem guide was designed, similar to that applied to some lighter consolidations in 1908, as it had been found that these latter had given excellent service, requiring very little attention between shoppings of the locomotive. This cover consists of a double rocker arm 12 ins. long, which fits over both sides of the valve stem guide, with bosses of sufficient length to permit of the combination lever being applied on the outside of the guide and crosshead. One long pin passes through the combination lever, crosshead guide block and both arms of the rocker.

The valve stem guide is similar in design to that of the usual type of small stationary engine crosshead, being semi-circular top and bottom, with babbitted faces, which have the advantage of being renewed to compensate for any wear, by rebabbitting and turning to suit the valve stem guides on the cover. All other parts of the motion, with the exception of the combination lever, are interchangeable with those on the original order. The driving boxes are of cast steel; the hub facing and shoe and wedge faces are of brass, cast directly on the boxes. The idler and engine truck boxes also have cast brass facings.

The boilers are of the extended wagon top type, with an outside diameter at the first course of 72 ins., and at the dome course, of 79 ins. Both radial and cross stays are used in staying the firebox. The length of the flues between the flue sheets is 20 ft. 7⅜ ins., as opposed to the 15 ft. 1⅞ in. tube length of the consolidations, giving an approximate increase of 13.7% in the tube heating surface, with a corresponding increase in the superheating surface.

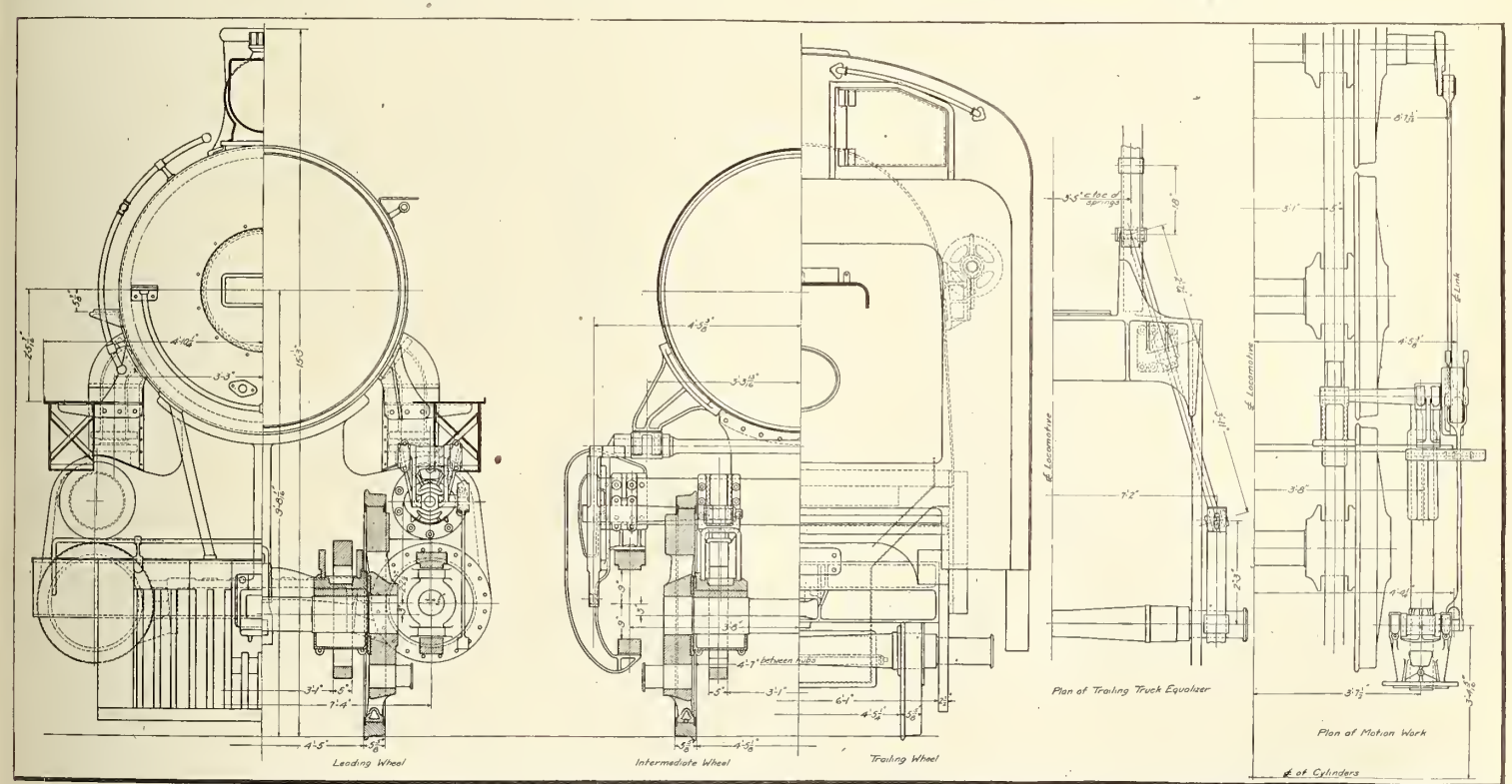


Fig. 3.—Cross Sections and Plan of Trailing Truck Equalizer and Motion Work on Mikado Locomotives, C.P.R.

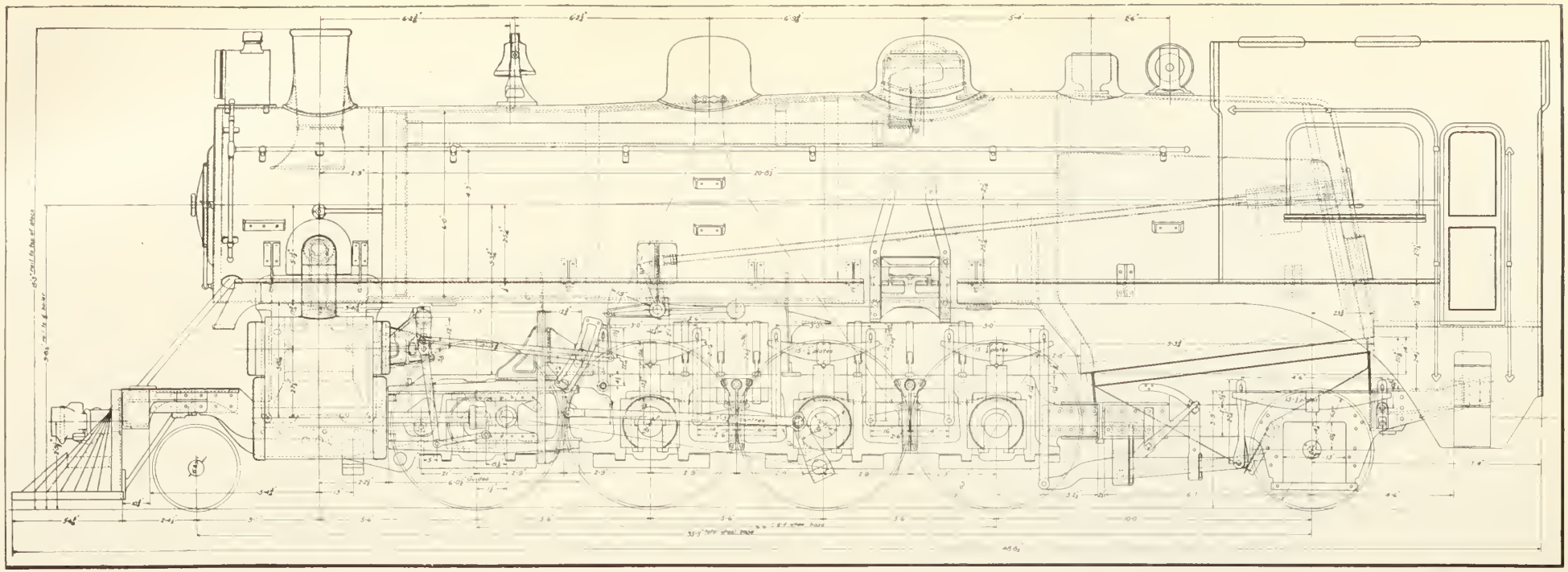


Fig. 2.—Side Elevation of Mikado Locomotives, Canadian Pacific Railway.

The firebox heating surface was also increased 11.4% by deepening the throat and lowering the grates at the back end, the grate area remaining the same as in the consolidations. The superheater is of the Vaughan-Horsey type, with thirty 5¼ in. flues and sixty 1¼ in. return superheater units, the latter extending to within 30 ins. of the back flue sheet. The gas area of the 5¼ in. flues, less the area of the superheater units, is practically 40% of the total tube gas area.

One of the principal features in the design of these mikados, is the style of trucks adopted. The trailing truck is the Vaughan outside bearing, with 7 by 14 in. journals, the same as on the C. P. R. standard Pacific type locomotives. This type of bearing has taper wedges set on top of the box and the bottom of the spring seat, to take up the necessary lateral movement, instead of having the usual 3 point suspension. With this arrangement of wedges, a constant lateral resistance is transferred to the rail, regardless of the degree of curvature, thereby permitting of a greater flexibility in adjusting the proper guiding power to the truck than would be possible in the case of the 3 point suspension. The wedges are lubricated with oil from a pocket formed in the spring seat over the top wedge.

The front truck is the same as that on the consolidations up as far as the truck frame, from which point the design was altered in order to take wedges instead of the ordinary king pin and swing bolsters. This truck frame is made of a box section, with pockets for the springs over the boxes. It also carries the bottom wedges set 18 ins. apart, and at an angle of 8½ degrees with the centre line of the truck, which allows for clearance between the wedge vertical edges when curving. The top wedge is carried on a bolster inserted between the frames, which is fitted into the bumper casting sidewalls with a total side play of ⅜ and ¼ in. respectively, front and back, the bolster being fitted with brass liners, and the bumper casting with cast iron liners, which present an easy means of taking up excessive side play of the bolster. The front end of the truck equalizer rests on top of the bolster. The wedges of the truck are lubricated with hard grease.

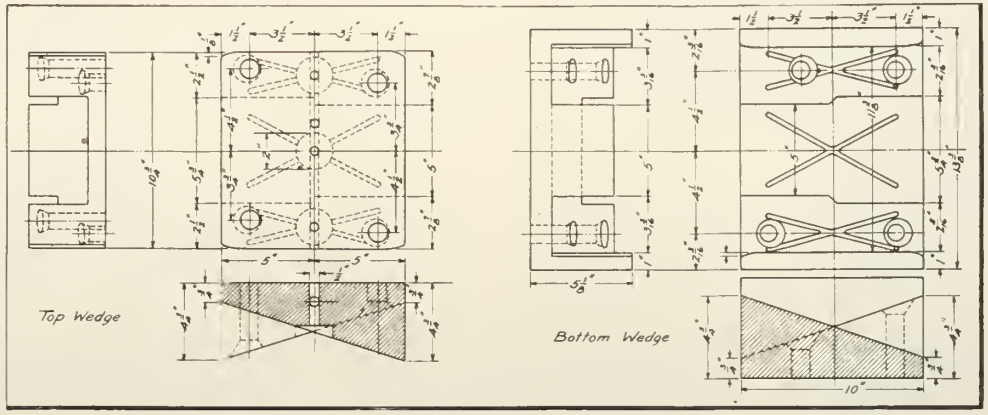


Fig. 4.—Detail of Front Truck Wedges, Mikado Locomotives, C.P.R.

The wedges on both trailing and engine trucks are designed with double faces having equal bearing surfaces, which permits of a parallel movement upward at all times, with only one set of faces in service at a time. Fig. 4 shows details for the front wedges used on the front truck. A series of running tests were made on both trucks to determine the most desirable taper, one which would give the necessary guiding power to the trucks when running and at the same time give the required freedom on curves. After several such tests, in which wedges of different tapers were applied to both trucks, tapers of 1 in 2½ for the front truck, and 1 in 6 for the back truck, were adopted. The guiding power of this style of front truck, with wedges having a taper of 1 in 2½, in comparison with a truck having 7½ in. swing links and 3 in. centres, is shown in the accompanying curve, fig. 5. From this comparison, it will be observed that the curve representing the guiding power of the wedge truck is a straight line, giving a constant guiding power for any movement of the truck, as compared to the variable guiding power of the swing link type, where an equal amount of guiding power is not obtained until the link has moved over about 1⅝ ins.

The vestibule cab, which was fully described in Canadian Railway and Marine World for June, 1912, was also applied to these locomotives. It is completely enclosed, with entrance through a side door, a flexible connection being maintained between the locomotive and tender by means

of a spring maintained contact.

The tenders are of the combined tank and underframe type, with capacity for 7,000 imperial gallons of water and 16 tons of coal. They are equipped with hinged type coal pushers, which are operated by two 12 in. cylinders, controlled from the cab. The tender trucks are of the pedestal equalizer type, with cast steel bolsters, 6 by 11 in. axles, McCord boxes and inside hung brakes.

These locomotives are giving excellent satisfaction in freight service, and since the first of this year, two of them have been placed in passenger service on the main line from Montreal to Halifax, between Sherbrooke and Megantic, which is a very hilly country, with a ruling grade of 1.72%, over which it is possible with the new motive power, to maintain a schedule of 30 miles an hour, dispensing with the double headers formerly required over this division.

The following gives a comparison of the weights, dimensions and ratios of the new mikados and the older consolidations from which they are based:

Type	2-8-2	2-8-0
Class	P-1	N-3
Service	Freight	Freight
Fuel	Bituminous	coal.
Tractive effort, lbs	42,000	42,000
Weight, lbs., working order	258,000	220,000
On drivers	198,000	198,000
On leading truck	25,000	22,000
On trailing truck	35,000	....
Locomotive and tender, working order	428,000	362,000
Wheel base, driving	16 ft. 6 ins.	16 ft. 6 ins.
Total	35 ft. 5 ins.	25 ft. 5 ins.
Locomotive and tender	66 ft. 5 ins.	53 ft. 4¼in
Weight on drivers—tractive effort	4.7	4.7
Total weight—tractive effort	61.5	52.4
Tractive effort x diam of drivers—equivalent heating surface	560	762
Total equivalent heating surface—grate area	94.8	70
Firebox heating surface—total equivalent heating per cent	3.97	4.75
Weight on drivers—total equivalent heating surface	41.8	57.0
Total weight, total equivalent heating surface	54.5	63.4
Volume of both cylinders, cu. ft	16.06	16.06
Total equivalent heating surface—volume of cylinders	294.4	216.2
Grate area—volume of cylinders	3.11	3.08
Cylinders, Kind	Simple	Simple
Diameter and stroke, ins	23½ x 32	23½ x 32
Valves, kind	Piston	Piston
Diameter, ins	12	12
Maximum travel, ins	6 in.	6 in.
Lap and lead	1 in., ¼ in.	1 in. and ¼in.
Inside clearance	Line and line	Line and line
Wheels, driving, diam. over tires, ins	63	63
Driving, thickness of tires, ins	3½	3½
Engine truck, diam. over tires, ins	31	31
Trailing truck, diam. ins	54	
Journals, driving, main, ins	10 x 14	10 x 14
Driving, others, ins	9½ x 14	9½ x 14
Engine truck, ins	6 x 11	6 x 11
Trailing truck, ins	7 x 14	....
Boiler, style	Extended	wagon top.
Working pressure, lbs	180	180
Outside diam., first ring, ins.	72	72
Firebox, length and width inside, ins	103¼ x 69⅞	102 7/16 x 69¾
Firebox plates, thickness, ins	½, ⅜, 5/16	½, ⅜
Firebox water space, ins	5, 4½, 3½	5, 4½, 3½
Tubes, number and outside diam., ins	210, 2¼	210, 2¼
Flues, number and outside diam., ins	30, 5¼	30, 5¼
Tubes, thickness, IWG number	11	11
Flues, thickness, BWG number	8	8
Length over tube sheets	20 ft. 8½ ins.	15 ft. 2¾ ins.
Heating surface, tubes, sq. ft	3,410	2,495
Firebox, sq. ft	188	165
Total, sq. ft	3,598	2,660
Superheating surface, sq. ft.	760	545
Equivalent heating surface, sq. ft	4,738	3,477
Superheating tubes, diam., and thickness, ins	1¼, 3/16	1¼, 3/16
Superheating tubes, average length	19 ft, 4½ ins.	13 ft. 10¾ins
Grate area, sq. ft	50	49.6
Tender, style	Combined tank and underframe.	
Journals, ins	6 x 11	5½ x 10
Water capacity, Imperial gallons	7,000	5,000
Coal capacity, tons	16	12

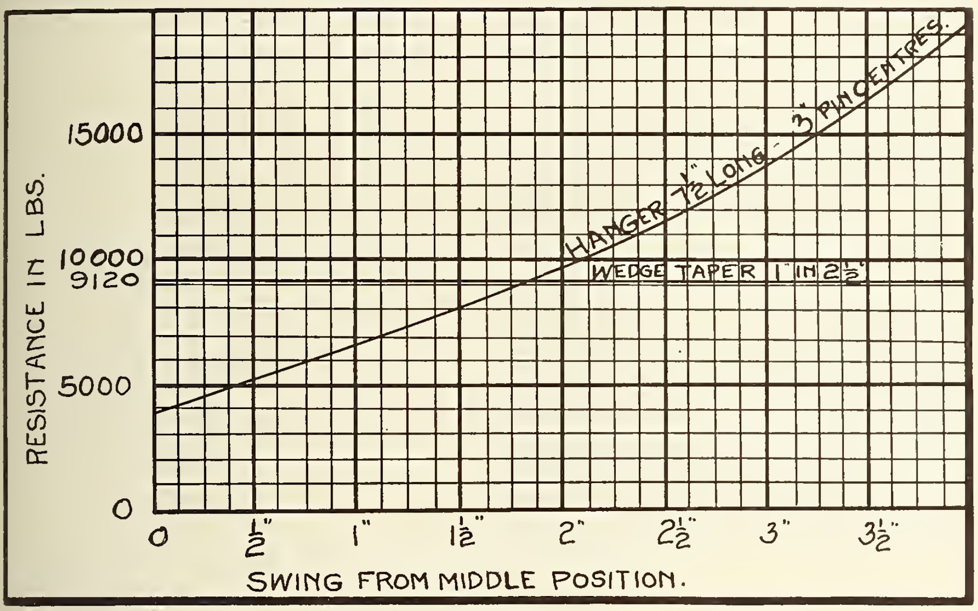


Fig. 5.—Comparison of Guiding Power of Wedge and Link Suspensions on Locomotive Trucks. Mikado Locomotives, C.P.R.

Victoria Rolling Stock and Realty Co. of Ontario, Limited.

Following are extracts from the report for the year ended Feb. 15, 1914, presented at the annual meeting in Toronto recently:—

During the year the company arranged for a new lease with the C.P.R. Co. amounting to $14,100,000 against mixed rolling stock, and pending further arrangements the C.P.R. has advanced to this company the full cost of the rolling stock delivered to date and hold as collateral against this advance the balance of the outstanding debentures.

During the year outstanding debentures against leases have been reduced by $630,-000. All payments during the year have been promptly met. The profit on the year's business, after charging up directors' fees and expense account, is $38,103.04, out of which a dividend of 6% per annum on the paid up capital stock has been paid, amounting to $14,400, leaving $23,703.04 carried forward to profit and loss account, which now stands at $91,189.60.

ASSETS.

Obligations on leases	$14,380,208.33	
Less unpaid	313,055.69	
		$14,067,152.64
Cash in bank		145,833.14
Call loans		240,000.00
Debentures held by company a/c, C.P.R. and interest accrued on advances		13,631,814.80
		$28,084,800.58

LIABILITIES.

Capital stock subscribed	$600,000.00	
Capital stock paid up		$ 240,000.00
Debentures outstanding		14,430.00
Interest accrued on same		6,666.67
Advances from C.P.R. against new lease		13,316,944.31
Balance at credit of profit and loss		91,189.60
		$28,084,800.58

PROFIT AND LOSS ACCOUNT.

Balance at credit, Feb. 15, 1913	$ 67,486.56
Rents received and accrued on leases and interest on advances and debentures held by company	712,783.93
	$780,270.49
Interest paid and accrued on debentures	$672,502.10
Expense account	878.79
Directors' fees last year	1,300.00
Dividend account	14,400.00
Balance carried forward	91,189.60
	$780,270.49

MEMORANDUM re ROLLING STOCK.

Original cost of rolling stock held under existing leases	$17,039,370.00
Amount paid in on account by railway companies in addition to interest	2,609,370.00
	$14,430,000.00
Total amount of company's debentures outstanding	$14,430,000.00

The officers for the current year are:—President, Sir Edmund B. Osler; Vice President, W. D. Matthews; Other directors:—Duncan Coulson, Hon. J. S. Hendrie, F. G. Osler, D. R. Wilkie; Secretary, G. F. Chisholm.

Dry Grass, Weeds, Etc., on the Right of Way.

The Board of Railway Commissioners has issued a circular calling railway officials' attention to sec. 297 of the Railway Act, which provides that "The company shall at all times maintain and keep its right of way free from dead or dry grass, weeds and other unnecessary combustible matter."

Attention is especially needed as to the annual growth of grass and other vegetation on rights of way, particularly through forest sections. This can, as a rule, be readily and safely burned off as soon as the snow has disappeared from the right of way, and while the adjoining lands are still too wet to permit the spread of fire.

Attention is also called to the necessity for a thorough clean up of yards and sidings, especially where the peeling and loading of timber has resulted in the accumulation of inflammable debris.

The work of burning or otherwise disposing of combustible matter on rights of way should accordingly be begun at the earliest possible date in the spring and prosecuted vigorously until completed. As required by regulation 9 of General Order 107, such supervision of burning must be provided as will prevent fires from spreading beyond the strip being cleared.

The Board requests the submission of statements showing what arrangements have been or will be made for handling this work on the various lines.

The Lackawanna Rd. is to build a new station at Buffalo, N.Y.

Railway Mechanical Methods and Devices.

Wheel and Axle Hoist of Canadian Northern Railway.

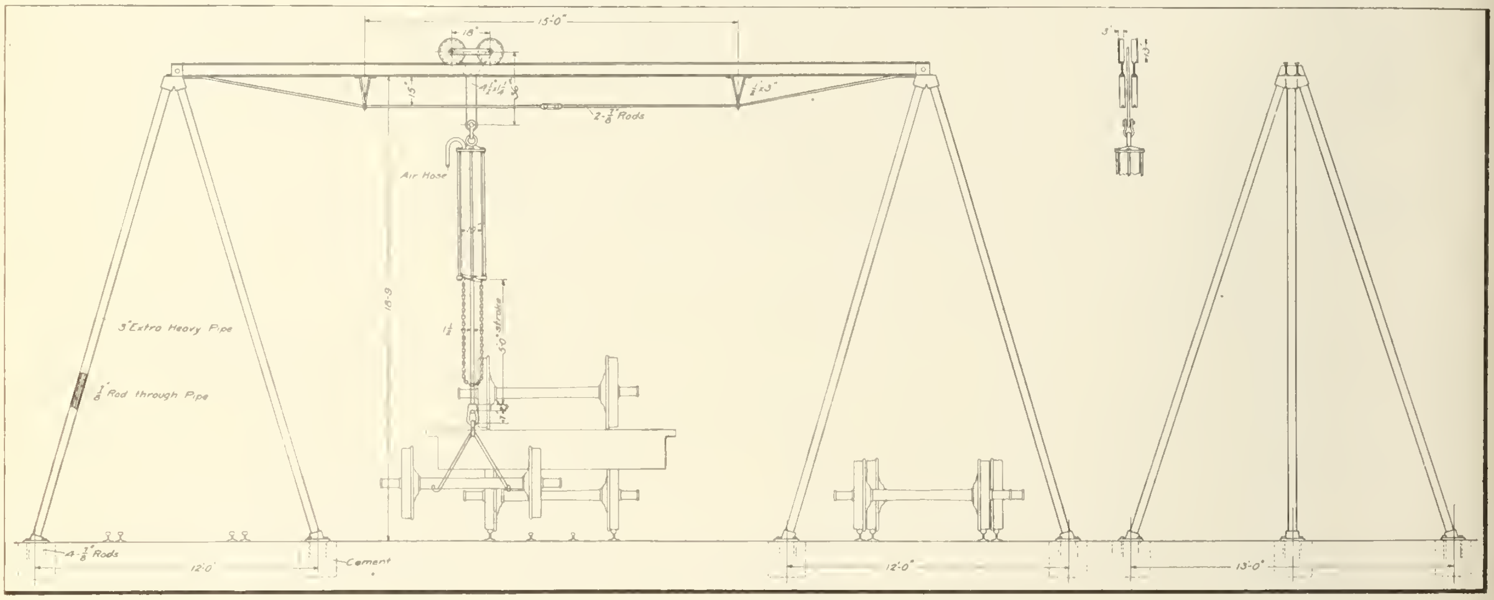
The C. N. R. has adopted as standard practice, the wheel and axle hoist shown in the accompanying illustration, and the arrangement has been found most useful in the expeditious handling of wheels and axles in and out of the shop. It consists of an overhead travelling hoist used for loading and unloading car wheels from the storage yard to flat cars for transmission to other points on the system, or on shop cars, for transferring into the shop for remounting, etc.

The runway consists of a 30 ft. span, made up of two 6 in. 17.25 lb. I beams, placed side by side at 6 in. centres. Each I beam is trussed by a ⅞ in. truss rod bearing up against 15 in. truss rod struts at 15 ft. centres. The ends of the runway are supported on pipe tripods, these latter consisting of 3 in. extra heavy pipe, through the centre of each which passes a ⅞ in. rod, with a nut on each end. Each tripod leg fits into a triple cap at the top, and cast iron shoes at the bottom, these latter resting on concrete foundation blocks, 20 ins. square, let into the ground, and grouted on top. They are secured in place by four bolts in each block, the lower end of each block being fitted with a washer.

The trolley has two pairs of 12 in. wheels at 18 in. centres, mounted on 2½ in. axles. A Y-shaped hanger, made of 4½ by 1¼ in. stock, is suspended from the trolley axles between the wheels, passing down between the I beams, with the hoist cylinder attached to the lower end. This air cylinder has a 10 in. diameter and 60 in. stroke, with the control operated by a double chain attached to the air valve.

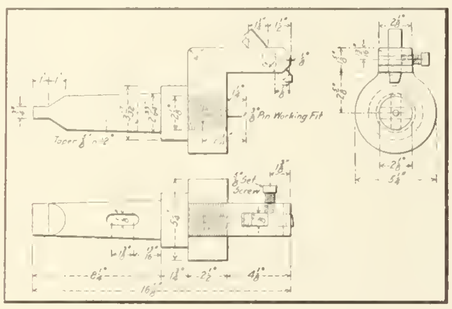
Under the central part of the crane, there is a standard gauge track leading in from the yard, and also a 20 in. narrow gauge service track intermediate to it, leading out from the shop, which is just back from and parallel with the crane runway. Wheels may be brought in over the yard track, or out from the shop over the service track and be handled by the hoist. Under the tripod legs, there are on each side a pair of storage tracks, the pair on one side for receiving wheels from the road, and the other for storing the wheels as they come from the machine shop, the hoist serving both pairs of tracks as well as the central feeder tracks. With this hoist, it is said that two men can load or unload a car containing from 14 to 18 pairs of wheels in from 15 to 20 minutes.

The narrow gauge service track car is of interest from the peculiar design. There are two pairs of 12 in. wheels mounted on 2½ in. axles, at 7 ft. centres. On each of these axles, there is mounted an 8 by 12 in. block, bolted to the axle journals. Between these two blocks, there are four 3 by ½ in. bars, bent upward at the end, and secured to the end blocks. Under the central portion of the car, they are on edge, with separating blocks between. The floor, or top of these bars, is 6 ins. above rail level.



Wheel and Axle Hoist on Canadian Northern Railway.

Boring Mill Tool for Turning Difficult Surfaces.



Boring Mill Tool for Turning Surfaces That Cannot be Handled in the Lathe.

The tool shown in the accompanying illustration is used for turning difficult surfaces that cannot be handled in the lathe, in the boring mill. These difficult parts include such operations as the turning of grease cups on driving rods, turning the ends of rocker arms, and truing the ends of rocker shafts. It was designed for use on the horizontal boring mill.

The tool is made in two parts, as it was found that by so doing it could be made more easily and at a lesser cost. The shank is a solid taper plug, threaded on the outer end, with a driving tang on the other end. This is threaded into one arm of a right angle head member, this latter bearing up against a shoulder on the taper shank. Making the tool in two parts like this has the additional advantage of renewal of the head in case the latter is injured. The turning tool is carried at an angle in a slot in the projecting arm of the head, and is held in position with a set screw.

In the centre of the outer end of the shank there is a ⅜ in. pin, a working fit in the shank, which is used for centring the tool to the work, but which is removed from the shank once the work is trued up in order that the head might work up as far as possible over the member being machined.

When truing up the ends of tumbling shafts, the shaft is placed in V blocks on the table and centred with the ⅜ in. pin in the tool, and a dead centre placed in the boring bar support. After it is firmly clamped, the centre pin is removed from the jig, and the bearings are then trued up. The tool is placed at an angle of 15 degrees, so that the point of the tool will be in advance of the end of the jig. The information in regard to this tool is taken from the Railway Age Gazette, Mechanical Edition.

Cab Storage at Grand Trunk Railway Montreal Shops.

As pointed out in the last issue of Canadian Railway and Marine World, in describing the locomotive tire storage system of the G.T.R. Montreal shops, it is most essential, if repair work is to be handled expeditiously and at low cost, that the parts in most frequent demand should be conveniently stored, where they may be got out quickly, as required. Certain standard parts of a locomotive may be made before the demand for their use arises, minimizing the time shopping to that extent when it becomes necessary to renew that part.

This applies to locomotive cabs, which are more or less standard on the different types of locomotives in use on the G.T.R. At the Montreal shops there are always on hand at least a dozen, which has been found to be a time saver when a locomotive comes in that requires only a cab renewal, all that

is required being the replacing of the old cab with a new one from stock.

To make the cabs convenient for ready application, a storage space has been set aside, which resembles closely the tire storage space at the same point, referred to above. The cab storage space is shown in the accompanying illustration. Three rows of old bridge columns support three runways, with two parallel craneways, the cranes on which are hand operated, wherein they differ from the tire storage space, where the crane is electrically operated, necessitated by the frequent use to which the yard is put. In the cab space the cabs are raised from the ground on low frames, and are ranged side by side, to be conveniently got at. The same storage space is used for the stock of pilots, which are always kept in store for quick repairs.

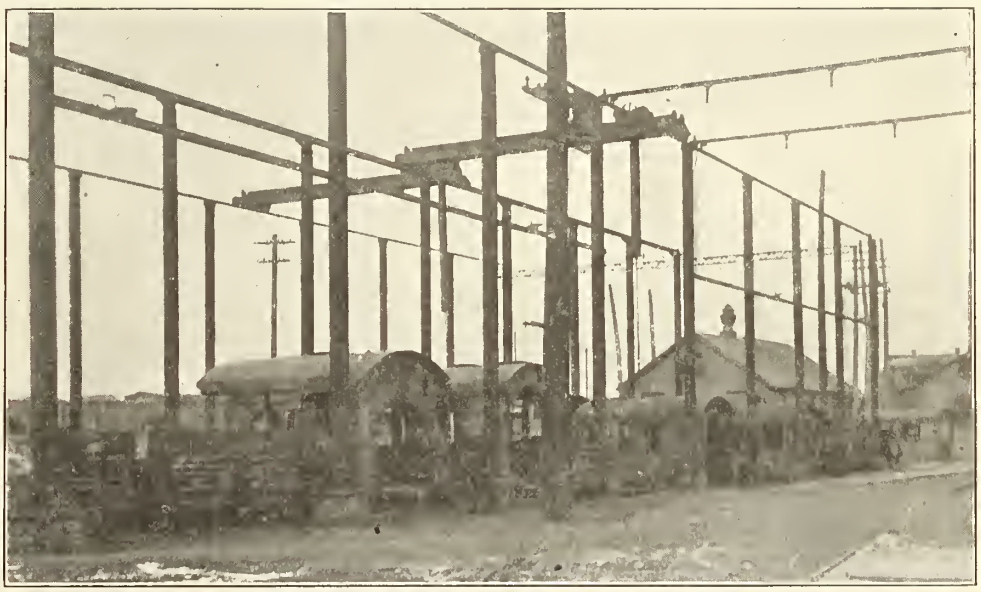
Removing Centre Sills at Canadian Pacific Ry. West Toronto Car Shops.

The C. P. R.'s general policy about wooden freight car repairs has been, when a car comes into the shops requiring a new centre sill, to replace the damaged centre sill by the new C. P. R. steel centre sill, which can be applied to wooden equipment with practically no change in the car design, the steel sill slipping into place in the position formerly occupied by the wooden sill, the connecting members all fitting to the new steel sill with but little adjustment.

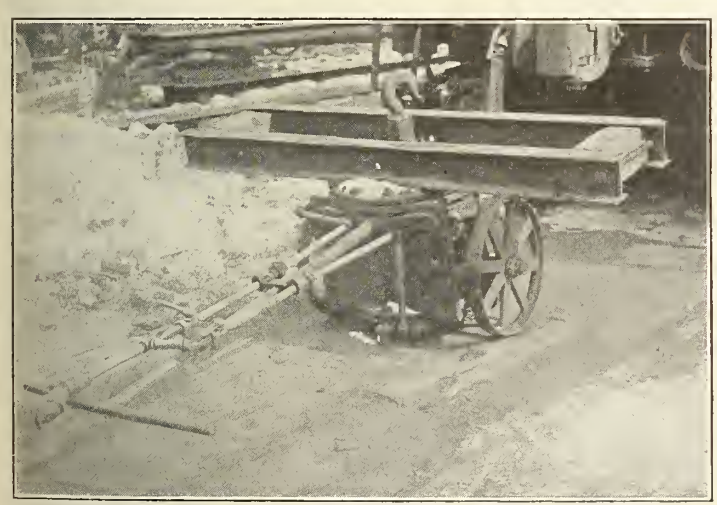
In the removal of the old wooden sills, whether for replacement with wooden or steel sills, the West Toronto shops have in use a type of air jack, manufactured on the premises, which does excellent work, not only in the speed with which it is executed, but also from the manner in which it does it without damage to the body of the car. The usual procedure is to first of all remove the draft gear, needle beams, truss rods, and any other members that are attached to the sills. Then, with considerable effort, resulting in the removal of a good portion of the floor, the nails from the floor into the sills are removed, when, with some prying, the sills can be dropped to the ground from under the jacked up car. The sills are then taken out from under the car.

With the use of the device herewith illustrated, this procedure is somewhat altered. The car is jacked up as usual on trestles, the trucks removed, and all attached parts loosened from the sills. Then, under one end of the sills, the double I beam member is placed, blocked on its ends from the under side of the side sills, and held up under this blocking by chains. The air jack shown consists of an old locomotive air cylinder, mounted on wheels, with air connection pipes and valves attached to the handle of its truck. This air jack truck is run in under the I beam member, directly below the sill to be removed. A small hole is cut in the floor directly over the sill, over which a chain is passed from the hook on the end of the air cylinder plunger rod, when the latter is in its uppermost position. Turning on the air causes the plunger to descend, pulling the cylinder up against the I beam member, and bodily drawing the sill away from the nails and other minor holding obstructions in the car floor. Moving the jack and I beam member along further under the centre of the car, the operation is repeated, this second pull completely loosening the sill, which may then be drawn out from under the car on the air jack truck, from the end of the car. The operation is very quickly performed.

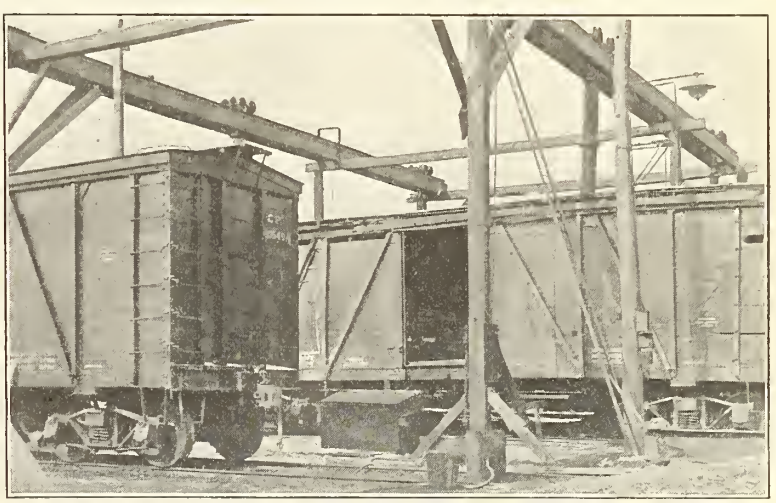
For the replacement of steel sills for the wooden ones, the yard crane arrangement shown herewith was built at the West Toronto shops, and is used in conjunction with the jack. The crane consists of runway tracks at right angles to the yard tracks. and covering four tracks. The overhead crane carries air plunger hoists. Alongside the tracks, the steel sills, as received complete from Montreal, are unloaded ready for use. The car to have the sill replaced is jacked up to the right of the crane position in the illustration, and the trucks removed from underneath, the trucks being run under the crane. While the old sill is being removed, a new steel sill is being applied to the two trucks, the combined trucks and sill on completion being run back under the jacked up car. The crane is used for fitting the sill on the trucks, lifting the sill from the storage pile to the truck.



Crane Served Storage Space for Cabs and Pilots.



Air Jack for Removing Damaged Wooden Centre Sills.



Crane for Handling Centre Sill Repairs.

Pile Driver on Intercolonial Work.—What is said to be the largest pile driver ever built has been used in driving the large concrete piles in the I.R.C.'s ocean terminal at Halifax, N.S. The combined weight of the hammer with follower is stated to be 24,000 lbs.; weight of ram only, 4,000 lbs.; diameter and stroke of cylinder, 14 by 36 ins. The hammer is said to have driven 1,800 reinforced concrete piles, 24 ins. square, varying in length from 37 to 77 ft.

Electric furnaces for the ordinary steel foundry are now being regularly built and are claimed to give good results, electric melting having many advantages from a metallurgical standpoint. The new electric furnaces are made as nearly automatic in action as possible and many improvements in their design have been introduced during the last few years, so that it is claimed to be easier at present to get good results from an electric furnace than from the ordinary type.

Steam Railway Freight Statistics.

The aggregate tonnage of freight carried by Canadian railways during the year ended June 30, 1913, was 106,992,710 tons, against 89,444,331 in the previous year, and 79,884,282 tons for the year ended June 30, 1911. Of the total tonnage carried during the last statistical year, 56,829,297 tons originated on home lines, 21,284,742 were received from other lines in Canada, and 27,317,214 were received from U.S. railways. This is the first year in which the tonnage received from other lines has been divided so as to show that received by Canadian lines from U.S. lines. The totals of the three columns in the following table do not aggregate 106,992,710 tons, the difference being caused by the fact that the G.T. Pacific Ry. carried 1,561,457 tons, which is not divided under the several headings. Figures showing the total freight tonnage on each line are given in a table on pg. — of this issue.

Name of Railway.	Originating on own line.	Received from other lines in Canada.	Received from U. S. Lines
Algoma Central and Hudson Bay	365,588	29,949	
Algoma Eastern	613,891	770	
Atlantic, Quebec and Western	8,413	9,892	
Bay of Quinte	159,549	121,351	
Bedlington and Nelson	1,695		421
Brandon, Saskatchewan and Hudson Bay	58,055	181	19,097
British Yukon	61,964		
Brockville, Westport and North Western	15,047	26,507	
Canada Southern	940,824	377,908	7,269,305
Canadian Govt. Rys.—Intercolonial	3,516,430	1,800,031	
" " P. E. Island	113,070	9,644	
Canadian Northern	5,476,842	943,103	401,866
" " Ontario	735,497	278,613	
" " Quebec	608,721	310,297	124,513
Canadian Pacific	21,044,667	6,458,718	1,968,429
Cape Breton	1,967	3,442	
Caraquet	24,626	10,334	
Central Ontario	195,221	99,023	
Crow's Nest Southern	218,242	51,776	12,280
Canada and Gulf Terminal	16,728	4,031	
Cumberland	354,122	12,367	
Dominion Atlantic	296,409	71,488	
Eastern British Columbia	162,006	1,863	
Elgin and Havelock	9,140	3,038	
Essex Terminal	55,682	106,192	
Esquimalt and Nanaimo	376,890	101,671	
Grand Trunk	9,065,232	2,823,204	9,153,370
" " (Canada Atlantic)	970,276	907,395	51,193
" " Pacific (see below)			
Halifax and South Western	261,121	33,956	
Hereford	129,575	3,853	4,104
Inverness Ry. and Coal Co.	288,842	13,890	
Irondale, Bancroft and Ottawa	16,671	10,158	
International of New Brunswick	100,242	6,390	
Kent Northern	5,835	5,709	
Kettle Valley	2,458	20	159
Kingston and Pembroke	41,589	41,871	5,400
Klondike Mines	44,400		
Lotbiniere and Megantic	49,407	2,440	65
London and Port Stanley	21,529	15,951	605,440
Maine Central			188,942
Manitoba Great Northern	42,329	4,254	52,232
Maritime Coal Ry. and Power Co.	204,291	4,776	
Massawippi Valley	159,573	420,495	153,957
Moncton and Buctouche	19,025	4,563	
Midland Ry. of Manitoba	3,715	68	223,519
Montreal and Atlantic	108,404	770,014	491,044
Montreal and Province Line	20,436	74,888	4,688
Montreal and Vermont Jct.	14,889	276,907	98,808
Morrisey, Fernie and Michel	830,405	21,353	
Napierville Jct.	10,351	94,810	305,568
Nelson and Fort Sheppard	18,387	447	12,278
New Brunswick Coal and Ry. Co.	62,483	5,887	
New Brunswick and P. E. Island	39,366	10,427	
New Westminster Southern	34,116	29,187	
North Shore	3,930		
Ottawa and New York	66,974	75,189	181,000
Pere Marquette	58,692	228,868	2,594,337
Quebec Central	930,999	174,012	
Quebec and Lake St. John	395,929	144,422	
Quebec, Montreal and Southern	89,618	333,621	39,179
Quebec Oriental	16,307	25,767	
Quebec Ry., Light and Power Co.	180,406	12,669	
Red Mountain	1,885	43	20,884
Rutland and Noyan	167	316,857	19,865
Salisbury and Albert	41,553	5,936	
Schomberg and Aurora	7,180	3,683	
Stanstead, Shefford and Chambly	14,326	300,117	100,089
St. Clair Tunnel			
St. Lawrence and Adirondack	32,735	220,847	792,689
St. Martin's	8,343	4,115	
Sydney and Louisburg	4,732,016	179,037	
Temiscouata	173,696	13,857	
Thousand Islands	421,071	229,176	
Timiskaming and Northern Ontario	20,295	25,475	
Toronto, Hamilton and Buffalo	296,239	2,491,789	
Vancouver, Victoria and Eastern	999,768	11,275	436,746
Victoria Terminal Ry. and Ferry Co.	10,073	33,659	
Victoria and Sidney, B.C.	21,161	24,121	
Wabash (in Canada)	23,841	9,419	1,985,767
Wellington Colliery	274,180	4,362	
York and Carleton	11,691	1,327	
Final total	56,829,297	21,284,742	27,3 7.214

Originating on own lines	56,829,297	tons
Received from other Canadian lines	21,284,742	"
Received from U.S. lines	27,317,214	"
G.T.P.R. not distributed	1,561,457	"
	106,992,710	tons

The Board of Railway Commissioners Report.

The great delay in the issuing of blue books at Ottawa, due probably to congestion in the printing bureau, renders the contents of many of them so stale when they are issued that they are of little current value. The Board of Railway Commissioners' report for the year ended March 31, 1913, has not yet been printed and is not expected to be for some months, but the following summary of some of its principal contents has been given out:—

During the year the Board held 102 public sittings, at which 698 applications were heard, as compared with 89 sittings for the previous year at which 695 applications were heard. The number of public sittings held in the various Provinces were as follows:—Ontario, 64; Quebec and Maritime Provinces, 13; Manitoba, 6; Saskatchewan, 7; Alberta, 6; British Columbia, 8. The applications heard included a variety of matters under the Railway Act, from the complaint of a private individual to matters of more general public interest affecting the community at large, such as express rates, railway company's tariffs, telephone rates, telegraph tolls, and matters pertaining to the operation of railways generally. The number of general orders issued was seven, and the number of general circulars issued to all railways subject to the Board's jurisdiction was 14. The total number of orders issued was 2,785, a slight decrease from the preceding year. In addition to the matters heard at formal sittings there were a large number of informal matters dealt with. Of a total of 5,751 applications and complaints dealt with by the Board, only 8.2% were set down for formal hearing and 91.8 were disposed of without a formal hearing. These informal complaints, which are settled without the necessity of a formal hearing, often times entail a very considerable amount of correspondence and enquiry on the part of the Board's officers.

Traffic Department.—The number of tariffs received and filed were as follows, including supplements: Freight, 49,200; passenger, 6,774; express, 17,994; telephone, 2,051; sleeping and parlor car, 22; telegraph, 17; making a total of 76,058, or a grand total to Mar. 31, 1913, of $394,989 tariffs.

Engineering Department.—A large number of inspections were made covering the Dominion. They numbered 316 and included inspections of bridges, subways, highways and farm crossings, interolcking plants, opening of lines for traffic, culverts, fences, cattle guards, etc.

Operating Department.—In this department is included the investigation of accidents, car service, condition of rolling stock, etc. The total number of killed and injured, reported by the various railway companies for the year was 2,547, of which 643 persons were killed and 2,231 injured. Of the total of 643 persons killed 250, or approximately 39% of the total, were trespassers on railway tracks. Twenty-one passengers were killed, or 3.26% of the total. Of this total of 21 passengers killed it appears that 15 met death by what would appear to be preventable causes on the part of the passengers themselves, such as falling off trains while in motion, endeavoring to board trains in motion, and endeavoring to get off trains in motion, so that the actual number of passengers killed in what might be termed preventable causes on the part of the railway companies, was only 6, or less than 1% of the total number of 643 persons killed. The railway employes killed numbered 303, or 47% of the total. Of the total injured 410, or 17.9%, were passengers, and of this number 75, or 18.3%, were injured from preventable causes on the part of the passengers injured, such as attempting to get off and on trains in motion. Of the total of persons injured 1,603, or 71.8%, were employes of the railway companies. It will be noted that of what may be termed the preventable loss, 250 killed fall under the heading of trespassers, which is a very large percentage of the total killed, and in this connection the Board has taken up with the attorney general of the various Provinces, the question of prosecuting trespassers on railway property, with a view to limiting the large number of fatalities which occur in this way. The following table shows the totals by Provinces as regards trespassers killed and injured:—

	Killed.	Injured.
Ontario	132	62
Quebec	35	21
Alberta	19	7
Saskatchewan	14	10
British Columbia	31	7
Manitoba	14	6
New Brunswick	4	6
Nova Scotia	1	1
Yukon	1	—
	250	116

Fire Inspection Department.—The organ-

ization of this Department was proceeded with immediately following the issuance of order 16,570, May 20, 1912, which deals with the question of fire protection generally, throughout the Dominion. During the season of 1913 200 fires were reported as started within 200 ft. of railway tracks and the classification of the causes of the fires shows that 164 are credited to trains, and the balance of 36 are ascribed to tramps, camp fires and unknown causes. The acreage burned over by the fires outside of the right of way of cultivated land, 4,135 acres, of young forest growth, 17,017 acres, of timber land, 1,322 acres, and of slash or old burn, not restocking, 2,674, making in all a total of 25,148 acres visited by fire. The total value of the property destroyed by fire, as reported, is estimated at $88,480. These figures relate only to lands adjacent to railway lines subject to the Board's jurisdiction.

Birthdays of Transportation Men in May.

Many happy returns of the day to:—

Jas. Bain, General Superintendent, Halifax and South Western Ry., Bridgewater, N. S., born at Pictou, N. S., May 24, 1860.

W. R. Baker, Secretary, and Assistant to President, C.P.R., Montreal, born at York, Eng., May 25, 1852.

G. S. Cantlie, General Superintendent Car Service, C.P.R., Montreal, born there May 2, 1867.

M. Donaldson, M. Can. Soc. C.E., Vice President and General Manager, Grand Trunk Pacific Ry., Winnipeg, born near Edinburgh, Scotland, May 1, 1851.

A. E. Duff, ex-District Passenger Agent, G.T.R., Toronto, now of Winnipeg, born at Sherbrooke, Que., May 1, 1872.

G. C. Dunn, District Engineer, G.T.P.R., Winnipeg, born at Quebec, May 13, 1862.

G. I. Evans, Superintendent, Angus Locomotive Shops, C.P.R., Montreal, born there, May, 1880.

M. A. Fullington, A.M. Can. Soc. C.E., Assistant Superintendent, District 4, Eastern Division, C.P.R., Ottawa, born at Johnson, Vt., May 12, 1880.

D. J. Hackett, Superintendent, Canada Division, Michigan Central Rd., St. Thomas, Ont., born in Cass County, Mich., May 1, 1868.

G. H. Hedge, Master Mechanic, Central Division, Canadian Northern Ry., Winnipeg, born at Neath, Wales, May 26, 1865.

T. Henry, Operating Superintendent, Passenger Steamers, Canada Steamship Lines Ltd., Montreal, born there, May 29, 1865.

G. A. Hoag, Superintendent, Central Ontario Ry., Trenton, Ont., born at Walter's Falls, Ont.. May 31, 1866.

W. T. Huggan, Division Accountant and District Passenger Agent, Prince Edward Island Ry., Charlottetown, P.E.I., born at Halifax, N.S., May 24, 1851.

J. Irwin, Superintendent, District 3, Canadian Northern Ry., Dauphin, Man., born at Clinton, Ont., May 28, 1866.

A. C. Shaw, General Passenger Agent, Western Lines, C.P.R., Winnipeg, born at Detroit, Mich, May 12, 1865.

H. B. Sherwood, Superintendent, Bay of Quinte Ry., Napanee, Ont., born at Auburn, N. Y., May 25, 1847.

W. Stapleton, District Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Bristol, Eng., May 20, 1884.

E. Tiffin, General Western Agent, Canadian Government Railways, Toronto, born at Hamilton, Ont., May 5, 1849.

J. H. Walsh, General Manager, Quebec Central Ry., Sherbrooke, Que., born at Quebec, May 12, 1860.

H. K. Wicksteed, B.A.Sc., M. Can. Soc. C. E., Chief Engineer of Surveys, Mackenzie, Mann & Co, Ltd., Toronto, born at Quebec, May 25, 1855.

James Yeo, ex-Roadmaster, Intercolonial Ry., Riviere du Loup, Que., born at Bideford, Devonshire, Eng., May 1, 1830.

The Grand Trunk Pacific Hotel at Regina.

Building operations have been commenced at Regina, Sask., by the G. T. P. R. on the Hotel Qu'Appelle. The site selected is Wascana Park at the corner of Sixteenth Ave. and Albert St., two sides facing these thoroughfares and the other elevation overlooking the park and commanding a view of the Legislative Buildings. The building will be set back from the street line sufficiently to give it a setting and relationship to the surrounding landscape that will take advantage of the situation to the fullest extent. Architectually, like the other hotels on the system, it will be of the chateau type.

Grand Trunk Pacific Ry. Hotel Qu'Appelle, Regina, Sask.

Immediately opposite the hotel, the station will be erected, providing convenient and immediate communication with the hotel. The station building will also include the power house from which light, heat and power service will be transmitted to the hotel through a service tunnel under the streets.

The main entrance of the hotel will be placed in the centre of the Albert St. elevation. A few steps will lead from the entrance to the concourse or rotunda and immediately opposite this entrance, commanding also the ladies' entrance, the elevator, stair, palm room and dining room approaches, will be the office. Adjoining the rotunda will be the telephone and telegraph booths and the news and cigar stands. The palm room and main dining room will overlook the park, and doors from the palm room will open on to a terrace from which steps will lead down to the park. The main dining room, palm room and rotunda will extend through the height of two stories, the main floor and the mezzanine. The mezzanine will provide a musicians' gallery for the dining room, a gallery overlooking the rotunda, and a spectators' view of the dining room. It will also provide a private dining room, and a small banquet room and manager's office. Immediately upon entering and before ascending the few steps to the main floor, approach may be made to the grill room and bar by stairs leading left and right from this entrance landing. Above the main floor and the mezzanine, there will be seven floors for guests' bedrooms. All rooms facing Wascana Park and the streets, will have outside private bathrooms, all rooms to the main court will have running water, and on every floor will be provided ample lavatory accommodation. There will be a total of 224 bedrooms, almost all of which can be used as double rooms on account of their large dimensions. The grill room, bar, barber shop, general toilet, main service and kitchen will be in the basement, and the laundry, stores, locker rooms, elevator machinery and refrigerator equipment in the subbasement.

In construction the exterior will be of grey brick with stone dressings and finish, the interior will be of steel frame and reinforced concrete. The typical floors of guests' rooms will be finished with hardwood doors and enamelled white trim.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

PROCEEDINGS OF NATIONAL ASSOCIATION of Railway Commissioners, Annual Meeting at Washington, 113. 612 pages, 9 by 6 ins., cloth, Law Reporting Co., 115 Broadway, New York, N.Y.

This includes all committee reports and the discussion thereon.

GREAT LAKES REGISTER. 450 pages, 8¼ by 12 ins., leather. Great Lakes Register, Rockefeller Bldg., Cleveland, Ohio, $25 a year, including supplements, by subscription.

This register, which is issued under the control of, and has been adopted by, the Lake Underwriters, as their official classification register, on which they base all rates of insurance for both hulls and cargoes, contains a full and up to date list of all steam and sailing vessels of any importance, sailing on the Great Lakes, and owned in Canada and the United States. These are arranged in a convenient manner for ready reference, and give full data of both hulls and machinery, with complete lists of owners, their addresses, and the vessels controlled by each. There are also lists of vessels, the names of which have been changed, of shipbuilders with the names, gross tonnage and date of building all vessels built by them; and also of dry docks, floating dry docks and marine railways, with their capacity and location. The information contained in the register cannot be found in any other publication, and is without doubt of great service to all interested in the lake marine.

OUTLINES OF RAILWAY ECONOMICS.—By Douglas Knoop, M.A., Lecturer on Economics in the University of Sheffield, Eng. 274 pages, 8 by 5 in. Cloth boards. Macmillan Co. of Canada: Toronto. $1.25 net.

AMERICAN RAILROAD ECONOMICS.—By A. M. Sakolski, Ph.D., Staff Lecturer in New York University School of Commerce, Accounts and Finance. 296 pages, 8 by 5 in. Cloth boards. Macmillan Co. of Canada: Toronto. $1.25 net.

These two books treat at considerable length upon the important and interesting question of railway economics. They are independent studies of the question, the first on the general subject by a British author, and the second, an analysis of the practical working of United States railways, and an attempt to lay before investors and students, such information as may assist them in forming a correct judgment of railway activities and operating results. Although written by men having different viewpoints the two books may be profitably read together.

Mr. Knoop, in the "Outlines of Railway Economics," devotes his first chapter to considering the subject matter of economics, the definition and methods of economical science, and then applies these methods to railways. In the following nineteen chapters he discusses at length all the various features and laws governing production, markets, increasing and decreasing returns, applying them specifically to railways, and illustrating his course of reasoning from the experience of British railways. The book includes a good deal of matter which would ordinarily be excluded from a work on railways, but its inclusion has the advantage of emphasizing the connection between general economics and railway economics, a connection which is too often ignored in the popular discussion of questions affecting railways. The final chapter deals with the state ownership and management of railways.

The second book, "American Railroad Economics," sets out to discuss data relating to the character of the transportation facilities; data measuring efficiency and economy of operation; data measuring revenues, expenses and net earnings, and data measuring the capital investment in relation to the corporate resources and liabilities. In other words, the author finds his material in the statistical reports issued by the railways to their shareholders and filed with the Interstate Commerce Commission. He then proceeds to show that while these tables give a vast amount of valuable information, prepared "by professional analysts and railroad statisticians" who aim "to gauge railway activities by the use of rigid standards and definite mathematical formulae," they do not form an accurate standard by which to measure one railway against another, and do not show the relative values of the capital stock as an investment. The twelve chapters into which the work is divided discuss the various data mentioned in detail, and, without laying down any definite plans by which a correct judgment in these matters can be reached, such information is given as will enable any one interested to work out plans for himself. One of the principal causes of the defects in the use of railway statistics, he points out, is the misunderstanding of the real significance of each statistical item. Lack of appreciation of the intrinsic worth of the figures presented leads to erroneous analyses and improper comparisons. Unless a statistical analysis is of some distinct value to the railway executive or manager, to the investor, or to the statesman, or to the public at large, it cannot be justified economically. In other words, each class of railway data should have an underlying purpose, and should be compiled, classified and interpreted to accord with this purpose. Chap. 8, which deals with Interstate Commerce Commission's system of railway accounts, is especially worth study.

TEXT BOOK ON RAILROAD SURVEYing.—By G. W. Pickles, C.E., and C. C. Wiley, C.E., 263 pages, 4¼ x 6¾ inches. 66 figures, 14 tables, morocco. John Wiley & Sons, Inc., N.Y., $2.50 net.

H. K. Wicksteed, B. A. Sc., M. Can. Soc. C.E., has favored us with the following: This is a little book written and compiled by two professors of Illinois University, and it bears the marks of its scholastic origin to a very large extent, but it is nevertheless one of the most satisfactory books of its kind ever published, and it is the first which considers the spiral curve in conjunction with the simple, and as an essential part of it, and it is the first we believe to be placed on the market which sets forth the true spiral as primarily a variation of the circle and to be run in the field in the same way by tangential angles, and that the relation of these angles one to another, and to the central angle, are almost as simple and easy to remember as those of the circular curve itself, although it is susceptible like the latter to being laid out when necessary under exceptional conditions by rectangular co-ordinates. A large portion of the book is given up to the discussion of this curve and its properties, and in the appendix is a demonstration of some of the theorems for those who have sufficient knowledge of the higher mathematics to follow it. The subject of overhaul in earthwork and its calculation by means of the "mass curve" or "curve of volumes" is pleasingly discussed and demonstrated, and a third departure from the older books of the same type is a short dissertation on the vertical curve which is now an essential of all first class location. It is a pity, perhaps, that while the authors have been liberal in diagrams they have not illustrated this problem by one, but have contented themselves by merely working out one suppositious case of the very simplest nature in figures. We can easily imagine an assistant engineer with a very fair knowledge of geometry being puzzled to follow the demonstration and we think, too, that the method of co-ordinates as being especially adapted to drawings on profile or cross-section paper might have been brought to great advantage as an alternative and, in some cases, a simpler method. The tables given are good and well arranged and sufficient for all ordinary surveying operations, and withal the book is quite small and portable, nearly double the thickness might be carried about without inconvenience. Under these circumstances and when the up to dateness of most of the matter is so marked and satisfactory, one is led to wonder why a little more of that found in the older pocket books is not reintroduced so as to make the little manual complete in itself. Some of the devices for running curves past an obstacle, for instance, might well have been illustrated, and a few pages might have been devoted to astronomical determination of the meridian and of the latitude and to the adjustment of instruments, etc. One striking feature which is hardly modern is the amount of pains and space given to the calculation of the long chord of the curve and the ordinates from it, while no notice is taken of the "tangential" method of running in curves, which is becoming more and more general on Canadian roads as a time saver. Only three or four pages out of 120 are devoted to a discussion of questions of "economics" of location. What is said is good, and generally well said, but it would seem a pity that a few general data should not have been given to enable a locating engineer to estimate even roughly the value of reducing or eliminating a grade or a series of curves. To sum up the criticism in a few words, it may be said that so much is better put than it has ever been put before, and so much is new in form at least, that we should like to see the scope of the book expanded so as to include the best of what has been said before and to cover so far as a pocket book may the subject of which it treats.

Lackawanna Passenger Terminal at Buffalo.—Ground has heen broken for the new passenger terminal of the Delaware, Lackawanna & Western Rd. at Buffalo, N.Y. The station will be across Main St. from the present one, between Ohio St. and Buffalo River. In order to give the necessary width, Ohio St. will be moved north for several blocks, half its width most of the way, but about 120 ft. at Main St. There will be six elevated stub tracks, covered by a trainshed. These tracks will terminate at the east line of Washington St., the space between there and Main St. being occupied by the head house. A seventh elevated track will pass the station on the north and reach the docks beyond the present station. There will also be a track across Main St. at grade to accommodate the freight house. Underneath the new station will be a warehouse; this will be served by one track at the low level, the design ultimately allowing for three tracks. More than 1,000 ft. of the station layout will hear directly on the bulkhead wall along the river. Except in two or three places where complications will require special piers, this wall, which will be mass concrete, will he carried on piles.

About 135,000,000 railway ties are used each year in the United States.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—It was expected to have the right of way from the junction with the Edmonton, Dunvegan and British Columbia Ry. to Lac la Biche, Alta., cleared by April 30. Grading is to be pushed as fast as possible, and track is expected to be laid to Lac la Biche by the end of the year. J. D. McArthur, Winnipeg, is the contractor, and W. R. Smith, Edmonton, Alta., is Chief Engineer.

The route map for the first 125 miles of the line shows that it will run almost entirely through an agricultural country. The line starts from the Edmonton, Dunvegan and British Columbia Ry. about two miles north of the Sturgeon River, and passes through or near Excelsior, Bon Accord, Battenburg, Fedorah, Staybridge and Egremont, on to tp. 26, range 24, about six miles south of Flat Lake, and then on to the south of Big Egg Lake. (April, pg. 165.)

Bruce Peninsula Ry.—In passing through the House of Commons the bill to incorporate this company was amended by striking out the section giving authority to develop and transmit electric power. (April, pg. 165.)

Burrard Inlet Tunnel and Bridge Co.—The Dominion Parliament has extended the time for the construction of the proposed bridge, tunnel and railway at the second narrows of Burrard Inlet, Vancouver, B.C.

Tenders were opened April 1, for the construction of the proposed bridge. Contractors were asked to submit prices for substructure and superstructure separately, on the plans prepared by Sir J. W. Barry. Consulting Engineer, London, Eng., and approved by the Dominion Government. The tenders were:—Missouri Valley Bridge Co., Kansas City, Mo., substructure, $923,484. Armstrong and Morrison, Vancouver, substructure, $1,376,173. Dominion Bridge Co., Montreal, superstructure, $1,453,047. Canadian Bridge Co., Walkerville, Ont., superstructure, $1,519,615. Sir William Arroll, Glasgow, Scotland, per Armstrong and Morrison, superstructure, $1,626,635. Cleveland Bridge and Engineering Co., Darlington, Eng., superstructure, $2,122,062. Alternative plans and tenders were submitted as follows:—Armstrong and Morrison and the Dominion Bridge Co., substructure, $1,110,656; superstructure, $1,177,135. Armstrong and Morrison and Dominion Bridge Co., substructure, $1,080,700; superstructure, $1,097,544. Western Foundations Co., Toronto, substructure, $825,997; superstructure, $904,169. Metropolitan Tunnel and Public Works Co., London, Eng., superstructure, $2,276,300. (Mar., pg. 121.)

Calgary and Fernie Ry.—Vancouver, B.C., press reports state that five engineering parties have been placed in the field to locate this projected line from Calgary, Alta., into the Crowsnest Pass coalfield. The parties are said to total 80 men, and to be working under the general direction of Du Cane, Dutcher & Co., Vancouver. Mr. Du Cane is a son-in-law of one of the partners in Childs Bank, London, Eng., and has recently been over the route along with A. H. Barry, an English engineer associated with Sir John Wolfe-Barry, who designed the projected bridge across the second narrows of Burrard Inlet. It is stated that surveys have reached such a stage that Government approval will be asked for the plans, and a contract let for construction at an early date.

The Dominion Parliament has extended the time for construction; changed the head office from Fernie, B.C., to Calgary, Alta.; and increased the bonding powers from $20,000 to $50,000 a mile. (April, pg. 165.)

Central Canada Ry.—Plans for this railway, to start from the Edmonton, Dunvegan and British Columbia Ry. at Round Lake, and proceed along the valley of the North Hart River to Peace River Crossing, Alta., have been filed with the Alberta Government. It is estimated that 50,000 yds. of earth per mile will have to be moved, and that many bridges will have to be built. On one section of 18 miles the plans show that 60 steel bridges of from 75 to 125 ft. spans will be required. In the last 18 miles to Peace River Crossing the line will drop 700 ft. A steel bridge will have to be built at Peace River Crossing at an estimated cost of $400,000. Surveys along the north bank of the Upper Peace River to Dunvegan are being made. J. D. McArthur, Winnipeg, who is also associated with the Edmonton, Dunvegan and British Columbia Ry. and the Alberta and Great Waterways Ry., is one of the provisional directors. (Mar., pg. 121.)

Central Western Canada Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Winnipeg in a generally northwesterly direction, via Yorkton, Saskatoon and Battleford to Edmonton, Alta. (Mar., pg. 121.)

Chicago, Milwaukee and St. Paul Ry.-Chicago, Milwaukee and Puget Sound Ry.—F. Williams, the former company's right of way agent, has been in the district south of Vancouver recently, and press reports state that he has secured a right of way south of the International Boundary, which will link up the company's lines with the British Columbia Electric Ry. near Sumas. The company's engineers are reported to be making surveys for an independent line from near Sumas to Vancouver. It is stated that construction on the line to Sumas will be started this year. (Mar., pg. 121.)

Cornwall and Hawkesbury Ry.—Application is being made to the Dominion Parliament to incorporate a company with this title to build a railway from Cornwall, via Martintown, Alexandria, to Hawkesbury, Ont., thence to a conection with the C.P.R. at Grenville or Calumet, Que., about 50 miles. Pringle, Thompson, Burgess and Cote, Ottawa, solicitors for applicants.

Dominion Atlantic Ry.—The Dominion Parliament has extended the time within which the company may build the line from between Kentville and Canning, on its Cornwallis Branch, to the main line between Berwick and Middleton, N.S. (Feb., pg. 69.)

Edmonton, Dunvegan and British Columbia Ry.—Track laying has been completed beyond Sawridge, Alta., at the southeastern end of Lesser Slave Lake, and a freight service has been placed in operation from Edmonton. Progress is being made with the erection of a bridge across the Athabasca River at Smith, five miles beyond Sawridge. Eighty-five per cent. of the substructure has been completed, and a large quantity of steel for the superstructure has been delivered on the site. The station and other buildings at Smith are reported to be nearing completion. Considerable grading has been done beyond Smith, and it is expected that track will be laid as far as Big Smoky River by Dec. 31. W. R. Smith, Edmonton, Alta., is Chief Engineer. (April, pg. 165.)

Esquimalt and Nanaimo Ry.—The Dominion Parliament has granted an extension of time for the completion of the following lines:—From Comox to Campbell River, B. C.; any branches to the east coast of Vancouver Island authorized in general terms by sec. 9, chap. 14 of the statutes of British Columbia, 1884; a branch from Comox southwesterly to the Alberni Canal; a line from Oyster Bay to Hardy Bay.

It is expected to complete the extension of the line from McBride Jct. to Comox, 44 miles, by July 1. Track had been laid to Sable River, Mar. 27, when R. Marpole, Vice President, made a trip of inspection over the line, and the other work through to Comox was found to be well advanced.

On the line to Nanaimo, considerable ballasting is being done near Table River, where a new steel bridge is to be erected. The Canadian Bridge Co. is getting in the necessary materials. (Dec., 1913, pg. 573.)

Glengarry and Stormont Ry.—The Board of Railway Commissioners has approved several deviations from the original plans for this line from a connection with the C. P.R. at St. Polycarpe, Que., to mileage 4.96; and from mileage 15.05 to Cornwall, Ont., mileage 27. (Feb., pg. 69.)

A press report April 22 stated that contracts have been let for the construction of this line as follows: G. R. Phillips, from north of the G. T. R. tracks, near Cornwall Station, to Glen Donald, 4 miles; the company proposes to build the next section itself; McDonald and Grant, from near Williamstown for 4 miles; A. C. Mulhern, next section easterly; A. C. McArthur, from C. P. R. at St. Polycarpe, Que., westerly to connect with the Mulhern contract. It is stated that the contracts call for the rapid completion of the work, and that it is hoped to have track laid by Nov. 1.

Intercolonial Ry.—The acting Minister of Railways stated in the House of Commons, April 1, that an engineering staff in charge of H. S. Clark is making surveys on the line near Dorchester and Sackville, N.B., with a view of securing improved gradients and curvature, and for the laying of a second track.

We are officially advised that the surveys being made on the line between Point Tupper and Sydney are simply the continuation of the grade revision surveys which were started in 1913. Several parties of engineers are in the field in connection with this work.

The Dominion Parliament has voted the following amounts for betterments:—

Amherst, additional facilities	$2,666.67
Aston Jct., interlocking tower	1,666.67
Chatham, diversion of line, etc.	1,666.67
Chaudiere Jct. to St. Romuald second track	26,666.67
Nelson to Derby Jct. diversion	18,000.00
North Sydney-Leitches Creek diversion	26,666.66
Fredericton, increased accommodation	1,666.67
Halifax, docks and wharves	26,666.67
Halifax, new terminal facilities	416,666,66
Halifax, increased accommodation	3,583.33
Halifax, Willow Park yard service	2,500.00
Hampton, subway, etc.	6,666.66
Moncton, level crossing elimination	16,666.66
Moncton, new roofing	4,166.66
Mulgrave, new car ferry and dock	76,333.33
Point Tupper, improvements	5,000.00
Pugwash, spur line	4,666.66
Riviere du Loup, additional facilities	12,933.24
St. Flavie, increased accommodation	3,166.67
St. John, spur line	22,333.33
St. John, increased accommodation	550.00
Sussex, improvements	4,666.67
Sydney Mines, diversion	4,166.67
Truro, increased accommodation	16,666.66
New railway, Halifax to Dean's Settlement, further on account	141,666.67
Original construction	133.34
Increased water supply	4,500.00
Increased facilities generally	33,333.33
Surveys and inspections	8,333.34
Equipment of car shops, Moncton	6,000.00
Telephone operating system	10,666.66
Block system installation	16,666.67
Power plants, increase of	3,333.34
Protection of highways, general	5,500.00
Anti creepers and tie plates	5,333.34

Interprovincial Ry.—We are officially advised that the temporary officers and directors of the company are:—President, L. N. Asselin; Secretary, E. Letendre; Directors:—J. Theberge, L. Tache, A. Raymond, O. A. Talbot, all of Rimouski, Que. Provincial Securities, Limited, Quebec, of which R. Dupont, formerly with the Canada and Gulf Terminal Ry., is Managing Director, is interested in the project. A preliminary survey of the route from Rimouski, Que., to Edmundston, N.B., is being arranged for. (See Rimouski International Ry., April, pg. 166.)

Joliette and Lake Manuan Colonization Ry.—The Dominion Parliament has extended the time for the building of this projected railway from Joliette to the National Transcontinental Ry., and from Joliette to Montreal. (Jan., pg. 21.)

Kettle Valley Lines.—It is expected that track laying will be completed on the unfinished sections, between Midway and Penticton, by June 30. Satisfactory progress is being made with construction on the line west of Penticton, and it is expected to have Penticton and Spence's Bridge linked up by the end of the year.

Construction has been started on the section of the line from Osprey Lake to Princeton, 32 miles, the deviation into the latter place having been authorized last session by the British Columbia Legislature. We are officially advised that the contract for this section has been let to Guthrie, McDougall & Co. The contract calls for the completion of the work by Oct. 1. This is the last section of the entire line from Midway to Hope to be put under construction. When constructed, with the joint section arranged with the Vancouver, Victoria and Eastern Ry. from Princeton to near Otter Creek, it will give a through line between the points named, with a branch from Coldwater Jct., to Merritt, 25 miles.

The section from the Coquihalla Summit, near Otter Creek, to Hope, will be operated jointly with the V. V. and E. Ry., under an agreement. About 25% of the grading on this section is reported to have been completed.

At Hope a bridge over the Fraser River is under construction to give connection with the C.P.R. It was reported April 10, that two of the piers for the substructure have been completed, and the construction of the other piers and abutments is well advanced. The Canadian Bridge Co. is assembling the material for the superstructure

We are officially advised that it is expected to have steel laid on the uncompleted portions of the entire line from Midway to Hope, by Dec. 31. (April, pg. 165.)

Lake Erie and Northern Ry.—An act has been passed by the Dominion Parliament enabling the company to increase its bonding power from $30,000 to $45,000 a mile, and to issue other securities for the purpose of developing properties along its line, but these extended powers are not to be used until every municipality which has aided the company, has been released from its agreement.

Track laying was reported to have reached Brantford, from Galt, Ont., April 9, and ballasting has been started, a train working each way from the pit at Paris.

Construction is being proceeded with on the Brantford-Port Dover section, and it is expected that track laying will be started in both directions from Simcoe, as soon as work on the Brantford-Galt section is completed. The line is not expected to be ready for operation until the end of the year. (April, pg. 166.)

London, Grand Bend and Stratford Ry.—The Ontario Legislature has incorporated a company with this title to build a railway to be operated by electricity or any other motive power, from London to Lake Huron at the boundary between Lambton and Huron counties, thence to Stratford and London, Ont., with branches as may be deemed necessary. The company is given authority to generate electrical power and to distribute the surplus in the municipalities along its route. The authorized capital is $2,000,000 with a bonding power of $35,000 a mile of line. The provisional directors are:—W. R. Willard, G. H. Gray. J. J. Gray. (Dec., 1913, pg. 593.)

Miramichi Bay Shore Ry.—The New Brunswick Legislature has under consideration a bill to incorporate a company to build a railway to serve Newcastle, Chatham and other places on the shores of Miramichi Bay.

Moncton and Buctouche Ry.—The bridge at Scotch Settlement, which was wrecked recently, has been reconstructed, and the line beyond that point has been cleared. The train service has been restored. Negotiations are in progress with the Intercolonial Ry. management for permission to switch the company's trains on the I.R.C., near Humphrey's Mills, and run them to and from Moncton station, instead of to and from the M. and B. station on Harper St., Moncton. (See Moncton and Northumberland Strait Ry., Jan., pg. 21.)

Newfoundland Railway and Train-Ferry Syndicate.—An act has been passed by the Newfoundland Legislature incorporating a company with this title to build a railway from Rantem or from any other suitable point on Trinity Bay, across the Isthmus of Avalon to Little Southern Harbor, or any other suitable point on Placentia Bay, with the right to put in a train ferry slip at Burin, and to build a railway from Humbermouth on the Bay of Islands, to South West Arm, on Green Bay, with a branch line to White Bay. The Isthmus of Avalon line is to commence within three years, and the line to Green Bay within five years from the completion of the Isthmus of Avalon railway. The company is entitled to two square miles of land at each of the sea frontages of its several terminals, the price of the same to be fixed by arbitration; it is authorized to take material for construction purposes on Government land, when it cannot be obtained on the right of way granted. The company may operate a train ferry to connect the two sections of its line, and other train ferry services to Louisburg, N. S., and to Gaspe, Que., or to other suitable ports. H. C. Thompson, St. John's, Nfld., is solicitor for the syndicate, the names of the members of which have not been disclosed.

Norfolk and Elgin Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Simcoe to Port Burwell, Ont., and to operoperate a car ferry across Lake Erie. (April, pg. 166.)

North Shore Power, Ry. and Navigation Co.—Application is being made to the Dominion Parliament for an act authorizing the company to carry on its business and undertaking without the limits of Canada, and to change its title to that of the Gulf Pulp and Paper Co. Christie, Greene and Hill, Ottawa, solicitors for company.

Ottawa and Ungava Ry.—An extension of time for the building of this projected railway, as authorized by chap. 102 of the statutes of 1909-10, and by chap. 94 of the statutes of 1912, has been granted by the Dominion Parliament. Power has also been given to build a branch line with various spur lines. (Dec., 1913, pg. 574.)

Pacific, Peace River and Athabasca Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from Naas River, on the Pacific Coast, to Prince Albert, Sask., by a route described in a former issue. (Mar., pg. 121.)

Pacific and Hudson Bay Ry.—The Board of Railway Commissioners has approved location plans for this projected railway from Bella Coola, easterly to Hagensborg, B.C., 10.00 miles. (Jan., pg. 22.)

Pacific Great Eastern Ry.—The first portion of the line, viz.: from Vancouver to Fort George, B. C., has been under construction for nearly two years, and two sections are in operation. The first is from North Vancouver to Dundarave, 4.5 miles, and the second is from Squamish, the new name given to Newport, to Cheakamus, 13 miles, which includes the seven miles of track laid by the old Howe Sound and Northern Ry. The recent decision of the British Columbia Legislature to extend the line from Fort George to the Peace River country and to have the extension ready to handle traffic through to the Alberta boundary in 1916, has apparently given a great impetus to construction. It has been announced that 10,000 men will be distributed along the line between Vancouver and Fort George. The construction is well advanced to Kelly Lake, 200 miles from Vancouver, and we are officially advised that contracts have been let for the line southerly from Fort George, to Kelly Lake, to H. E. Carleton & Co., 25 miles; A. E. Griffin & Co., 25 miles; and Burns, Jordan & Co., 50 miles. These contractors have just completed subcontracts on the G. T. Pacific Ry. west of Fort George, and it was reported, April 3, that their outfits were being transferred to the P. G. E. route. The points between which these contractors will work had not been decided at the date of our advice. The construction on the 280 miles between Kelly Lake and Fort George is reported to be light. The main points on the route with distances from Vancouver are:—Squamish, 43 miles; Pemberton Meadows, 100 miles; Lillooet, 163 miles; Clinton, 210 miles; Lac la Hache, 285 miles; Quesnel, 395 miles; Fort George, 480 miles.

In connection with the extension of the line from Fort George to the Peace River Valley, where a junction would be made with the Edmonton, Dunvegan and British Columbia Ry., preliminary surveys have been completed, and locating parties are going over the 330 miles of the route. The location for some miles out of Fort George has been settled, and it is expected that contracts for grading the first 100 miles will be let at once. The line will start at the confluence of the Salmon and Fraser rivers, following the first named to Summit Lake, thence along the Crooked River valley to Fort McLeod, and McLeod Lake, thence along the Missinchurka River through Pine Pass and along the Pine River to Hudson's Hope, following the Peace River to the Alberta boundary. The distance from Fort George to Pine River Pass is 142 miles, and from Fort George to the Alberta boundary, 330 miles.

In preparation for the construction of docks for ocean going vessels and railroad terminals at Squamish, which is the point in Howe Sound where the line leaves tidewater, the company is reclaiming a tract of land about a mile long. Foreshore rights along the waterfront were recently granted to the railway company by the Dominion Government, conditional on the expenditure by the company of $2,000,000 in improving the harbor. The dredging and refilling to be carried out this year at Squamish are to cost about $200,000. (April, pg. 166.)

Peace River Ry.—The Dominion Parliament is being asked to incorporate a com-

pany with this title to build a railway from Grand Prairie to Fort Vermilion, Alta. Griesbach, O'Connor & Co., Ottawa, solicitors for applicants.

Prince Albert to Upper Beaver River.—Press reports from Prince Albert, Sask., state that a preliminary survey has been made by R. T. Gough for a railway from Prince Albert to the Upper Beaver River and thence to the provincial boundary, about 250 miles.

Prince Edward Island Ry.—The Dominion Parliament has voted the following sums for work on this line:—Original construction, $166.67; to increase accommodation and facilities, $866.66; on account of car ferries, terminals and connections, $250,000. (Feb., pg. 70.)

Quinze and Blanche River Ry.—The Dominion Parliament has extended the time for the building of the line as provided in sec. 8, chap. 123, of the statutes of 1907. The company has power, subject to the consent of municipalities, to erect lines for the distribution of electric power which it may generate (Jan., pg. 22.)

Reid Newfoundland Co.—The Premier of Newfoundland was in London, Eng., recently for the purpose of raising a loan of $2,000,000 to complete the government's railway plans. The agreement with the Reid Newfoundland Co. provided for the building of six branch lines, aggregating about 400 miles. Several of these have been completed, and the others are under construction. It is expected that in all 250 miles will be completed by Dec. 31, leaving 120 miles to be completed in 1915. The proceeds of the loan will be utilized to pay the government subsidy on the lines under construction. (Mar., pg. 122.)

Salmon Harbor Coal Co.—We are officially advised that the company has no railways constructed. There was formerly a spur line of about three miles, connecting the mines at Salmon Harbor, N. S., with the New Brunswick Coal and Ry. Co.'s line near Midland, but the rails were removed before the present company obtained possession of the property. The company has not reached any definite decision as to the reconstruction of this spur, or as to building any other line. The officers of the company are: President, G. Sargeant, New York; Treasurer, W. E. Conklin, New York; Secretary, W F. Williams, New York; Manager, M. B. Davis, Salmon Harbor, N. S.

The St. Francis Valley Ry. Co. is the present title of a company incorporated by the Quebec Legislature under the title of the L'Avenir and Melbourne Ry., to build a line from Richmond or Melbourne to Drummondville, Que. We have been advised that this projected railway will start from near Drummondville, Que., and will follow the St. Francis River to Richmond, and thence continue south of Sherbrooke to the International Boundary line near Stanstead.

Press reports stated recently that in building the line the old C. P. R. line between L'Avenir and Melbourne will be used. We are advised that this piece of line was abandoned about 20 years ago. C. B. Hibbard, Montreal, is Vice President. (See L'Avenir and Melbourne Ry., Jan., 1913, pg. 83.)

St. John and Quebec Ry.—A bill is under consideration in the New Brunswick Legislature providing for the granting of further aid for the St. John Valley Ry., which is the portion of this proposed line being built in New Brunswick. The estimated cost of the three sections of the line under construction was stated by the Premier to be $4,366,275. The total expended up to Nov. 30, 1913, was $3,542,275, and it is estimated that $757,080 more will be required to complete the work. The Province guaranteed the company's securities to the amount of $25,000 a mile, but the company was unable to find a market for the unguaranteed securities, and is therefore obliged to seek further assistance. The Government had the option of taking over the uncompleted line under section 5 of the contract and complete it as a public work, but it was decided, the Premier explained, in introducing the bill, April 8, that it would be more economical for the Legislature to give further assistance. The Government proposed that the Province guarantee a further issue of bonds to the amount of $10,000 a mile, varying the amount of guarantee from $8,000 a mile on the Centreville-Gagetown section, to larger amounts on the other sections, the whole not to exceed $10,000 a mile on the whole line. $1,500 a mile was reserved for the payment of interest, and it is proposed to increase this by the setting aside of $1,000 a mile additional out of the new issue.

The Government has no intention of departing from the route of the line originally laid down, viz.; to provide a line from Grand Falls to St. John. It was suggested that the line from Gagetown be diverted so as to join the C. P. R. at Westfield. The Government, however, has no intention of so diverting it. The question of the bridge construction is an important one. It was anticipated that $1,260,000 would have been sufficient to build the three bridges required, but it was a matter of surprise when the estimate of $2,000,000 for the building of the bridge at Dunham's Wharf was submitted. However, a delegation waited on the Dominion Government and was assured that that Government will increase its undertaking to finance the building of these bridges up to $3,000,000 and will meet the interest on that amount for 15 years.

An allegation was made in the House that the contractors for the railway had been compelled to pay large sums of money to members of the New Brunswick Government before they got their contracts, and it was asked that a committee be appointed to investigate the matter. (April, pg. 166.)

Thessalon and Northern Ry.—An extension of line has been granted by the Dominion Parliament for the building of the projected line from Thessalon Station, on the C. P. R. Algoma branch, to Thessalon town, and from Thessalon Station thence northerly to the Mississauga River in Gould tp. The section of the line into Thessalon has been built and is being operated by the C. P. R. (Nov., 1909, pg. 831.)

Timiskaming and Northern Ontario Ry.—We are officially advised that the plans for the electrification of branch lines are not yet completed to the extent that any information as to what may be done can be given.

We are further officially advised that a survey party under W. R. Maher, has left Cochrane for Moose Factory, Ont., to continue the investigations carried on during the past couple of years, as to the route for a line to that point, and the possibilities of harbor development at Moose Factory. The scope of the investigations was outlined in an address recently delivered before the Toronto branch of the Canadian Society of Civil Engineers by J. G. G. Kerry, Consulting Engineer to tbe Commission. (Mar., pg. 122.)

The Minister of the Interior gave notice in the Dominion Parliament, April 15, of a resolution providing for the transfer to the Province of Ontario of such portion of the Crown Lands now controlled by the Dominion Government in the Province of Manitoba, where such lands are necessary to make provision for the extension of the T. and N. O. Ry. to Port Nelson.

Toronto, Hamilton and Buffalo Ry.—Press reports state that arrangements are being made for largely increasing the company's yard accommodation at Brantford, Ont. (Mar., pg. 122.)

Toronto Terminals Ry.—Application is being made to the Dominion Parliament for power to increase the capital from $10,000,000 to $12,000,000.

The directors finally approved of the plans for the new union station in Toronto, April 6, and application was made for the approval of the Board of Railway Commissioners, at the sittings held in Toronto, April 24. It is said that tenders will be called for at once for the buildings. J. R. W. Ambrose is Chief Engineer. (April, pg. 166.)

Winnipeg.—The railway which is about to be built by the Greater Winnipeg Water District, will start from where the aqueduct will cross the Grand Trunk Pacific Ry. east of the Red River, and will extend to Indian Bay on Shoal Lake, a part of the Lake of the Woods, 85 miles. The first 16 miles will be built across the prairie on a location about six miles from the G. T. P. Ry. The rest of the country is largely rock and muskeg, but is not heavy. The grade for the entire 85 miles will not exceed 300 ft. The right of way which is being provided for railway and aqueduct, runs from 250 to 300 ft. wide, and is being cleared. Ties and other lumber for the work are being provided either from the right of way or from the adjoining territory. The construction of the railway is being pushed ahead rapidly, as it is desired to have it practically completed this year. (April, pg. 167.)

Railway Lands Patented.—Letters patent were issued during February, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary and Edmonton Ry.	2,874.55
Canadian Northern Alberta Ry.	4.01
Canadian Northern Ry.	693.495
Canadian Pacific Ry.	340.544
Manitoba Southwestern Colonization Ry.	23.69
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	1,758.00
Total	5,694.289

G. T. R. Apprentices' Annual Dinner. The second annual dinner of the apprentices of the Motive Power Departmet was held at the Windsor Hotel, Montreal, Apr. 9. W. D. Robb, Superintendent of Motive Power, occupied the chair, and speeches were made by W. McNab, Principal Assistant Engineer, A. A. Maver, Master Mechanic, Montreal, and R. Patterson, Master Mechanic, Stratford, Ont.

The British Columbia Minister of Railways has ordered that the regulations set forth in the Dominion Board of Railway Commissioners' general order 102 with respect to railway safety appliances standards, shall be adopted by the B. C. Department of Railways in respect of all railways operated under special acts of the B.C. Legislature, and incoroprated under the Railways Act.

Railway Route Maps Approved.—The acting Minister of Railways approved of the following route maps, Apr. 1,—Calgary and Fernie Ry.,—from Fernie to Kananaskis Pass, about 83 miles; and Pointe aux Trembles Terminal Ry.,—from Montreal Harbor Commissioners' boundary, Pointe aux Trembles Parish, to Canada Cement Co.'s mill, about 1.5 miles.

G. T. R. Coal Rates. The Interstate Commerce Commission has suspended from May 1, to July 30, the G. T. R. tariff increasing rates on coal in carloads from interstate points to certain points on the Chicago and North Western Ry., in the Chicago switching district.

The Death of Sir William Whyte.

The death of Sir William Whyte, which occurred at the Hotel Del Coronado, San Diego, California, April 14, was a great shock even to his intimate friends, who though they knew he was ill, had no apprehension of a fatal result. The public manifestation of regret, not only in the vast territory between Lake Superior and the Pacific Coast, which owes so much of its development to his foresight and great ability, but throughout Canada, is a remarkable tribute to the character of the man, who is referred to by the Manitoba Free Press as "the most distinguished private citizen of Western Canada." The writer of this article, whose intimate acquaintance with Western Canada dates back to 1879, has never before witnessed such widespread feeling of sorrow and has no hesitation in saying that no death since the inception of that vast territory has been so widely regretted. Flags were half masted through the whole territory from Port Arthur to Vancouver and the entire press bore tribute to the great loss sustained.

William Whyte was born at Charleston, Fifeshire, Scotland, Sept. 15, 1843. He commenced his railway career with the West of Fife Ry., May, 1862, and after about two years service, came to Canada, July, 1863, after which his record was as follows:—To Apr., 1864, brakeman, G.T.R., Cobourg, Ont.; Apr., 1864 to 1866, freight clerk, G. T.R., Cobourg, Ont.; 1866, freight clerk, G.T.R., Toronto; 1866 to 1867, foreman, Freight Department, G.T. R., Toronto; 1867 to 1868, yardmaster, G.T.R., Toronto; 1868 to 1870, conductor, G.T.R.; 1870, night station master, G.T.R., Toronto; 1870 to 1874, station agent, G.T.R., Stratford, Ont.; 1874 to 1880, station master and Freight and Passenger Agent, G.T.R., London, Ont.; 1880, Freight Agent, G.T.R., Toronto; 1880 to Apr., 1883, Division Superintendent, G.T.R., Toronto. Apr. to Oct., 1883, General Superintendent, Credit Valley Ry., Toronto; Oct., 1883, to May, 1884, General Superintendent, Ontario and Quebec Ry., which included the Credit Valley Ry., and the Toronto, Grey and Bruce Ry., Toronto; May 1, 1884, to May 1, 1885, General Superintendent, Ontario Division, C.P.R., embracing all lines in Ontario west of Smith's Falls Jct., Ont.; May 1, 1885, to Oct. 1, 1886, General Superintendent, Eastern and Ontario Divisions, C.P.R. He went to Winnipeg in October, 1886, as General Superintendent of the then Western Division, in charge of all lines between Lake Superior and British Columbia's eastern boundary. On May 3, 1897, he was made Manager of all lines west of Fort William to the Pacific Coast, and in 1901 was appointed Assistant to the President. In Dec., 1903 came the crowning point in his career, when he was appointed Second Vice President, in general charge of the maintenance and operation of the Western Lines, and, under the President's direction, of the administration of the company's affairs in the territory between Lake Superior and the Pacific Coast. Never has any other railway appointment in Canada been so popularly acclaimed. The people and the press throughout the west unanimously gave expression to the general feeling of satisfaction and a new era of relations between the company and the western public was inaugurated. In June, 1910, when the numerical designations of the Vice Presidents were abolished he became Vice President, retaining the same jurisdiction as before. In June, 1911, he was knighted, and in Sept., 1911 he retired from active service and was elected a director of the company.

He was married in Toronto in 1871 to Miss Jane Scott, who survives him, as well as his only son William, and four daughters, Mrs. J. F. Fisher, Winnipeg; Mrs. C. Meek, Vancouver; Mrs. J. A. Hunter, Minneapolis, and Miss Gladys Whyte.

Under ordinary circumstances Sir William would have retired from the C.P.R. service in 1908, when he attained 65 years of age, but as Sir Thomas Shaughnessy stated in announcing the retirement at a dinner in Winnipeg in Sept., 1911, he personally solicited Sir William to remain in office for a few years longer. In the years that elapsed prior to Sir William's retirement in 1911 when he was elected a director of the company, the wisdom of the C.P.R. directorate in placing him at the head of its western affairs became plainer day by day. He administered its great interests with conspicuous ability and unwearying devotion, and while maintaining the company's position carried the public with him, by his absolute candor and fairness. The public confidence in his integrity was a most valuable asset to the company and enabled him to carry through many negotiations in a manner that very few indeed, if any other, men could have done. A notable instance of how he could maintain the company's position without alienating public opinion occurred in the eighties, when the Northern Pacific Rd., backed by the Manitoba Government, the Winnipeg Board of Trade, and in fact the citizens generally, attempted to lay a track across the C.P.R. in the Fort Rouge suburb of Winnipeg. Mr. Whyte having been apprised of what was to be attempted, was on the spot with a small army of men, before the N.P.R. forces arrived. He effectually prevented the laying of the crossing, for which there was no legal authority, but so judiciously handled the delicate situation that he made no enemies for himself or the company. The historic name, Fort Whyte, will ever be a reminder of this memorable incident, when most serious trouble might easily have occurred had the protection of the company's interests been in the hands of a less diplomatic man.

As was remarked in Canadian Railway and Marine World in Oct., 1911, his withdrawal from active railway work was an event of really national importance, and the announcement was received with deep regret, not only throughout the vast territory of empire extent west of Lake Superior, where he had general charge of all the company's great interests, but in every part of Canada, his name being a household word from the Atlantic to the Pacific. Among the other officers and the employes of the Western Lines there was the deepest regret at the severance of the tie with their chief of so many years. Absolutely fair in every respect, Sir William was looked on as the friend of everyone on the pay roll and everyone knew that he could always get a patient and fair hearing and that he would not be the victim of any injustice or hasty action.

P234 Sir William Whyte.

The history of Sir William's administration of the vast territory under his jurisdiction is practically the history of its general development and expansion. From a comparatively small mileage, he saw the company's lines west of Lake Superior grow many times over, until the Western Lines alone have to-day more mileage than many of the more important systems on this continent. Most of the mileage was constructed on his initiative and recommendation, in which and many other respects he took a foremost position as a great empire builder.

Last year Sir William intended going on a trip round the world, but was prevented by indisposition from which he apparently recovered. When he left Winnipeg early in February he was suffering from pyelitis, but it was believed that the change to California would restore him to health. He enjoyed golf and motoring there to some extent, but complications set in and at times he suffered acutely but he was apparently getting better and up to a couple of days before his death wrote letters to some of his intimate friends, in fact the attending physician stated that on the morning of his death there was nothing to indicate that it was so near, though he had had no hope for some weeks that Sir William would recover. Lady Whyte and his youngest daughter, Gladys, were with him when he died. His only son, William, left Winnipeg immediately, on being advised of his father's death, and Sir William's private Secretary, P. J. Boyce, also went to meet the body, which was taken to Winnipeg via Omaha in a special car.

The funeral at Winnipeg on April 22 was the occasion of a great demonstration of the public's grief. The body lay in state in Knox church, which was visited by vast throngs. A private service was held at the house and a public one at Knox church, the coffin being carried by representatives of the locomotive drivers, locomotive firemen, conductors, trainmen, machinists, mainten-

ance of way men from the C.P.R., and inspectors and conductors from the Winnipeg Electric Ry. The pallbearers were Sir Daniel McMillan, Geo. Bury, N. G. Leslie, A. M. Nanton, J. A. M. Aikins, J. T. Gordon, D. K. Elliott, G. R. Crowe, K. McKenzie, James Fisher. Business in Winnipeg was practically suspended during the funeral, and the streets were lined with parallel rows of people who evidently felt that they had lost a friend. From 3.15 to 3.18 p.m. all trains on the C.P.R.'s western lines and the Winnipeg Electric Ry.'s cars were stopped. Sir Thomas Shaughnessy, President, C.P.R., went from Montreal, and there were a large number of the western cities from Fort William to the coast officially represented by their mayors. Railway officials from the C.P.R. lines and also from the other roads were present in scores, while among the mourners were hundreds of the railroad rank and file.

Winnipeg Press Comments.

Following are extracts from the three Winnipeg daily papers, which are indicative of the expressions of the western press generally:

Winnipeg Free Press:—"It is a simple matter of fact that everyone who came in contact with him—and during the past quarter of a century and more there has been no man in Western Canada with whom a greater number came in contact—regarded him with respect, which was of a quite remarkable quality in its blending of confidence, and admiration and strong personal liking. His was a personality that attracted liking and confidence. He was a big man, in every sense of the word—a man of big bodily frame, of big mind and of big heart. No man has ever been better known throughout the West, and better liked. * * * He will live long in the remembrance of the West as a true man, behind whose dignity of manner there was a genuine, kindly spirit that put all sorts and conditions of people in the mood of frank, straightforward speech. His growing power as a man of affairs in the world never altered in the least the simplicity of his nature or of his relations with his friends or his feeling about the values of life."

Winnipeg Telegram:—"In the philosophy of worth-while people Sir William Whyte attained a high position. In the world of finance his striking personality was a factor and his busy life led him into many channels which make for the progress of the country. He acquired commanding prominence as the directing genius of the great railway with which he was connected west of the lakes. * * * There can be no greater tribute to his fine qualities than the sincere respect with which he has so long been regarded among the humblest of the men with whom he was so long associated in his lifework. A man of singularly pleasing address, a large grasp of affairs, his energetic career embodies, in the best sense, the spirit of the west. * * * He will be mourned by thousands as one of those strong characters whose charming personality and considerate disposition invited general confidence."

Winnipeg Tribune:—"It falls to the lot of very few men, and especially men of prominence, to enjoy in such a universal degree the sincere respect and affection of the public as was possessed by Sir William Whyte, whose somewhat untimely end has created such a shock to the community and left such a void in its social and business life. The Tribune, which has known Sir William intimately for nearly 35 years, can truthfully say that it knows of not one single enemy he has ever made, and it has never in that long stretch of years heard an unkind or unfriendly word said about the man, who, in connection with the active railway life of the country, enjoyed such a commanding position and participated so largely in the development and upbuilding of the Canadian West."

A Letter from Sir William Whyte.

When Sir William retired from active service, in 1911, the Managing Director of Canadian Railway and Marine World wrote him expressing thanks for courtesies and kindnesses extending over a long period of years, and received in reply a letter from Sir William, which said in part:—

"I assure you that it has always been a pleasure to me to be able to assist you in building up a magazine that is now a standard of excellence in its get up, and correctness in the valuable information it disseminates. I have always valued your friendship since I first had the pleasure of becoming acquainted with you and I can truthfully say that I have felt your friendship to be genuine. It is my earnest desire that nothing will ever intervene to lessen or mar that friendship. It is also my sincere wish that the Railway and Marine World may grow in influence and interest as the years go by and that it will not only be a source of pride to you, its creator, but that it will also be a source of profit.

"A word about my retirement. For some time past I have felt that the duties of my position were becoming more and more strenuous each year; that if any serious illness befell me my recuperative powers could not be as good as they were 20 or 25 years ago. Besides, I believe that when a man reaches my time of life, filling some high position, that in order to give the officers associated with him in the business some opportunity for advancement, he should retire. I also feel that if I were to enjoy the balance of my days I should not wait until I had to retire through ill health. I will no doubt feel a little lonesome sometimes, almost like a clergyman in politics, but I have a number of interests in Winnipeg that will give me a reasonable amount to do."

Ownership of Canadian Northern Terminals, etc.—In the House of Commons recently the acting Minister of Railways stated, in answer to questions by the Hon. H. R. Emmerson, ex-Minister of Railways, that the C.N.R. terminals at Quebec, Montreal, Port Arthur, Winnipeg, Moose Jaw and other points except Port Mann and Vancouver, are owned by the Canadian Northern Ry. System Terminals, Ltd., the capital stock of which terminal company is owned by the Canadian Northern Ry. Company. The terminals at Vancouver and Port Mann are owned by the Canadian Northern Pacific Ry. Co., the stock of which company is all owned by the Canadian Northern Ry. Co. The title of the right of way through Carleton county, Ont., is owned by the Canadian Northern Ontario Ry. Co.

Canadian Ticket Agents Association.—As stated in our April issue, the Chicago and Northwestern, Union Pacific and San Pedro, Los Angeles and Salt Lake Lines recently tendered the C.T.A.A. a complimentary trip to Denver, Salt Lake City, Los Angeles and San Francisco for October, and the same was accepted, conditional on the C.P.R. and G.T.R. providing free transportation from Canadian points to Chicago and return. Opposition to the acceptance of the invitation appears to have developed in the C.P.R. and G.T.R. passenger departments, and a conference was held recently between the Passenger Traffic Managers of those two lines and the Association's executive. No official statement as to what took place is available, but it is said the difficulty in the way has not been removed and that the trip may have to be abandoned in consequence, in which case Halifax, N.S., may be selected for the annual meeting.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414.500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	298,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
Jan.	1,570,900	1,218,000	352,900	82,700
Feb.	1,324,600	1,086,000	238,600	x29,900
	$16,260,400	$11,628,200	$4,632,200	$640,500
Incr.	$ 1,108,400	$ 467,900	$ 640,500	.....

x Decrease.

Approximate earnings for March, $1,533,300 against $1,685,900 for March, 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-12, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$11,993,062.27	$7 876,269 09	$4,116,793.18	x$331 383.72
Aug.	11,434,459.88	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,503.96	4,226,821.71	x168,897.80
Jan.	7,916,216.25	6,916,042.19	1,000,174.06	x662,199.72
Feb.	7,594,172.73	6,122,596.27	1,471,576.46	1,048,492.88
	$90,796,551.01	$61,113,363.82	$29,683,187.19	$1,630,408.08
Decr.	$ 2,156,933.30	$ 526,525.22	$ 1,630,408.08	.....

x Decrease.

Approximate earnings for March, $9,298,000, against $10,965,000 for March, 1913.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T.W.R., and D.G.H. & M.R. from Jan. 1 to Feb. 28, and increases, or decreases, from the figures for same period, 1913:—

	1914	1913	Increase	Decrease
G.T.R.	$9,021,363	$9,704,824	.....	$683,461
C.A.R.	517,826	546,351	.....	29,025
G.T.W.R.	1,654,884	1,716,621	.....	61,737
D.G.H. & M.R.	549,088	531,147	$17,941	.....
Totals	$11,742,661	$12,498,943	.....	$756,282

Approximate earnings for March, $4,433,671, against $4,678,681 for March, 1913.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for March, were $461,997 against $415,377 in March, 1913. The aggregate earnings for three months ended Mar. 31, were $1,143,807 against $1,167,305 for same period 1913.

Suburban Steam Railway for Toronto.—In an address on city planning at the city development exhibition in Toronto, April 11, J. P. Hynes, advocated the building of a line running east and west from the Yonge St. crossing to a point 25 miles distant on each side from the heart of the city. There would be a grand central station built at Yonge St. and a number of stations at various distances along the line. The road would have direct connection with all railways and would open up a large amount of good residential districts which have now practically no transportation facilities. The road would also bring the present residents nearer to the city through rapid transportation. The road would also have separate tracks for local and express service and would be in a position to handle freight. Eventually it could be linked up with the suggested railway to be operated by the Harbor Commission, and in this way would belt the city.

The Railway Signal Association will hold its summer meeting at New York, May 27 and 28.

Mainly About Transportation People.

C. N. MONSARRAT, M. Can. Soc. C.E., Chairman, Quebec Bridge Commission, and Mrs. Monsarrat, are visiting Europe.

HUGH SUTHERLAND, Executive Agent, Canadian Northern Ry., Winnipeg, and Mrs. Sutherland, are in Europe.

N. J. HOLDEN, President of the Holden Co., railway supplies, etc., Montreal, who has been in Europe with Mrs. Holden, for some months, is expected back in May.

J. E. LONG, Safety Engineer, Canadian Government Railways, lectured on the Safety First movement at Moncton, N.B., Apr. 7.

G. F. BAER, President Philadelphia and Reading Ry. was stricken in the street at Philadelphia, April 25, with what physicians believed to be a stroke of paralysis. His death was announced shortly after.

W. WAINWRIGHT, Vice President, G.T.R. and G.T. Pacific Ry., Montreal, was absent from his office for several days early in April owing to a severe cold.

D. POTTINGER, I.S.O., formerly Assistant Chairman, Canadian Government Railways Managing Board, has been appointed an Esquire of the Order of the Hospital of St. John of Jerusalem.

F. P. BRADY, General Superintendent, Canadian Government Railways, who was in the Southern States for a few weeks, has returned to Moncton, N.B., and resumed his duties.

J. S. DENNIS, Assistant to the President, C.P.R., Calgary, Alta., addressed the members of the Lethbridge Board of Trade recently, chiefly on the duties of boards of trade in general.

D. C. COLEMAN, General Superintendent, Alberta Division, C.P.R., Calgary, addressed a meeting of the chief clerks of the division there recently, on the problems affecting chief clerks.

C. E. McPHERSON, Assistant Passenger Traffic Manager, C.P.R., Winnipeg, visited Los Angeles, Cal., recently, to attend the Western Transcontinental Passenger Agents Association's meeting.

J. E. McLEOD, Superintendent, Toronto District, Railway Mail Service, Post Office Department, has been granted three months leave of absence, at the expiry of which he will be superannuated.

R. COLCLOUGH, District Superintendent, Intercolonial Ry., Levis, Que., who acted as General Superintendent at Moncton, N. B., during the absence of F. P. Brady, has resumed his own duties.

F. W. COWIE, M. Can. Soc. C.E., Chief Engineer, Montreal Harbor Commissioners, has been awarded the Telford gold medal by the British Institute of Civil Engineers, for his paper on transportation problems in Canada and the Montreal harbor.

F. DANE, one of the Commissioners operating the Timiskaming and Northern Ontario Ry., on behalf of the Ontario Government, has resigned on his appointment as Trade Commissioner at Glasgow, Scotland, for the Dominion Government.

P. A. CRYSLER, who recently resigned the position of Assistant Master Car Builder, Eastern Lines, C. P. R., Montreal, has entered the service of The Holden Co., Ltd., dealers in railway supplies, etc., Montreal.

T. E. DRINKWATER, who had been in C. P.R. service for 25 years in Montreal and Fort William, Ont., in which latter place he spent 20 years, and who died there, Apr. 10, was a brother of the late C. Drinkwater, at one time Secretary, C.P.R. Co., and Assistant to the President.

F. SANDY, station agent, G.T.R., Peterboro, Ont., was, on Apr. 13, presented with a Morris chair, a silver tea service and club bag, by a number of local business men, and with a writing desk by the local employes, on leaving for Lindsay, Ont., where he has been transferred in a similar position.

A. M. NANTON, who was formerly Managing Director Alberta Ry. and Irrigation Co., and who is intimately connected with various transportation interests, in Western Canada, as well as being a Governor of the Hudson's Bay Co., returned to Winnipeg, Apr. 13, after a prolonged absence in Europe.

J. E. ROBERTS, heretofore Superintendent, Quebec, Montreal and Southern Ry., and Napierville Jct. Ry., Sorel, Que., has been appointed General Superintendent, Greenwich and Johnsonville Ry., Greenwich, N.Y., vice T. J. Lynch. The companies named are subsidiaries of the Delaware and Hudson Co.

P 384 L. C. Fritch,
Assistant to the President, Canadian Northern Railway.

C. S. MELLEN, formerly President New York, New Haven & Hartford Rd., who has been under indictment for manslaughter in connection with a wreck on that road, over a year ago, has been discharged from custody, on the ground that there is no evidence to connect him directly with the cause of the wreck, nor of gross negligence.

ALBERT HENRY SWEETMAN, whose appointment as Car Foreman, Canadian Northern Ry., North Battleford, Sask., was announced in our last issue, was born at Kensington, Eng., Feb. 25, 1883, and entered C.N.R. service in Mar., 1905, since when he has been, to Aug., 1910, in car shop, Winnipeg; Nov., 1910, to Feb., 1914, Assistant Foreman Repair Track, Winnipeg.

J. E. LONG, who has been employed by the Canadian Government Railways in connection with the safety first movement, was originally employed, the acting Minister of Railways told the House of Commons recently, in a similar capacity on the New York Central and Hudson River Rd., and is in receipt of a salary of $175 a month from the Government.

W. G. ROSS, Chairman, Montreal Harbor Commissioners, who, in company with F. W. COWIE, Chief Engineer, has been touring the chief harbors in Europe, with the view of obtaining information which might be of use in the developing of the harbor at Montreal, left London, Eng., recently for Nice, France, to meet Mrs. Ross. The party hopes to return to Canada during May.

JOSEPH GRAHAM, who has been appointed Assistant Roadmaster, C. P. R., North Bend, B. C., was born in Ontario, May 23, 1870, and entered C. P. R. service, Mar. 24, 1898, since when he has been, to Mar. 18, 1899, track laborer, Ashcroft, B. C.; Mar. 18, 1899 to Sept. 22, 1913, section foreman, Ashcroft and Kamloops, B. C.; Sept. 22, 1913, to Mar. 12, 1914, extra gang foreman, Kamloops and Tranquille, B. C.

CY WARMAN, who died at Chicago, Ill., Apr. 7, following a paralytic stroke, had been connected with the literary department of the General Advertising Agent's office, G.T.R., for several years. He achieved considerable success as a magazine writer, and in 1910 was President of the American Press Humorists' Association. In his early days he had worked as a locomotive wiper, fireman and driver in Colorado.

A. W. JONES, who has been appointed Commercial Agent, Chicago, Milwaukee and St. Paul Ry., Toronto, was born at Montreal, July 4, 1889, and entered railway service in Aug., 1903, since when he has been, to Nov., 1908, clerk, General Passenger Department, C.P.R., Montreal; Nov., 1908, to Apr., 1911, Soliciting Agent, Great Northern Ry., Montreal; Apr., 1911, to Feb., 1914, Travelling Freight and Passenger Agent, Chicago, Milwaukee and St. Paul Ry., Toronto.

JAMES J. NELLIGAN, whose appointment as Division Freight Agent, Canada Steamship Lines, Montreal, was announced in our last issue, was born at Hamilton, Ont., Jan. 20, 1876, and entered transportation service in 1892, since when he was, to 1904, in various positions, G.T.R. at Hamilton, St. Catharines, Ingersoll, Ont, and Montreal; 1904 to 1907, Travelling Freight Agent, Northern Navigation Co., Montreal; 1907 to March, 1914, General Agent, Canadian Lake Line, Montreal.

JOHN A. TAIT, District Freight Agent, Canadian Northern Ry., Regina, Sask., who resigned from railway service recently to enter the contractors' and builders' supply business there, was, from Oct. 1907, to Dec. 1908, clerk in the general office, C.N.R., Winnipeg; Jan. to Sept., 1909, City Freight Agent, Winnipeg; Oct, 1909, to Apr., 1910, Travelling Freight Agent, Winnipeg; May, 1910, to May, 1911, City Freight Agent, Regina, Sask.; June, 1911, to Apr., 1914, District Freight Agent, Regina, Sask.

LOUIS C. JACK, who has been appointed District Freight Agent, C. P. R., Kansas City, Mo., was born in California, Nov. 18, 1876, and entered railway service in 1896, since when he has been to Dec. 1900, clerk, local office, Chicago, Rock Island and Pacific Ry., Kansas City, Mo.; Dec. 1900 to June 1901, rate clerk, Chicago Great Western Ry., Kansas City, Mo.; June 1901 to Oct. 1905, chief rate clerk, general office, Union Pacific Rd., Kansas City, Mo.; Oct. 1905 to Apr. 1, 1914, Agent, C. P. R. Kansas City, Mo.

R. F. MACFARLANE, for several years in charge of the passenger business of the Dominion Line, the White Star-Dominion Line, and latterly of the White Star-Dominion, Canada and Austra-American lines, in conjunction with P. V. G. Mitchell, has re-

tired from active service, and taken up residence on his fruit farm at Winona, Ont. He entered the Dominion Line service in 1874, when it was known as the Mississippi and Dominion Steamship Co., with vessels running between Liverpool and New Orleans, and Liverpool and Montreal.

HAROLD T. MALCOLMSON, who has been appointed Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was born at Hamilton, May 22, 1877, and entered railway service in March, 1899, since when he has been, to Sept., 1899, stenographer to Superintendent, G. T. R., Toronto and Allandale, Ont.; Sept. 1899, to June, 1903, stenographer to General Superintendent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; June, 1903, to Mar., 1912, chief clerk to General Superintendent, and General Manager, same road; Mar. 25, 1912, to Jan, 14. 1914, Car Accountant, same road; Jan. 14, to Mar. 31, 1914, Superintendent of Car Service, same road.

W. J. HUNTER, Commercial Agent, G. T. R., and Division Freight Agent, G. T. Pacific Ry., Winnipeg, died there, Apr. 8, following an apoplectic stroke. He was born at Toronto, Jan. 10, 1864, and had been in G.T.R. service for about 30 years. He moved to Winnipeg, Dec. 31, 1903, on his appointment as Commercial Agent, G.T.R., there, and in 1907, was also appointed Division Freight Agent, G. T. P. R. Prior to settling in Winnipeg, he was, at various times Soliciting Freight Agent, Detroit, Mich., Travelling Freight Agent, Battle Creek, Mich., and Commercial Agent at Buffalo and Pittsburgh, consecutively. The funeral took place at Detroit.

JAMES T. GARDNER, who carried on an extensive railway equipment business in Chicago, and was well known in Canada, died suddenly at his home, Apr. 9. He began his career in railway service as a telegraph operator with the Pennsylvania lines in 1876. Two years later he was made Superintendent of the Buffalo, New York, and Philadelphia Ry., which position he relinquished in 1881 to become General Superintendent of the Buffalo, Rochester, and Pittsburgh line. From 1887 to 1890 he was General Manager of the Cincinnati, Saginaw, and Mackinac Rd., and the following year he went into the railroad equipment business.

B. W. FOLGER, who died at Toronto recently, was born at Cape Vincent in 1838, and came to Canada about 50 years ago, settling in Kingston, where he was one of the founders of the firm of Folger Bros., who at one time controlled the lighting and street railway systems in Kingston, and were also the principal stockholders in the St. Lawrence River Navigation Co., and the Thousand Islands Steamboat Co., now owned by Canada Steamship Lines, Ltd. He was, from 1876 to 1895, Superintendent, Kingston and Pembroke Ry., and was subsequently General Manager. He was one of the founders of the Canadian Pacific Express Co., in 1880, and of the Donelly Wrecking and Salvage Co., in 1890.

F. G. ADAMS, who has been appointed Commercial Agent, G. T. R., and Division Freight Agent, G. T. Pacific Ry., Winnipeg, was born at St. John's, Nfld., Apr. 6, 1878, and entered railway service Sept. 4, 1893, since when he has been, to Dec. 31, 1902, clerk, general offices, G. T. R., Montreal; Jan. 1, 1903, to Mar. 31, 1907, Contracting Freight Agent and Travelling Freight Agent, G. T. R., Montreal; Apr. 1, 1907, to Aug. 31, 1908, Contracting Freight Agent, G. T. R., Winnipeg; Sept. 1, 1908, to July 31, 1911, Travelling Freight Agent, G T. R., Winnipeg; Aug. 1, 1911, to July 14, 1913, Commercial Agent, G. T. Pacific Ry., Regina, Sask.; July 14, 1913, to Apr. 16, 1914, Division Freight Agent, G. T. Pacific Ry., Edmonton, Alta.

ROBERT BRUCE McINTOSH, who has been appointed chief clerk, General Freight Office, Canadian Northern Ry., Winnipeg, was born at Waterville, Que., July 5, 1888, and entered railway service, Sept. 10, 1904, since when he has been, to Sept. 1, 1905, clerk, General Purchasing Agent, C.P.R., Montreal; Sept. 1, 1905, to Aug. 31, 1906, clerk, Purchasing Department, Canada Car Co., Montreal; Aug. 31, 1906, to Oct. 19, 1907, in Freight Department, Canadian Northern Ry., Edmonton, Alta.; Oct. 19, 1907, to Sept. 10, 1909, in General Freight Office, G.T.R., Montreal; Sept. 10, 1909, to Mar. 30, 1910, in General Freight Office, C.N.R., Winnipeg; Mar. 30, 1910, to Nov. 18, 1911, in private business; Nov. 18, 1911, to Mar. 15, 1912, in General Freight Office, C.N.R., Winnipeg; Mar. 15, 1912, to Jan. 10, 1914, chief clerk, District Freight Office, C.N.R., Saskatoon, Sask.

HENRY BEATTY, who died at Toronto, Apr. 10, was born at Cootehill, Ireland, May

P385 R. Preston,
Assistant Superintendent of Motive Power, Western Lines, Canadian Pacific Ry.

1, 1834, and came to Canada with his parents, in 1843. In 1870, in conjunction with some relatives, he started a steamship business at Sarnia, Ont., and operated vessels to the upper lakes, under the name of J. and H. Beatty and Co. In 1877 the name was changed to Northwest Transportation Co., and he continued to manage the company until 1882. On the inauguration of the C. P. R. Upper Lakes Service he was appointed in charge, and remained in that capacity until 1892, when he retired from active service. He retained an intimate connection with the C. P. R. Steamship Department up to his death, and also acted as representative of the British Marine Underwriters. Of his sons, Dr. H. A. Beatty is Chief Surgeon, and E. W. Beatty is General Counsel, C. P. R

B. R. MARSALES, who has been appointed District Freight Agent, Canadian Northern Ry., Regina, Sask., was born at Guelph, Ont., Apr. 13, 1887, and entered railway service, July 25, 1901, since when he has been, to Aug., 1902, clerk, Hamilton, Grimsby and Beamsville Electric Ry., Hamilton, Ont.; Aug., 1902, to Mar., 1905, billing clerk, Michigan Central Rd., Suspension Bridge, N.Y.; Mar., 1905, to Mar., 1906, rate clerk, Central Railway Clearing House, Buffalo, N.Y.; Mar., 1906, to Apr., 1910, billing clerk, New York Central and Hudson River Rd., Buffalo, N.Y.; Apr., 1910, to Feb., 1911, in private business; Feb. 5, to May 1, 1911, in general office, Canadian Northern Ry., Winnipeg; May 1 to July 15, 1911, City Freight Agent, same road, Winnipeg; July 15, 1911, to June 1, 1912, City Freight Agent, same road, Edmonton, Alta.; Jan. 1, 1912, to Apr. 1, 1914, Contracting Freight Agent, same road, Brandon, Man.

ALBERT E. LOCK, who has been appointed Car Accountant, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was born at Albany, N. Y., July 14, 1879, and entered railway service, Dec. 1, 1896, since when he has been, to Sept. 1, 1897, telegraph operator and relief agent at various points, Lehigh Valley Rd.; Sept. 1, 1897, to July 1, 1902, tower man, telegraph operator, relief agent, ticket clerk, assistant agent, etc., Mohawk and Adirondack Divisions, New York Central and Hudson River Rd.; July 1, 1902, to Aug. 15, 1903, City Ticket Agent, same road, Lake Placid, N. Y.; Aug 15, 1903, to Sept. 15 1904, Travelling Passenger Agent, New York Central Lines, Saranac Lake, N. Y.; Sept. 15, 1904, to Nov. 1, 1913, Travelling Passenger Agent, New York Central Lines, Montreal; Nov. 1, 1913, to Apr. 1, 1914, Commercial Agent, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.

ROBERT PRESTON, whose appointment as Assistant Superintendent of Motive Power, Western Lines, C.P.R., Winnipeg, was announced in a recent issue, was born at Toronto, July 28, 1863, and entered railway service in 1877, since when he has been, to 1878, machinist apprentice, G.T.R., Toronto; 1878 to 1882, machinist apprentice, Toronto, Grey and Bruce Ry., Toronto; 1882 to 1884, machinist, C.P.R., Winnipeg, and Toronto, Grey and Bruce Ry., Toronto; 1884 to 1887, machinist, C.P.R., Toronto; 1887 to 1890, Locomotive Foreman, C.P.R., Havelock, Ont.; 1890 to 1894 Locomotive Foreman, C.P.R., London, Ont.; 1894 to 1897, Locomotive Foreman, C.P.R., Smiths Falls, Ont.; 1897 to 1898, Locomotive Foreman, C.P.R., Montreal; 1898 to 1901, Locomotive Foreman, C.P.R., Toronto; 1901 to 1903, Master Mechanic, C.P.R., Lake Superior Division, North Bay, Ont.; 1903 to 1909, Master Mechanic, Ontario Division, Toronto; 1909 to Feb., 1914, Master Mechanic, Manitoba Division, Winnipeg.

L. C. FRITCH, Assistant to the President, Canadian Northern Ry., Toronto, of whom some biographical particulars were given in our last issue, and whose portrait appears in this issue, is a member of the following engineering and allied associations:—American Society of Civil Engineers, American Institute of Electrical Engineers, American Railway Engineering Association, American Association for the Advancement of Science, Western Society of Engineers and the Geographical Society. He was President, American Railway Engineering Association in 1910, a director from 1905 to 1913, and a member of the rail committee in 1913; a member of the railway committee of the American Institute of Electrical Engineers, from 1910 to 1913; chairman of the committee on engineering of the American Railway Association, in 1913; a member of the committee on electrical working, of the American Railway Association, from 1910 to 1913, and a member of the committee on electricity of the American Railway Engineering Association from 1910 to 1913.

Grand Trunk Pacific Railway Construction.

We have been favored by the Chief Engineer, B. B. Kelliher, with the following statement of work done during 1913. Construction on the main line was in progress, also on eight branches in Manitoba, Saskatchewan and Alberta. In the case of the main line construction was confined to British Columbia, being worked both westerly from the eastern boundary of the province, and easterly from Prince Rupert, the Pacific terminus of the railway. Approximately 275 miles of grading and 297.6 miles of tracklaying were done on the main line during the year, and on the branches a total of 80 miles of grading and 267 miles of tracklaying, respectively, was done, so that during the year 355 miles of grading and 564.6 miles of tracklaying were done on the entire system. This is exclusive of second track and sidings. Below is a brief description of each portion of the work:—

Main Line.—At the end of 1913 grade was completed to mile 1270 west of Winnipeg, track being laid to within five miles of that point. The substructures for the large steel structures of the third crossing at mile 1233, and the fourth crossing at mile 1278, of the Fraser River, were being built. Grading was fully under way and well advanced to completion all along the line westerly until the end of steel was reached at mile 323.9 east of Prince Rupert, or mile 1422 west of Winnipeg. Railway in operation from Prince Rupert, easterly to Bulkley summit, mile 300. Grading in Prince Rupert terminals well advanced.

Harte-Brandon Branch.—Length 25 miles. 21.85 miles of grading completed, but no track laid. Erection of Assiniboine River bridge substructure was in progress at end of 1913.

Regina Boundary Branch.—Length 155 miles. Completed and in operation.

Talmage to Weyburn Branch.—Length 15 miles. Grading completed. No track laid.

Moose Jaw North West Branch.—Length 67.86 miles. Grading and tracklaying completed to mile 67.

Prince Albert Branch.—Length 111.5 miles. Grading completed throughout. Track laid to mile 87.2, at which point there is a large steel bridge over the South Saskatchewan River, the erection of which had not been commenced up to the end of 1913.

Cutknife Branch. — Length 50 miles Grade completed throughout. Track laid to mile 33 and should be completed during 1914.

Biggar-Calgary Branch.—Length 105 miles. Completed and in operation.

Calgary Branch.—Length 202 miles. Completed and in operation. Terminal work at Calgary has been commenced.

Speaking of the railway construction in the Dominion, in presenting the Railway Department's report to the House of Commons recently, the acting Minister said the construction of the line from Winnipeg to Prince Rupert, is divided into two sections—the prairie section from Winnipeg to Wolf Creek, and the mountain section from Wolf Creek to Prince Rupert. The first section is 914.9 miles, and is in full operation. There is some work at terminals yet to be completed, and some bridges and culverts to be put in permanent condition. The total amount expended to date upon this section is $40,427,322.65. The mountain section is 830 miles. From Wolf Creek to Fort George, 363 miles, the road is graded and track laid, with the necessary sidings, and 326 miles have had a good lift of ballast. Some steel bridges have not yet been erected, but the traffic now going into Fort George is being carried over temporary bridges. The concrete substructures for the third and fourth crossings of the Fraser River have been built. Station buildings have been erected to mileage 219 from Wolf Creek. From Prince Rupert easterly the line is completed and traffic is in operation for 339 miles, of which 100 miles have been fully ballasted, and 170 miles have received a first lift. Station buildings are either erected or are under construction on this mileage. There are 15 steel bridges yet to be erected to replace temporary pile structures. The intervening 128 miles, on which the acting Minister stated 90% of the grading had been completed, and steel was being laid at the date of the reports to him, have since been connected up with the east and west sections, the last spike having been driven by the Vice President, M. Donaldson, April 8. The total expenditure on the line is shown by the following general statement:

Mountain Section.—		
Total expenditure, as certified by Government Chief Engineer ...		$71,449,962 90
Company Chief Engineer . . .		71,514,398 00
Total payments to company . . .		52,139,534 50
Total payment to company upon guarantee and implementing same..	52,139,534.50	
Total payment to company on account of special loan	7,000,00000	
		59,139,534 50
Total cost to complete as given by by Government Engineer		9,089,000 00
Total cost to complete as given by company engineer		13,700,000 00
Cost per mile, Government Chief Engineer..		97,035 00
Cost per mile, company Chief Engineer		102,775 00
Prairie Section—		
Total expenditure		$40,427,322 65
Total payment to company upon guarantee	$11,135,482 91	
Total payment to company on account special loan	10,500,000 00	
		21,635,482 91
Estimated cost at completion....		41,335,180 00
Cost per mile....		45,180 00

The last mile of track on the main line from Winnipeg to Prince Rupert, was laid in the presence of Vice President and General Manager, M. Donaldson, and other officials, April 8. The party arrived from Winnipeg by special train, and were received at mileage 1,375 west of Winnipeg, and mileage 371 east of Prince Rupert, by officials from the western end of the line, and representatives of the contractors, Foley, Welch and Stewart. There was no special ceremony at the connecting up of the two sections of the line, and the special train immediately afterwards proceeded on its way to Prince Rupert, reaching there, April 9.

The line is 1,744.9 miles long, and is built throughout on a 0.4% gradient against eastbound, and on a 0.5% gradient against west bound traffic, with a maximum curvature of six degrees. The roadbed is 18 ft. wide and 80 lb. steel is used for the tracks. There are tangents on the prairie sections as long as 47 miles. Construction was started in Manitoba in 1905, and at Prince Rupert in 1908, and tracklaying was started Sept., 1906. Following are some of the principal features of the route:—

Elevation at Winnipeg, 767 ft. above sea level. For 160 miles west of Winnipeg line built on prairie level, reaching elevation of 1,650, with maximum grade of 0.5%—26.4 feet to the mile.

Banks of Qu'Appelle River followed for 35 miles.

Height of prairie land at mile 300 from Winnipeg, with elevation 2,225 (Touchwood Hills.)

Line follows prairie level at average elevation of 2,000 from mile 330 to Wolf Creek, mile 915, end of prairie section.

Mountain section commences at mile 915 (Wolf Creek.)

Athabasca River Valley followed for 100 miles, thereafter the Miette River Valley, a tributary of the former, for 17 miles westerly.

Continental divide reached at elevation 3,723. This is Yellowhead Pass, the highest summit on the entire transcontinental system.

Line proceeds from the Pass to the headwaters of the Fraser River, skirting the north shores of Yellowhead and Moose Lakes.

Fraser River Valley is followed and crossed four times between Tete Jaune and Prince George, elevation dropping as course is proceeded westerly from 2,400 to 1,880.

Nechaco River flows into Fraser River at Prince George.

Nechaco River Valley followed for 116 miles between Prince George and Endako, elevation rising from 1,880 to 2,245.

From Endako westerly the line follows Endako River Valley and skirts the north shores of Burns and Decker Lakes, reaching the headwaters of the Bulkley River at Bulkley Summit, elevation 2,366. Bulkley River Valley followed in a northwesterly direction to Hazelton, elevation 985.

At Hazelton the Bulkley River flows into the Skeena River.

From Hazelton to Prince Rupert line follows the banks of the Skeena River, there being a gradual descent in elevation to sea level.

There are 65 large steel bridges on the line having a total length of 5.3 miles. They are all designed to the highest Dominion specifications for heavy traffic. The largest bridges on the Prairie section are: South Saskatchewan, at Saskatoon, 1,500 ft. long and 71 ft. high. Battle River, mile 676 from Winnipeg, 5,440 ft. long, including approaches, and 190 ft. high. Clover Bar, over North Saskatchewan River, mile 786.5, 1,653 ft. long and 138 feet high. The largest bridges on the mountain section are: McLeod River, mile 915.6 from Winnipeg, 1,065 ft. long and 118 ft. high. Rau Shuswap, mile 1,124, from Winnipeg, 1,030 ft. long and 190 ft. high. Fourth Crossing, Fraser River, mile 1,278 from Winnipeg, 2,650 ft. long and 36 ft. high. The highest bridge is that over the Pembina River, 860 miles west of Winnipeg, rail level being 208 ft. above high water. The Fraser River is crossed four times, at mileage 1,073, 1,189, 1,233 and 1,278 from Winnipeg. The mainland and Karen Island, on which Prince Rupert is situated, are connected by the Zanardi Rapids bridge, 655 ft. long, and 33 ft. above high water

The company has also built and placed in operation 940.10 miles of branch lines, and is completing 119 miles of additional branch lines this season. These are located as follows:—

	Total Mileage.	Completed.
Manitoba—		
Harte-Brandon	25	.....
Saskatchewan—		
Melville-Canora	55.20	55.20
Melville-Regina	98.40	98.40
Regina-boundary..	155.00	155.00
Regina, Moose Jaw and N.W.	108.	90.20
Prince Albert branch	111.80	67.00
Battleford branch	48.50	48.50
Cutknife branch	50.00	3.60
Biggar-Calgary....	104.06	104.06
Talmage-Weyburn	15.00	.....
Alberta—		
Tofield-Calgary..	201.50	201.50
Alberta Coal branch	56.40	56.40
Mountain Park Coal branch..	30.24	30.24

At the Canadian Railway Club's monthly meeting at Montreal, Apr. 14, J. E. Duval, General Superintendent of Car Service, G. T.R., read a paper on the misuse of cars and the causes of car shortage.

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F. W. COWIE, M. Can. Soc. C. E., Chief Engineer, Montreal Harbor Commission, read a paper, Apr. 7, before the Institute of Civil Engineers, London, Eng., the general trend of which was to demonstrate the desirability of an all Canadian route from Great Britain and the European continent, with Montreal as the head.

Quick Time in Floating Operations on C.P.R. Lachine Bridge.

In publishing the article on the double tracking of the C.P.R.'s St. Lawrence River bridge at Lachine, by P. B. Motley, Engineer of Bridges, C.P.R., in our last issue, the table showing the time occupied in the floating operations was inadvertently omitted. It should have followed the matter at the bottom of pg. 153, column 1, and is as follows:—

Span.	Between piers nos.	Date floated into position.	Elapsed time. Hrs. Min.	Net time occupied in moving. Hrs. Min.	Total distance floated.
Downstream—408 ft	13 and 14	Nov. 4|12	3—0	1—0	275 ft.
Downstream—408 ft.	12 and 13	Nov. 22|12	2—30	28½	275 ft.
Upstream—408 ft.	12 and 13	Sept. 18|13	1—30	22½	275 ft.
Upstream—408 ft.	13 and 14	Oct. 6|13	2—0	16	275 ft.

Canadian Freight Association Committees.

The following standing committees were elected at the annual meeting in Montreal, April 16:—

ADVISORY—C. E. Dewey, W. M. Kirkpatrick, G. H. Shaw, J. H. Meglemry.

EXECUTIVE—W. M. Kirkpatrick, F. F. Backus, G. Tombs, H. C. Martin.

CLASSIFICATION—W. M. Kirkpatrick, J. Edward, G. Tombs, F. J. Watson, E. N. Todd, L. Macdonald, H. E. Macdonnell, G. T. Pettigrew, R. E. Perry, M. H. Brown.

FREIGHT INSPECTION—R. W. Long, F. A. Shaw, M. H. Brown, R. W. Youngs, R. J. S. Weatherston, J. Edward, G. H. Clark, W. B. Bamford, W. S. Elliot.

The General Utilities Corporation has been incorporated under the Dominion Companies Act with power among other things to acquire and operate electrical power plants; to operate steam and other vessels; to build docks, wharves and warehouses. The capital is fixed at $50,000; its office is at Sorel, Que., and the provisional directors are:—A. E. Pontbriand, Mrs. M. L. Pontbriand, J. A. Simiard, Mrs. R. B. Simiard, A. Peticlere, Sorel, Que.; G. E. Pontbrian, Shawinigan Falls, Que.

Plans for the C. P. R. Building at the San Francisco exhibition of 1915 have been prepared. The building, which was designed by F. S. Swales, will cover a ground space of 65 feet square, and will be a one story structure in the Spanish renaissance style. The roof will be of tile and the wide cornice will be colored to conform with the general style of the neighboring buildings. The interior will be divided into an exhibition hall, and a moving picture hall.

The Ottawa City Cartage Co. has been incorporated under the Ontario Companies Act to carry on a general cartage and forwarding business, in connection with railways, steamships, etc., and particularly to take over the business at present carried on by the City Cartage Co. Its capital is fixed at $40,000; its office is at Ottawa, and its provisional directors are: G. S. Kelley, W. L. Scott, A. J. Fraser, M. J. Brennan, and L. E. Milks.

The Ottawa Motor Transportation Co. has been incorporated under the Ontario Companies Act to carry on the business of cartage contractors, warehousemen, and other allied businesses in Ottawa and else where throughout Ontario. The capital is fixed at $40,000; its office is at Ottawa, and the provisional directors are:—G. D. Kelley, C. H. Maclaren, A. J. Fraser, M. J. Brennan and L. M. Sibley, Ottawa.

Hamilton Incline Ry.—Orders have been placed with the Canadian Electric Co., for one special double fixed drum, double geared electric Lidgerwood incline hoist, two C. G. E. 180 h.p., 550 volt, d.c. motors with special automatic control; one C. G. E. motor generator set; one Tudor storage battery of 262 F. 11 cells, and one C. G. E. four panel switchboard.

Dredge for Little Current Work.

A dipper dredge, which is being built for the C. S. Boone Dredging and Construction Co., of Toronto, for use at Little Current, Ont., was launched by M. Beatty & Sons, Ltd., at Welland, Ont., April 13. It is of steel, 100 ft. long, 40 ft. wide, 10 ft. deep at bow, and 8 ft. at stern. It is of the crane type, the crane being 40 ft. long. The dipper is of 5 cu. yds. capacity, the dipper handle is 61 ft. long, which will allow it to make 40 ft. of water. The main engine is double cylinder, 15 in. bore by 15 in. stroke, the boiler 10 ft. dia. by 12 ft. long, of the Scotch marine type. Each bow anchor or spud is operated by an independent reversible engine, 10 in. bore by 10 in. stroke, compound geared, the anchors being raised and pinned up by steel cable. The engine for handling the stern anchor is 9 by 9 compound geared. On each side of the deck forward is a 7 by 7 double cylinder, triple friction, drum engine, to be used for warping the dump scows into position. It is expected to have the dredge completed and ready for towing early in May.

A new type of coal chute has been installed on a large coal pier of one of the larger U. S. lines. The chutes, which will be telescopic, and automatic in operation, will be attached to the end of the pocket through which the coal passes when leaving the car, and will be adjusted to an angle which will eliminate a large amount of the destructive effect of gravity.

Electrification of the Norwegian Government railways is the subject of a newly submitted report by a special commission. The excessive prices of imported coal (Norway having no coal mines) led to the investigation of the feasibility of using "white coal," and the electrification of seven trunk lines at a cost of $9,000,000 is recommended.

The gas electric car which was operated on the Quebec and Lake St. John Ry. between Quebec and Lake St. Joseph during the past two summers, and which has been running on the Canadian Northern Ontario Ry. between Picton and Napanee, Ont., during the past winter, will continue in the latter service this year.

F. G. Smith, Chief Draughtsman, Canadian Allis-Chalmers Ltd., read a paper on steel railway bridges before the Central Railway and Engineering Club, in Toronto, April 28.

N. C. Stibbs, Storekeeper, C.P.R., Lethbridge, in remitting his renewal subscription to Canadian Railway and Marine World writes:—"Please find enclosed subscription to your valuable paper for 1914."

H. M. Gain, Trainmaster, G.T.R., Belleville, Ont., writes:—"I value very much the information contained in each issue of Canadian Railway and Marine World."

The Montreal Harbor Commissioners propose to expend about $300,000 on railway equipment during this year.

The Board of Railway Commissioners' Judgment in the Western Rate Case.

Western freight rates, in one form or another, have engaged the attention of the Board of Railway Commissioners since its inception in 1904. The complaint of the Vancouver Board of Trade, in the Coast Cities Case, alleging discrimination, was preferred before Commissioners Blair and Mills on Aug. 25, 1904. It was again brought up in another form in Oct., 1909, supplemented by an application of the British Columbia Government. The Winnipeg Board of Trade, on Nov. 14, 1911, passed a resolution alleging that the tolls of western lines were both unreasonable and discriminatory, and forwarded it to the Minister of Railways. This was referred to the Board of Railway Commissioners on Dec. 4, 1911. On Jan. 8, 1912, the late Chief Commissioner, J. P. Mabee, and his fellow commissioners determined that a full inquiry was necessary as to the reasonableness of the freight tolls, and placed upon the railways the onus of justifying the discrimination alleged to exist. The whole progress of the inquiry involved 62 hearings, taking up 100 days, at every important point from Port Arthur to Victoria, besides Montreal, Toronto and Ottawa; 72 witnesses were examined; 158 exhibits containing 4,870 pages were filed; and 6,148 pages of evidence were taken down.

The cases of the Vancouver and Victoria Boards of Trade and the B.C. Government were handled by W. A. McDonald, K.C., and C. G. McPhillips, K.C., assisted by the Vancouver Board of Trade's Traffic Officer and Mr. Calderhead, Statistician to the Washington State Commission. M. K. Cowan, K.C., ex M.P., represented Alberta and Saskatchewan, Alex. MacDonald, of Winnipeg, preparing his traffic exhibits. The Winnipeg Board of Trade engaged the services of Isaac Pitblado, K.C. The Dominion Government was represented by Jas. Bicknell, K.C., of Toronto; R. W. Whitla, K.C., of Winnipeg, and F. A. Morrison, K.C., of Alberta, assisted hy Mr. Carpenter, Traffic Officer of the Winnipeg Board of Trade, and Mr. Muller, formerly Statistical Officer of the Interstate Commerce Commission, as experts in traffic matters. The C.P.R. was represented by its Chief Counsel, E. W. Beatty; F. H. Chrysler, K.C., of Ottawa, who conducted the case, and W. N. Tilley, K.C., of Toronto; the Canadian Northern by its Chief Counsel, F. H. Phippen, assisted by F. A. Anderson, of Winnipeg; the Grand Trunk Pacific by its Chief Counsel, W. H. Biggar, K.C., and Mr. Lafleur, K.C., of Montreal.

The case was hardly under way when the death occurred, in May, 1912, of Chief Commissioner Mabee. His successor, H. L Drayton, K.C., was appointed in July, 1912, and some delay naturally ensued until he became familiar with the material that had been presented. Hearings from that date were held whenever possible, the last on Dec. 11, 1913. Making allowance for the Christmas season, the commissioners were but little over three months in reviewing the immense mass of statistics, accounts, evidence and argument, and reaching a conclusion thereon.

The judgment, which was delivered on April 7, covers some 200 pages and deals with each contention in order. It refers frequently to the report of the Board's Chief Traffic Officer, Jas. Hardwell, and attaches his examples of reductions ordered. The following is an official summary of the judgment:—

On account of the different interests concerned, the conflicting evidence, the number of hearings, and the importance of the subject, there is set out at length a history of the application. The first step leading up to the inquiry was the resolution of the Winnipeg Board of Trade, on Nov. 14, 1911. This resolution was forwarded to the Government, and the matter was referred to the Board for action. There was at the same time pending a complaint of the Vancouver Board of Trade that the existing rates from eastern points on a western movement were discriminatory as compared with rates from Vancouver on an eastern movement. The Vancouver complaint, being bound up with and affecting the question of western rates, was joined in the Board's order of Feb. 15, 1912, with the general investigation of rates in Manitoba, Saskatchewan and Alberta, and in Ontario west of and including Port Arthur, which had been provided for in its order of Jan. 8, 1912.

It is unfortunate that an issue has been made between the east and the west. Cash payments or credits from the east in aid of railway development do not justify higher rates in the west. The opening up of the west by railway construction is of value to the east. The lower the rates in the west, the greater the extension of eastern business therein. The lower the rates in the east, the lower is the rate charge on which western goods find their way into the world's market. It is contended that the existing rates in the east are made possible by the excessive rates in the west. An analysis of this points out that the C.P.R. first commenced its operation in the west; that its main line was opened May 26, 1887; and that when it commenced its operation east of Fort William, it simply adopted the rates charged by other railways in that territory, and the rates so adopted were not affected in any way by the rates west of Fort William. No voluntary benefaction by way of reduction of rates was made to the people in the east at the expense of the people in the west.

In an attempt to ascertain whether the existing rate structure was inordinately profitable, the earnings of the C.P.R. were apportioned between its operating divisions on the basis of the mileage contained therein. It is recognized that in so dividing revenues between the eight operating divisions of the C.P.R., results are arrived at which are not characteristic. For example, the Lake Superior Division, which originates or terminates practically no traffic, is shown with a large proportion of revenue. As was pointed out by M. K. Cowan, K.C., the railway operating divisions are not the proper basis for distribution of revenue, because, for example, the provincial boundaries of Saskatchewan and the boundaries of the railway operating division of Saskatchewan are not the same.

The judgment makes a lengthy and careful consideration of the legislative provisions in regard to discrimination, setting out the provisions of the Railway Act which bear upon this matter. The Railway Act does not forbid all discriminations and preferences; it forbids an unjust discrimination or an undue preference. The Board has recognized in various decisions that the question whether discrimination is unjust or a preference undue is a matter of the particular facts of a particular case. Examples are cited. Group rates, while they have some elements of discrimination, are in the public interest so long as the discrimination is not unjust. Water competition has been recognized as a factor affecting rates. The Board has held that it is in the discretion of the railway whether it shall or shall not make rates to meet the competition of markets. A similar position has been taken by the English Railway and Canal Commission. The Board has recognized that a division of the through rate is not a necessary measure of the reasonableness of the local rate. Special rates, such as those contained in town tariffs, and commodity rates, result in some discrimination. The commodity tariffs, under which the large bulk of the country's merchandise moves, work a two fold discrimination. In the first instance, a discrimination in favor of shippers of a particular class of merchandise from points where the volume moving justifies commodity rates as against shippers of the same commodity at points where no commodity rates exist; and, secondly, a discrimination in favor of an article carried at the commodity rates as against articles of a kindred nature which might come more or less into competition with an article moving under a commodity rate. But the low commodity rate basis works to the advantage not only of the shipper but also of the consumers. The effect of a town tariff is to give the advantage to a distributing centre as against similar stations within the area in which goods are distributed under the town tariff scale. While, theoretically, it might be proper to do away with town tariffs, it appears for the present that it would be contrary to public interest to interfere with the principle of town tariffs under which many distributing centres, particularly in the west, have been able to meet the competition of the well established distributing centres in the east. No doubt other distributing centres will spring up and make use of the town tariffs, when an economical distribution of merchandise seems to demand such centres.

It being recognized that the rates west of Fort William are higher than those east, the question of the factors affecting eastern rates has to be considered. In the territory extending from Windsor and Sarnia to eastern ocean ports, there is real and effective railway competition of United States lines. This competition was recognized by the Board in the International Rate Case. Water competition is effective throughout Eastern Canada as far as Port Arthur and Fort William. The low rate basis brought about by the lake transportation facilitates the movement of commodities into and out of the west. Counsel for Saskatchewan and Alberta recognized the existence of water competition at certain points, but disputed its efficiency at points some distance more remote from the railway. He recognized that the water competition might either be actual or potential, and that the water rate may hold down the combined lake and rail rate. It may be pointed out that the rate from the east to Winnipeg is influenced to a considerable extent by the water rates to the head of the Lakes.

The C.P.R.'s Atlantic Division is shown by the returns to be unprofitable. The rates in the Maritime Provinces are low, not only as a result of water competition, but also as a result of the Intercolonial rates, a road whose operations have largely resulted in deficits. The earnings of this division, on the mileage basis, are also held down by the fact that a large part of the business is through traffic carried on a low rate. In the case of a grain movement from Regina to St. John on a through rate, the Atlantic Division may be apportioned a part of the through rate proportioned to the mileage moved by it within this division. If the basis of the rates on western products to St. John were applied to the local traffic of the Atlantic Division, the local rates would

be very greatly depressed. From Woodstock, N.B., to St. John, for instance, the company would receive on a grain or flour shipment on the Regina basis only one-sixth the local tariff rate. The through rates keep down the average earnings. The Atlantic Division is in reality to be regarded as a terminal. The result is that the western provinces, producing as they do grain and flour, and interested as they are in a cheap furtherance rate, not only from their own borders but also to the seaboard, instead of being injured, participate in the benefits of the low through rates on grain and flour passing through this division.

So far as New Brunswick and Nova Scotia are concerned, no argument whatever was advanced denying the existence of water compelled rates. So far as Ontario is concerned, exception was taken to certain points only. By far the greater part of railway business in Eastern Canada is on the line of water competition. The rate basis in Eastern Canada, both adjacent to and more remote from the waterways, was established by the railways at a time when there was no regulation of rates. The rate basis they put in was affected both by water and by U.S. rail competition. Mr. Muller, the expert called by counsel for the Dominion Government, pointed out the effect of U.S. rail competition in connection with C.P.R. traffic in Eastern Canada. Mr. Calderhead, an expert of the Public Service Commission of the State of Washington, stated in evidence that the rates between New York and Chicago are influenced both by rail and water competition, and that the effect of water competition of the Great Lakes is operative at St. Paul, 149 miles inland. No evidence has been submitted by any of the complainants negativing the force either of water or of railway competition in the east, or the resultant effect of such competition. The Board is of opinion that while discrimination exists between the rates charged east and west of Port Arthur, the discrimination is justified under the Railway Act and the decisions of the Board; that is to say, it is not an unjust discrimination or an undue preference. In the main, the rate structure of Eastern Canada is justified on the basis of water and railway competition. There may be some points where discrimination which cannot be justified by competitive reasons exists. It may be that in connection with these there would be justification for increase of rates.

An examination of the different tariffs east of Fort William voluntarily put in by the railways or ordered by the Board since Dec. 1, 1904, has been made. The important changes are set out at length in the judgment. The analysis of the changes made by the Board's orders in rate matters in the east shows that these have been almost wholly concerned with the abuses flowing from undue discrimination. The Board's order in the International Rate Case resulted in a general revision of class rates in Eastern Canada. This was concerned entirely with the removal of existing discriminations under which the shipper in the Western States could use the Canadian lines at a proportionately much lower rate than the Canadian shipper could. The result of the order was to recognize the water competition between U.S. rail carriers and water carriers which brought about the Detroit rate, and, further, to recognize the general effect of this water competition throughout the Canadian territory east of Detroit. The analysis of the tariffs shows that the railways have been desirous of raising the rates wherever possible. The rates in Eastern Canada may be low; perhaps at certain points too low, even in view of its geographical advantages. It cannot fairly be said, however, that these low rates are in any manner the result of excessive western rates. They are practically the rates which applied long before the profits of western railway operations had anything to do with Canadian railway resources.

The existing railway mileage in Western Canada is inadequate, at least so far as Saskatchewan and Alberta are concerned. To ascertain to what extent the existing railway mileage meets the needs of Western Canada, calculations have been made to show how much acreage in these provinces is more than 10 miles from the railway. Complaints made to the Board by farmers in the west show that, on the average, a 10 mile haul enables the farmer, where there are fair roads, to market his grain and return home in one day. Railways laid out, having in view a maximum 10 mile haul, would not be constructed nearer to each other through the farming territory than 20 miles. On this computation, the railways existing in Saskatchewan serve 70,000 square miles, or 44,000,000 acres on the basis of the 10 mile haul. South of Township 58, there is an area of 121,000 square miles, or 77,000,000 acres, thus leaving 51,000 square miles or 32,000,000 acres yet to be served. Railways which may be constructed under the guarantees of the Province outstanding last year, when completed, would provide facilities for 17,000,000 additional acres. This would leave in the territory south of Township 58, 39% of the total acreage further than 10 miles from the railway. In Alberta, within the boundaries formed by Township 74 and Range 10 of the West Meridian, there are about 85,000,000 of acres. In this acreage, existing railway lines serve 26,000,000 acres, on the basis of the 10 mile haul, leaving over 58,000,000 acres yet unserved. Railways proposed to be constructed under the guarantees of the Provincial Government and outstanding last year will provide for about 17,000,000 acres more, leaving 48% of the territory so referred to further than 10 miles, at least, from any railway. Complaints have been received by the Board that farmers living at a distance of from 18 to 35 miles from the railway spend, on getting the grain to the railway, more than it costs to take it from the railway station to Fort William. The farmers of Mervin district, Sask., furnished information which showed that grain was hauled into Edam, 35, 40, and 45 miles; that on a 14 mile haul from Mervin to Edam, allowing $5 a day for teams and proper allowances for expenses on the way, the cost of haulage was 20c. a bush.; that on a 35 mile haul, a smaller load had to be taken and the round trip required from two to three days, making the cost of marketing about 32½c. a bush.; that is to say, farmers hauling a distance of 35 miles to Edam, with a load of 40 bush., were at an expense of 32½c. a bush. to get it to the station, while from Edam to Fort William, 1,046 miles, the rate was 14 4-10c. a bush. A petition signed by 390 farmers of Eagle Creek district, Sask., showed that a large amount of grain taken out from the district necessitated a two days haul, and the cost of getting the grain to the station was 25¼c. a bush., as against a rate of 13c. a bush. from the station to Fort William, 939 miles. The cost of haulage on earthen roads runs from 20c. to 25c. a ton per mile. From the standpoint of the necessity for railways, the activity of the provincial governments in assisting railway construction, with a view to shortening the average haul of the farmers, appears well justified. Mr. Pitblado, for the Winnipeg Board of Trade, argued that the construction of such lines is in the first instance unremunerative, and that this accounted for the Canadian Northern returns not being satisfactory. Mr. Cowan took the same position. At the same time, it must be recognized that the bulk of the C.N.R. branch line mileage within Saskatchewan and Alberta has been made at the direct request of the provincial governments, and with their financial support.

Railway extension is of immediate interest to the distributing centres of the west, as every addition to the railway network widens the consuming area. On the other hand, the farmer who already has railway facilities is not interested in the providing of them for competing farmers. Extensions into new territory should be made at the risk of the company rather than at the expense of shippers on the old lines. At the same time, consideration must be given to the necessity of enabling railways to obtain additional capital. Extensions of service, betterment of facilities, and the enlargement of terminals have from time to time to be met often in the old settled districts of the country. As a matter of public policy, railway rates should be rates of such a character as to attract investment and to render the railway securities marketable.

Counsel for the Dominion Government pointed out that regulations of rates, without adequate control of future railway development, would likely lead to the duplication of mileage. Mr. Pitblado also stated there was too much paralleling of railways in the west. The situation in respect of the location of railway mileage in the west has been examined into. It is recognized that a certain amount of overlapping will have to take place on account of the lines making grades, the question of physical conditions, and the matter of access to the large centres of population. It does appear that in Manitoba, taking that portion lying south of Township 19, Lake Manitoba, and Township 14, as far east as Selkirk, that there are 2,850 miles of track, while 2,000 in this area would be sufficient to place railways within 10 miles of every farmer; that is to say, there is 40% more mileage than the territory requires on the 10 mile basis. The conditions in Saskatchewan show, by dividing the territory into blocks, the following results:

Territory east of the 3rd Meridian and south of the northern boundary of Regina and Saltcoats Districts—Area, 110 by 144 miles. Total mileage, 2,622. Total mileage required to cover territory at 10 mile distance, 2,400. Total duplication, that is where lines are within 20 miles of each other, 850, or about 33%.

Territory in Saskatchewan north of Regina and Saltcoats Districts, and east of the 3rd Meridian and south of the south boundary of Township 41—Area, 192 by 96 miles. Total mileage, 847. Total mileage required to cover territory, 1,700. Total duplication, that is where lines are within 20 miles of each other, 193, or 23%.

Territory north of south boundary of Township 41, east of 3rd Meridian and south of Township 51—Area, 180 by 60 miles. Total mileage, 306. Total mileage required to cover territory, 1,120. Total duplication, that is, where lines are within 20 miles of each other, 50, or 16%.

Territory between 3rd and 4th Meridian, and south of the south boundary of Township 24—Area, 180 by 138 miles. Total mileage, 430. Total mileage required to cover territory, 2,000. Total duplication, that is where lines are within 20 miles of each other, 36, or 9%.

Territory between 3rd and 4th Meridians and the south boundary of Township 51 and the north boundary of Township 23—Area, 168 by 162 miles. Total mileage, 1,656. Total mileage required to cover territory, 2,800. Total duplication, that is where lines are within 20 miles of each other, 302, or 18%.

Similar computations, by districts, in the

case of the Province of Alberta, give the following results:

District of Victoria—Total mileage, 166. No duplication.

District of Strathcona—Total mileage, 554. Total duplication, that is where lines are within 20 miles of each other, 111, or 20%.

District of Red Deer, east of east boundary of Range 8, West 5th Meridian—Area, 210 by 75 miles. Total mileage, 684. Total duplication, that is where lines are within 20 miles of each other, 138, or 20%.

District of Calgary—Total mileage, 357. Total duplication, that is where lines are within 20 miles of each other, 110, or 30%.

District of MacLeod—Total mileage, 384. Total duplication, that is where lines are within 20 miles of each other, 110, or 29%.

District of Medicine Hat—Total mileage, 746. Total duplication, that is where lines are within 20 miles of each other, 115, or 16% of the constructed lines.

In British Columbia there is the paralleling of the Canadian Northern and Canadian Pacific, while in Western Alberta there is the paralleling of the Canadian Northern and the Grand Trunk Pacific. It is recognized that paralleling also exists east of Fort William. No opinion is expressed as to how much of this duplication was or was not necessary. Mr. Pitblado's criticism is, in part at least, well founded, and the necessity for some business control by the Government which will prevent unnecessary duplication of facilities is established.

Which, if any, of the three lines, Canadian Pacific, Canadian Northern, and Grand Trunk Pacific, should be taken as a typical line? It is impossible for the Board to deal with rates in the west on the hypothesis that the C.P.R. is the only railway which should be taken into consideration; nor can it be held that the only measure of what rates should be is to be found in the position occupied by the C.P.R. Counsel for the Dominion Government expressed the wish that the Board would so reduce rates, taking the C.P.R. as a standard road, as not to injure other lines. He was unable to suggest how that end could be accomplished, nor was this to be wondered at, as, beyond all question, rates based on the C.P.R.'s power to stand reductions would inevitably bankrupt not only both the Canadian Northern and the Grand Trunk Pacific, but for the future preserve the western provinces to that company in so far as any new companies or new lines were concerned. It would be impossible for any ordinary company to live in competition with the C.P.R. under such conditions. The rates must be considered having regard to the traffic necessities of Western Canada and a fair return to the carrier, apart entirely from any question of reserves of the company on the one hand or liabilities of the company on the other. The matter must be dealt with from the standpoint of the principle laid down by the late Chief Commissioner, J. P. Mabee, who, at the outset of the inquiry, laid down the line of action in the following words: "With reference to the inquiry into the financial standing of the companies, it seems to me that if one is to be investigated they should all be investigated. We should not be submitted to the possibility of prejudice in settling these rates by placing before our eyes the millions and millions of treasure that the C.P.R. is supposed to have hoarded up. The question for us to decide is what rates are fair irrespective of how much any company is worth or is not worth."

The Board must take the existing railway mileage as it finds it. It was suggested that Parliament had not shown due care in chartering railways, or in allowing them to be constructed. The Board has had nothing to do with the steps whereby additional railway mileage came into existence; and it is not in any way concerned with the question of whether or not a railway was constructed from the standpoint of political expediency, and expresses no judgment thereon.

Counsel for the Dominion Government presented as a basis for rate making a method whereby average costs might be ascertained. As explained by the expert, Mr. Muller, it is not concerned with specific or actual costs. An attempt is made to distinguish terminal charges from road haul charges. The terminal charges as well as the road haul charges are computed on a series of averages requiring the use of very complicated statistical methods. In dealing with the apportionment of expenses between freight and passenger business, Mr. Muller uses nine different methods of statistical apportionment. The statistical averages of the cost of road haul movement as computed depend on the averaging of high grade and low grade, long haul and short haul traffic. Neither the road cost nor the terminal cost so worked out is claimed to be in accordance with actual costs. All that is claimed is that it is an average. It is suggested that the cost so averaged out will, by the addition of a proper percentage to cover capital charges, afford a proper basis for the making of rates. The method which he advocates has never had a thorough going practical test as a basis of rate making. The Interstate Commerce Commission has not yet been able to work out, with its large statistical force, a satisfactory system based on cost. It has further stated that cost estimates of the kind in question cannot be relied upon as decisive factors. A portion of the C.P.R.'s present revenue is due to its having a through line, while the Canadian Northern and Grand Trunk Pacific are not yet in this position. With the opening up of the through lines of the two latter railways, not only will they share in the through business but business which they are at present handing over to the C.P.R. will be handled by them. But Mr. Muller says that to work out rates based on his system a five year period should be taken for comparison, and that the rates so worked on his basis should be revised every five years. However, with the change brought about by the opening up of the Canadian Northern and Grand Trunk Pacific through lines, rates based on the C.P.R.'s past performance would have no proper application to the new conditions arising. While recognizing the statistical ingenuity of the theory, it must at the same time be recognized that this theory has never had a practical test under such conditions as are present in this inquiry. There would be many difficulties in applying it, nor can it be said how it would work out. What is needed is a practical working method. With due consideration of all the factors concerned it does not appear how any practical application can in the present instance be made of this theoretical project for a new system of rate making.

After dealing with various arguments of counsel, the judgment proceeds to outline a comprehensive basis of tolls and a complete rate structure for all railways in Western Canada subject to its jurisdiction. The territory west of the Great Lakes is divided into three sections. The first is called the Prairie Section, extending from the Great Lakes to the Mountains; the second the Pacific Section, including mainland rail lines in British Columbia; and the third the B.C. Lakes Section, including the inland navigable waters in that Province. A standard scale of maximum freight rates is fixed for each section. The lowest scale in the west, now known as the Manitoba standard, has been amplified to show rates up to 2,100 miles, and will apply throughout the entire Prairie section and on the British Columbia Lakes, abolishing the higher scale now charged in Saskatchewan and Alberta. What will be known as the Pacific scale is on a somewhat higher basis and will govern in Pacific territory. These changes result in substantial reductions from the present standard maximum scales in Saskatchewan, Alberta and British Columbia.

Special distributing tariffs on a lower basis are authorized from recognized distributing centres, the reduction from the standard tariff of each territory being 15% of the prairie standard scale. The following first class rate examples indicate the character of the reductions, the other classes being proportionately scaled. The 1st class rate from Winnipeg to Regina is reduced by 8c.; to Swift Current by 9c.; Calgary, 12c.; Revelstoke, 15c.; Saskatoon, 13c.; Edmonton, 16c.; Lethbridge, 10c. per 100 lbs. From Regina the 1st class rate is reduced to Broadview by 3c.; to Swift Current, 6c.; Medicine Hat, 7c.; Colonsay, 13c.; Saskatoon, 6c.; and Wilkie, 18c. per 100 lbs. From Saskatoon the 1st class is reduced to Hardisty by 7c.; Wynyard, 4c.; Davidson, 4c. per 100 lbs. From Calgary to Regina, 10c.; Macleod, 3c.; Edmonton, 4c.; Lethbridge, 3c.; Cardston, 4c.; Fernie, 8c. per 100 lbs. From Edmonton to Saskatoon, 4c.; Camrose, 6c.; Wetaskiwin, 6c.; Calgary, 4c.; High River, 7c.; Lethbridge, 9c. per 100 lbs. Similar reductions are made from other prairie jobbing centres. From Vancouver to Ashcroft, 14c.; Kamloops, 20c.; Revelstoke, 26c.; Nelson, 15c.; Calgary, 7c. per 100 lbs.

Through rates from Eastern to Western Canada are based on those charged from Port Arthur or Fort William. After citing reductions already made by the Board in the Regina Rate Case, further reductions are made and a more uniform basis adopted. Examples of the new rates from the Lake Terminals are given below, those to other points being similarly scaled:—

Classes.		1	2	3	4	5	6	10
To Winnipeg—	Old rates	86	72	57	42	38	34	20
	New rates	85	71	56	42	38	32	19
Regina—	Old rates	154	129	102	77	68	59	34
	New rates	146	122	98	73	65	56	33
Moose Jaw—	Old rates	159	132	106	79	71	61	36
	New rates	153	128	102	77	69	60	35
Calgary and Edmonton—	Old rates	224	186	149	112	102	90	52
	New rates	213	178	142	106	95	85	49
Saskatoon—	Old rates	175	146	116	87	78	68	40
	New rates	164	137	110	82	74	64	37
Lethbridge—	Old rates	215	179	142	107	96	85	49
	New rates	201	167	133	100	90	79	46
Nelson and Revelstoke—	Old rates	303	253	202	158	140	133	73
	New rates	251	209	167	126	115	104	61

Local grain and flour rates are substantially reduced by two methods, first by a direct reduction ranging from 20 to 30%, and secondly by making the terminal Fort William rates the maximum that may be charged between intermediate stations. For example, Broadview to Winnipeg, now 20c., becomes 15c. per 100 lbs.; and Calgary to Winnipeg, now 43c., through the application of the Fort William rate as maximum, becomes 24c. The westbound rates on flour and other grain products are similarly reduced. This is an endorsation of the complaint of the United Farmers of Alberta,

and the application of the Winnipeg Board of Trade. The United Farmers of Alberta also win in their application for reduced rates on these products to British Columbia stations.

Coal rates from Lethbridge and other Alberta mines are substantially cut; for example, from Lethbridge to Calgary from $1.80 a ton to $1.45; to Edmonton from $2.85 to $2.20; Swift Current, $2.40 to $1.90; Regina, $3.10 to $2.65; Virden, $4.10 to $3.40; Saskatoon, $3.95 to $3.30 a ton. From the Souris mines, reductions made by the Board in the Alameda case are confirmed and others made. Thus, from Estevan to Brandon from $1.70 to $1.40; to Carberry, $1.90 to $1.50; Emerson, $2.30 to $2.00; Rapid City, $2 to $1.60; Swift Current, $2.15 to $1.70; Colonsay, $2.40 to $1.80; Saskatoon, $2.60 to $2.10; Yorkton, $2.80 to $2.20. From Merritt, B.C., to Yale, from $1.80 to $1.65; to Kamloops, from $2 to $1.75; to Sicamous, from $2.50 to $2.20; to Penticton, from $3.30 to $2.90; to Nelson, from $4.10 to $3.65.

Carload sugar rates from Raymond, Alta., to prairie points also receive attention, Lethbridge being reduced from 11c. to 9c.; Cranbrook, 42c. to 38c.; Nelson, 60c. to 51c.; Calgary, 31c. to 23c.; Edmonton, 42c. to 37c.; Regina, 50c. to 42c. per 100 lbs. The special mileage rates on butter, cheese and eggs, dressed meats and dressed poultry between all prairie points come in for reductions. The special mileage tariffs on vegetables in Manitoba are shown to be reasonable; the rates, however, in Saskatchewan and Alberta, which are on a somewhat higher scale, are reduced to the Manitoba basis. The special rates on fruits and vegetables from British Columbia, which have been revised and reduced since the complaint against them by the United Farmers of Alberta, are left untouched. The rates on cement from Winnipeg are shown to vary little from those of Ontario, and are not reduced, but the higher rates from cement plants in Alberta and Saskatchewan are reduced to the Winnipeg scale. Lumber and joiners' work from British Columbia to prairie destinations have been already reduced following the Board's order in July, 1913. A table showing some of the reductions accompanies the judgment. The rates on sugar from Vancouver remain unchanged, the complaint of the British Columbia Sugar Refinery not being sustained. No reduction is made in livestock rates, which are shown to be reasonable in view of the favorable carload minimum weights and the volume of traffic. The rates on fence posts, firewood, brick, stone, gravel and sand are found to be generally lower than those applying in Ontario; but the higher scales prevailing in Alberta and Saskatchewan are reduced to the lower Manitoba basis. Rates on ores, concentrates, and smelter products, in and from British Columbia, are found to constitute a large percentage of the traffic of that Province, and are found remunerative only in the sense of contributing to the general prosperity. The rate on pig iron from Port Arthur and Fort William to Winnipeg is reduced from 20c. per 100 lbs. to $3 per gross ton.

A review of the judgment shows that the whole structure of western rates, starting from the standard maximum mileage scale, the class tariffs from Lake Superior and Pacific Coast terminals, the class distributing rates, commodity tariffs applying on grain, coal, livestock, cement, fruit, vegetables, brick, sand stone, lumber, dairy products, etc., have been closely inspected and definite decisions given in connection with each.

The Board has considered the question of local passenger rates in British Columbia very carefully. It finds that the local passenger business is being conducted at a loss. It, therefore, does not feel justified in directing any change until it is afforded an opportunity of seeing what improvement in passenger revenues will result from the improvement in railway grades and operating facilities which the railway is at present making.

Owing to the large amount of space which had to be devoted to the foregoing matter, the usual summaries of all orders passed by the Board, and the completed traffic orders have had to be omitted, but will appear next month.

Railway Rolling Stock Notes.

The G. T. R. has received 400 box cars from Eastern Car Co., and 10 box cars from Western Steel Car and Foundry Co.

The G. T. R. has ordered 1 dining car and 1 parlor buffet car from Canadian Car and Foundry Co.; and 2 dining cars and 1 parlor buffet car, from Pullman Co.

The Pacific Great Eastern Ry. has ordered one 250 h.p. passenger motor car from California, and 3 trailer cars from Canadian Car and Foundry Co.

The Canadian Northern Ry., between Mar. 13 and Apr. 13, received 7 first class cars from Canadian Car and Foundry Co., and 2 consolidation locomotives from Canadian Allis Chalmers, Ltd.

The C. P. R., between Mar. 15 and Apr. 15, received the following additions to rolling stock,—39 steel frame box cars, and 1 steel colonist car, from its Angus Shops; and 149 steel frame box cars, from Canadian Car and Foundry Co.

The Imperial Oil Co., Sarnia, Ont., has ordered 100 tank cars, underframes and trucks, 40 tons capacity, and 10 three compartment tank cars, underframes and trucks, 30 tons capacity, from Canadian Car and Foundry Co., for delivery during May.

The Pacific Great Eastern Ry. has ordered 3 cabooses, 3 refrigerator cars, 5 stock cars and 10 all steel ballast cars, from National Steel Car Co.; 3 steel passenger cars from Canadian Car and Foundry Co., and one gasoline motor car in San Francisco, Cal.

The Dominion Parliament has voted the following amounts for rolling stock, etc., for the Canadian Government Railways:—Rolling stock, $166,666.66; safety appliances, $2,333.33: to improve triple valves on airbrakes, $1,191.67; electric equipment for charging electric lighted cars, $166.67.

The Canadian Engineer of Apr. 16 announced that a contract had been awarded by the C. P. R. to the "New Glasgow Car Works" for the construction of 180 steel cars. We were officially advised by the C. P. R. management Apr. 22 that no such order had been placed.

The Intercolonial Ry. has received the following additions to rolling stock,—143 box cars, 60,000 lbs. capacity, from Canadian Car and Foundry Co.; 14 vans, from Nova Scotia Car Works; 4 first class cars, from Preston Car and Coach Co.; 4 consolidation locomotives from Canadian Locomotive Co., and 2 consolidation locomotives from Canadian Allis Chalmers, Ltd.

The Canadian Car and Foundry Co., during March, delivered the following rolling stock,—Canadian Northern Ry., 10 first class cars; C. P. R., 259 steel frame box cars; Cape Breton Coal, Iron and Ry. Co., 5 fifteen ton wood hoppers; Dominion Coal Co., 25 fifteen ton wood hoppers; Intercolonial Ry., 165 thirty ton steel frame box cars, and Montreal Tramways Co., 10 steel underframe street cars.

The Edmonton, Dunvegan and British Columbia Ry. has ordered one mogul (2-6-0) locomotive from Canadian Locomotive Co. Following are the chief details,—

Weight in working order on drivers	112,800 lbs.
Weight in working order, total	129,500 lbs
Wheel base, rigid	12 ft. 6 ins
Wheel base, engine, total	20 ft. 6½ ins.
Wheel base, engine and tender	49 ft. 3¾ ins.
Heating surface, firebox	133 sq. ft.
Heating surface, tubes	1,301 sq. ft.
Heating surface, total	1,434 sq. ft.
Driving wheels, diar.	50 ins.
Driving wheel centres	Cast iron.
Driving journals	8½ by 12 ins.
Cylinders, diar. and stroke	19 by 26 ins.
Boiler, type	Extended wagon top.
Boiler pressure	180 lbs.
Tubes, no. and diar.	240-2 ins.
Tubes, length	10 ft. 5¼ ins.
Injectors	Two, locomotive type.
Safety valves	Two 3 ins.
Brakes	Westinghouse.
Packing	Metallic.
Weight of tender, loaded	115,400 lbs.
Tank capacity	5,000 imp. galls.
Fuel capacity	9 tons.
Truck, type	4 wheeled arch bar.
Wheel, diar.	Cast iron, 33 ins.
Journals	5 by 9 ins.
Brake beam	Steel.

The City of Winnipeg has ordered one mogul (2-6-0) locomotive from Canadian Locomotive Co., in connection with the construction of its new water supply system. The price is $13,400. Following are the chief particulars,—

Weight on drivers	113,000 lbs.
Weight, total	130,000 lbs.
Wheel base, rigid	12 ft. 6 ins.
Wheel base, total	20 ft. 6½ ins.
Wheel base, engine and tender	49 ft. 3¾ ins.
Heating surface, firebox	133 sq. ft.
Heating surface, tubes	1,301 sq. ft.
Heating surface, total	1,434 sq. ft.
Driving wheels, diar.	50 ins.
Driving wheel centres	Cast iron.
Driving journals	8½ by 12 ins.
Cylinders, diar. and stroke	19 by 26 ins.
Boiler, type	Extended wagon top.
Boiler pressure	180 lbs.
Tubes, no. and diar.	240-2 ins.
Tubes, length	10 ft. 5¼ ins.
Injectors	Two locomotive type.
Safety valves	Two 3 ins.
Brakes	Westinghouse.
Packing	Metallic
Weight of tender loaded	115,400 lbs.
Tank capacity	5,000 imp. galls.
Fuel capacity	9 tons.
Truck, type	4 wheeled arch bar
Wheel, diar	Steel tired, 33 ins.
Journals	5 by 9 ins.
Brake beam	Steel.

Following are chief details of the 10 Pacific (4-6-2) type locomotives, class S246 and S247, which the Intercolonial Ry. has ordered, from Montreal Locomotive Works, as mentioned in our last issue,—

Cylinders, diar. and stroke	23½ by 28 ins.
Tractive power	32,400 lbs.
Factor of adhesion	4.86
Wheel base, rigid	13 ft. 0 ins.
Wheel base of engine, total	33 ft. 10 ins.
Wheel base, engine and tender	66 ft. 6¾ ins.
Weight, total	247,100 lbs.
Weight on drivers	157,600 lbs.
Weight on trailers	45,000 lbs.
Weight on engine truck	44,500 lbs.
Weight, total, engine and tender	397,700 lbs.
Boiler, type	Straight top, radial stay.
Boiler diar. first ring	72 ins.
Boiler pressure	180 lbs.
Firebox, length and width	108 by 75¼ ins.
Tubes, no. and diar.	205-2 ins.; 28-5⅜ ins.
Tubes, length	20 ft. 6 ins.
Heating surface, tubes	2,994.3 sq. ft.
Heating surface, firebox	188 sq. ft.
Heating surface, total	3,182.3 sq. ft.
Superheating surface	691 sq. ft.
Grate area	56.4 sq. ft.
Cab vestibule	C. P. R. style.
Wheels, diar.	Outside 73 ins; centre 66 ins.
Wheels, material, driving	Cast steel.
Wheels, engine truck	34 ins. w. i. centre, steel tire.
Wheels, trailing	48 ins.; c.s. centre, steel tire.
Wheels, tender	36 ins.; w. i. centre, steel tire.
Driving journals, main	10 by 13 ins.
Truck journals	6½ by 12 ins.
Trailing journals	8 by 14 ins.
Tender journals	5½ by 10 ins
Journal boxes	Cast steel.
Brakes	Westinghouse American
Engine truck	Standard 4-wheel.
Trailing truck	Cole radial, outside journals.
Grates	I. R. C. standard cast iron, operated by Franklin shakers.
Water capacity	6,500 imp. galls.
Coal capacity	12 tons.

Railway Finance, Meetings, Etc.

Atlantic and Lake Superior Ry.—A general meeting of holders of certificates of participation in the A. and L. S. Ry. trust funds was held in Montreal, April 25, to value the assets to be distributed in kind; to alter paragraph 42 of the constitution and regulations for the management of the fund, so as to permit a distribution among the different classes in the manner resolved upon by general and separate meetings held Dec. 6, 1910, and to make a total or partial distribution of the same, and further that separate meetings of the holders of preference, ordinary and deferred certificate holders will be held consecutively in the same place on the same day, to agree to the valuation of the assets. J. Degalindey is chairman of the committee of management.

Canadian Pacific Ry. Not Borrowing.—Sir Thos. Shaughnessy is credited with saying recently:—"The C.P.R. will have no need to borrow further money for some time to come. A great deal of money will be spent this year for construction purposes; yet we have a good deal of money in our treasury for this purpose. The C. P.R. has been spending more money on its lines than it has borrowed; but it always has the debenture stock to fall back upon, and there are plenty of people who will eagerly buy this up."

Grand Trunk Pacific Ry.—Tenders are under consideration for the purchase of ten blocks of land, comprising in all about 625,000 acres of land along the company's branch line between Fort William and Graham, Ont. This comprises the lands granted by the Ontario Legislature in respect of the construction of the line. G. U. Riley, Land Commissioner, Winnipeg.

Grand Trunk Ry.—At the ordinary general half yearly meeting of shareholders in London, Eng., April 29, resolutions were submitted assenting to and accepting two acts of the Dominion Parliament, entitled respectively the G. T. Act 1914, and G. T. and Canada Atlantic Amalgamation Act, 1914, and authorizing the directors to exercise the powers conferred by these acts.

Intercolonial Ry.—In presenting the report of the Department of Railways and Canals to the House of Commons recently, the acting Minister said it was estimated that the receipts for the year ended Mar. 31, would amount to $12,632,973.17, and the estimated expenditure to $12,328,000, leaving a net surplus of about $300,000, which would be transferred to renewal of equipment account. This surplus was less than that for the financial year ended Mar. 31, 1913, but it was to be largely accounted for by the fact that there had been a large increase in the cost of operation during the first eight months of the year amounting in all to $783,000. During the past fiscal year there had been added to equipment renewal account, $300,000; to rail renewal account, $150,000 and to fire renewal account, $60,000. The average revenue per month had been $1,066,914.43 against $998,706.89 for the previous year; while the operating expenses averaged $1,041,574.84, against $998,831.87. The figures for February and March were estimated, and subject to revision.

Kingston and Pembroke Ry.—A duplicate original of an indenture made between W. F. Nickle, K. C., Kingston, Ont.; the K. and P. Ry. Co., and the C. P. R., dated Feb. 25, has been deposited with the Secretary of State at Ottawa. The document conveys to the K. and P. Ry. Co. the franchise, undertaking and all other property of the company, conveyed to R. V. Rogers under a trust deed dated Dec. 31, 1898. This is a discharge of an old mortgage, and signalizes the final transfer of the line to the C. P. R.

Lake Huron and Northern Ontario Ry.—G. P. McCallum, President of the Lake Huron and Northern Ontario Ry., disclaims any knowledge of the Boston parties offering bonds of the Lake Huron and Northern Ontario Co., and says that they are making entirely unwarranted statements in connection therewith, and that many of the statements are absolutely untrue and unauthorized. He repudiates all knowledge of the circular letter which is accompanying the offering of the bonds and states that the company has not yet issued bonds or securities of any kind. This circular was the subject of a short debate in the Ontario Legislature recently. The leader of the Opposition read the article to the House, and drew the attention of the Minister of Lands, etc., to the charge that the company was claiming to have the guarantee of the province back of its bonds, and was booming its stock as another C.P.R. bonanza. He asked if the Minister was acqualnted with the facts. Mr. Hearst promised to look into the matter, and at the night session read a letter from the company's solicitor in which he stated that no such prospectus as that alluded to had been issued by the company. The Minister promised to look into the matter further, and assure himself that no company, particularly one having any connection with the Government, was making improper representations.

Maritime Coal, Ry. and Power Co.—The annual meeting was held in Montreal, April 18, W. Hanson, President, in the chair. The net profits for the financial year were reported to be $116,000, an increase of 16% over those of the previous year. It is proposed during this year to largely increase the plant at the collieries. The directors were re-elected, and the following officers were elected:—President, W. Hanson; Vice President, A. E. Dyment, Toronto; Secretary, R. Wilson, Jr.

New Brunswick Coal and Ry. Co.—The New Brunswick Legi lature has passed an act providing for the issue of debentures amounting to $212,175.54 bearing 4½% interest, for the purpose of providing for the liabilities of this railway. The line came under the control of the N. B. Government in 1908, and was taken over by the C. P. R. June 1, 1913. During that period the following deficiencies accumulated: Financial year 1909, $30,000; 1910, $48,919; 1911, $66,000; to June 1, 1913, $67,260.49. The deficiencies to the end of the financial year of 1911 were provided for by means of temporary loans, and that to June 1, 1913, by an overdraft. The balance of the amount of $212,175.54 is made up of the amount of the Dominion Government's claim for rails and materials furnished to the company prior to the line being taken over by the N. B. Government. The act provides for the provision of a sinking fund out of the consolidated fund of the Province to meet the debentures at maturity.

New York Central Lines in Canada.—There has been deposited with the Secretary of State at Ottawa an agreement, supplemental to a lease dated April 23, 1912, between the Guaranty Trust Co. of New York, as trustee, and the New York Central and Hudson River Ry., the Lake Shore and Michigan Southern Ry., the Michigan Central Ry., and the Cleveland, Cincinnati, Chicago and St. Louis Ry., under the New York Central Lines Equipment trust of 1912, with respect to the rolling stock used on the company's lines in Canada.

Pere Marquette Rd. Bond Interest Default.—New York press dispatch, April 1:—"The Pere Marquette Rd. Co., now under receivership, defaulted in its semi annual interest on $5,000,000 bond due today. J. P. Morgan and Co., who have been the fiscal agents of the road, said they made no interest payments, and other banking interests identified with the property know of no interest disbursements. The bonds under default are divisional issues of the old Flint and Pere Marquette Rd., $1,000,000 of which bears 4% interest, and the remaining $4,000,000 6%. The amount defaulted is $140,000."

On April 2 foreclosure proceedings were started at Detroit, Mich., by the Farmers' Loan and Trust Co. of New York, which is said to hold $2,850,000 of the bonds.

Lake Huron and Northern Ontario Ry.—A bond issue of $1,000,000 is reported to have been placed on the New York and Boston markets. The company was voted a large area of land for colonization purposes by the Ontario Government, on condition that the old Bruce Mines and Algoma Ry., which was taken over, be extended to a junction with the National Transcontinental Ry. The attention of the Ontario Government has been called to statements made in the prospectus as to the value of the land grant, which is asserted to be $8 an acre.

Prince Edward Island Ry.—The estimated earnings for the financial year ended Mar. 31, were stated recently by the acting Minister of Railways, in laying the report of the Department before the House of Commons, to be $410,000, and the expenditure $555,000. The deficit of $145,000 is an increase over that for the financial year ended Mar. 31, 1913, and is due largely to the increased cost of labor and material.

Temiscouata Ry. Gross earnings for Jan., $22,930; operating expenses $18,904; net earnings $4,026, against $18,729.16 gross; earnings; $14,877.36 operating expenses; $4,851.80 net earnings, for Jan., 1913.

White Pass and Yukon Route. Gross earnings from Jan. 1 to Mar. 7, $37,827, against $47,689 for same period, 1913.

One of Sir William Whyte's Jokes.—"A Manitoba Free Press reporter discussed one day with the late Sir William Whyte the great number of claims preferred against the railway by reason of horses and cattle killed by trains. He remarked the peculiar fact that practically every animal killed figured in the claims as thoroughbred stock. 'Do you know,' said Sir William, 'I have reached the conclusion that nothing in this country so improves live stock as crossing it with a C. P. R. locomotive.'"

Moncton and Buctouche Ry.—We are officially advised that the railway extending from Moncton to Buctouche, N. B., 32 miles, is still being operated under the title of the Moncton and Buctouche Ry. The transfer of the line and other property to the Moncton and Northumberland Strait Ry., originally incorporated as the Buctouche Ry. and Transportation Co., has not been made.

Canadian Aviation Co., Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital and office at Toronto, to build and deal in aeroplanes, hydroplanes, flying machines and air and water craft, and "to carry on the business of an aircraft navigation company." W. A. Dean, C. J. Hevey and W. J. and H. L. McCallum, Toronto, are among the incorporators.

C. P. R. Medical Service.—Arrangements have been completed for the establishment of a new plan for medical service on the C. P. R. lines in British Columbia, and a meeting of the employes was held at Revelstoke, April 17, for the purpose of adopting a constitution, electing officers, and placing the new system on a working basis.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Alberta Central Ry. J. G. REID has been appointed Assistant Engineer, vice J. Grant MacGregor, who has been appointed Consulting Engineer. This line is a C. P. R. subsidiary.

Canada Steamship Lines, Ltd. W. J. KING has been appointed Agent at Montreal.

C. D. SECORD, heretofore master of the Pittsburgh Steamship Co.'s s. s. Rensselaer, has been appointed Assistant Superintendent, Toronto.

I. B. McCONNELL has been appointed Agent, Yonge St. Wharf, Toronto.

F. MITCHELL has been appointed storekeeper in charge of Toronto stores, Yonge St. Wharf, Toronto.

A. ROSS has been appointed Accountant, Passenger Steamers, Yonge St. Wharf, Toronto.

J. J. HENNIGAR, heretofore General Agent, Richelieu and Ontario Navigation Co., Hamilton, Ont., has been appointed Agent, Canada Steamship Lines, Ltd., there.

J. J. BURKE has been appointed Agent at Fort William, Ont.

Canadian Government Railways.—J. C. BECKWITH has been appointed Engineer of Construction, Intercolonial Ry. and Prince Edward Island Ry., vice H. M. Killaly, deceased. Office, Moncton, N. B.

Canadian Northern Ry. A. W. SYMES, heretofore Soliciting Freight Agent, Montreal, has been appointed Travelling Freight Agent, Toronto.

G. M. ARGUE, heretofore Car Foreman, North Battleford, Sask., has been appointed Car Foreman, Fort Frances, Ont., vice E. W. Winnebeck resigned.

R. B. McINTOSH, heretofore chief clerk, District Freight Office, Saskatoon, Sask., has been appointed chief clerk, General Freight Office, Winnipeg.

B. R. MARSALES, heretofore Contracting Freight Agent, Brandon, Man., has been appointed District Freight Agent, Regina, Sask.

A. BROSTEDT, heretofore District Freight and Passenger Agent, Great Northern Ry., Winnipeg, has been appointed Division Freight Agent, C. N. R., Calgary, Alta.

Canadian Pacific Ry. H. C. GRIFFIN has been appointed General Car Inspector, Eastern Lines, vice L. C. Ord, whose appointment as Assistant Master Car Builder, was announced in a recent issue. Office, Montreal.

J. AITKEN, heretofore Locomotive Foreman, Magantic, Que., has been appointed Locomotive Foreman, Sherbrooke, Que., vice C. W. Stackhouse transferred.

G. C. JACKSON has been appointed Auditor of Claims. Office, Montreal.

C. W. STACKHOUSE, heretofore Locomotive Foreman, Sherbrooke, Que., has been appointed Locomotive Foreman, Angus Shops, Montreal, vice W. Wood.

D. I. THORNTON has been appointed Shop Engineer, Car Department, Angus Shops, Montreal.

E. J. HARVEY has been appointed Assistant Shop Engineer, Car Department, Angus Shops, Montreal.

N. BERGER, heretofore Assistant Roadmaster at Farnham, Que., has been appointed Roadmaster, Farnham and Sherbrooke Subdivisions, Eastern Division, vice O. Kirkland transferred. Office, Farnham, Que.

J. H. DUFF has been appointed Chief Dispatcher, Farnham, Que., vice J. J. Morgan.

G. BRIMACOMBE has been appointed Locomotive Foreman, Sortin Yard, Montreal, vice W. Wood transferred to Angus Shops.

JAMES WEIR has been appointed Night Locomotive Foreman, Outremont, Que.

L. CLEARY has been appointed Assistant Locomotive Foreman, Outremont, Que.

C. E. SARNEY, heretofore Assistant Foreman, Outremont, Que., has been appointed Locomotive Foreman, Megantic, Que., vice J. Aitken transferred.

O. KIRKLAND, heretofore Roadmaster, Farnham and Sherbrooke Subdivisions, Eastern Division, Farnham, Que., has been appointed Roadmaster at Smiths Falls, Ont.

K. A. DUNPHY, heretofore Resident Engineer, Calgary, Alta., has been appointed Resident Engineer, Saskatoon, Sask.

E. B. SKEELS has been appointed Resident Engineer, Calgary, Alta., vice K. A. Dunphy transferred.

G. H. RAWLINS, Manager, Banff Springs Hotel, is reported to have been appointed Manager, Hotel Palisser, Calgary, Alta.

B. WILSON has been appointed storekeeper at Strathcona, Alta., vice G. M. Keates transferred to Mechanical Department.

C. BRADLEY has been appointed storekeeper at Coquitlam, B. C., vice J. H. Waters transferred.

P. H. WATERS, heretofore storekeeper at Coquitlam, B. C., has been appointed storekeeper at Vancouver, B. C.

A. G. G. LAUDER, heretofore Freight Agent, has been appointed District Freight. Agent. Office, Milwaukee, Wis.

W. M. PORTEOUS, heretofore Freight Agent, has been appointed District Freight Agent. Office, St. Louis, Mo.

L. C. JACK, heretofore Freight Agent, has been appointed District Freight Agent. Office, Kansas City, Mo.

E. EDEN, heretofore Freight Agent, has been appointed District Freight Agent. Office, Omaha, Neb.

Chicago Great Western Ry. CHARLES A. FULLEN, heretofore General Agent, Fargo, N. D., has been appointed General Agent, Winnipeg, Man., vice Roy Bullen, resigned to enter G. T. R. service as announced in our last issue. Office, 195 Portage Ave. East.

Grand Trunk Pacific Ry. The following station agents have been appointed,—Justice, Man., J. E. Porter; Spy Hill, Sask., W. Thresher; Ituna, Sask., P. D. Hamilton; Young, Sask., J. T. Scott; Griffin, Sask., J. R. Wilson; Stoney Plain, Alta., D. J. Harnet; Bashaw, Alta., J. W. LeGallais; Battleford, Alta., R. L. Harrop; Coalspur, Alta., D. S. McCready; McBride, B. C., A. E. Robin.

Grand Trunk Ry. V. G. SNELL, heretofore Soliciting Freight Agent, Montreal, has been appointed Commercial Agent, Moncton, N. B., vice W. J. P. McGregor, transferred to G. T. Pacific Ry. service.

F. W. BERGMAN, General Manager, G.T.R. and G.T. Pacific Ry. hotels, Ottawa, Ont., has resigned, effective May 1. At the time of going to press, no appointment of a successor has been made.

JAMES CAMPBELL, heretofore Yard Foreman, York, Ont., has been appointed Supervisor of Track, Hamilton to Niagara Falls, and Port Dalhousie to Port Colborne, vice G. Stilson, deceased. Headquarters, Hamilton, Ont.

C. STEWART has been appointed Telephone Inspector at Stratford, Ont., vice G. G. Murray transferred.

G. G. MURRAY, heretofore Telephone Inspector, Stratford, Ont., has been appointed Telephone Inspector, St. Thomas, Ont.

F. G. ADAMS, heretofore Division Freight Agent, G. T. Pacific Ry., Edmonton, Alta., has been appointed Commercial Agent, G. T. R., Winnipeg, vice W. J. Hunter, deceased.

The following station agents have been appointed,—Millbrook, Jct., Ont., G. H. Raymes; Canfield, Ont., W. G. McCulla; outside agency, Toronto, W. J. Moffatt.

Great Northern Ry. A. R. BROOKS has been appointed District Freight and Passenger Agent, Montreal, vice W. T. Hetherington, transferred to Winnipeg.

W. T. HETHERINGTON, heretofore District Freight and Passenger Agent, Montreal, has been appointed District Freight and Passenger Agent, Winnipeg, vice A. Brostedt, resigned to enter Canadian Northern Ry. service.

Intercolonial Ry. JAMES W. BARNETT has been appointed Tariff Inspector and Assistant Weighing Inspector. Headquarters, Moncton, N. B.

Northern Pacific Ry. STANLEY EDWARDS has been appointed Soliciting Agent, Montreal, vice J. W. Maver resigned.

Pacific Great Eastern Ry. With reference to press reports stating that R. J. McDONALD has been appointed External Architect we are officially advised that there is no knowledge of such an appointment at the offices at Victoria, B. C.

Pere Marquette Rd. Effective Apr. 1, the system has been divided into four operating divisions, comprising the Chicago-Petoskey Division, Superintendent, J. W. MULHERN, Grand Rapids, Mich.; General Agent and Superintendent of Terminals, C. HARSCH, Chicago, Ill.; Toledo-Ludington Division, Superintendent, E. E. CAIN, Saginaw, Mich.; Port Huron-Grand Rapids Division, Superintendent, J. L. HAYES, Saginaw, Mich.; Detroit-Canadian Division, comprising Grand Rapids to Detroit, Oak to West Detroit, Walkerville to St. Thomas, Sarnia to Rondeau, London to Port Stanley, Black Rock and Suspension Bridge terminals and ferry operation between Detroit and Windsor, Superintendent, J. J. CORCORAN, Detroit, Mich.; Assistant Superintendent, Canadian Lines, R. S. BLACK, heretofore Trainmaster. Office, St. Thomas, Ont.

W. K. TASKER, heretofore Superintendent, Canadian Division, St. Thomas, Ont., has been appointed Superintendent of Telegraph, vice W. M. Hayes transferred. Office, Detroit, Mich.

Prince Edward Island Ry.—See Canadian Government Railways.

Quebec, Montreal and Southern Ry., Napierville Jct. Ry.—A. L. CURRIE, heretofore Secretary to the company, has been appointed Superintendent, vice J. E. Roberts, appointed General Superintendent, Greenwich and Johnsonville Ry., Greenwich, N. Y. Office, Sorel, Que.

T. BRENNAN has been appointed General Roadmaster, Sorel, Que.

Timiskaming and Northern Ontario Ry. GEORGE W. LEE, heretofore General Agent, North Bay, Ont., has been appointed a Commissioner, vice F. Dane, resigned, on his appointment as Trade Commissioner, Dominion Government, Glasgow, Scotland.

Toronto, Hamilton and Buffalo Ry. H. T. MALCOLMSON, heretofore Superintendent Car Service, has been appointed Superintendent, vice R. A. Barrett, resigned. Office, Hamilton, Ont.

A. E. LOCK, heretofore Commercial Agent, has been appointed Car Accountant, vice H. T. Malcolmson, Superintendent Car Service, promoted. Office, Hamilton, Ont.

White Star-Dominion Line, Canada Line, Austro-American Line. R. F. MACFARLANE, who was formerly identified with the Dominion Line, and latterly with the White

Star-Dominion Line, Montreal, retired Apr. 6, on completion of 40 years active service. The passenger business of the foregoing lines, which has hitherto been jointly managed by P. V. G. MITCHELL and R. F. MACFARLANE, is now in charge of the former.

Canadian Pacific Railway Construction, Betterments, Etc.

Montreal Terminals.—A press report states that among the plans under consideration is one for the electrification of the Windsor St. terminals, Montreal.

Campbellford, Lake Ontario and Western Ry.—The work of finishing up this line from Glen Tay to Agincourt, Ont., 182 miles, has been resumed, and it is expected that everything will be completed so as to permit of its opening for operation by July 1.

Humber River Bridge.—The bridge across the Humber River, near Toronto, is a single track one and is the only piece of single track on the line from Toronto west to Guelph Jct., 39 miles. The bridge is 471 ft. long, and consists of three Pratt truss spans of 157 ft. each, at a height of 100 ft. above average low water. The abutments and the two piers of the present bridge are of masonry. The reconstruction of the bridge was decided upon some time ago, but the work is just now being placed in hand. It is proposed to reconstruct the bridge as one, of six spans of 78½ ft. of the deck plate girder type. To do this it is necessary to widen and raise the abutments and piers of the present bridge, and to build three new piers. All the new work on the substructure is to be of concrete. The new piers will be numbered 1, 3 and 5. Numbers 1 and 4 will be built on foundations 24½ ft. by 13 ft., at the base, tapering to 29½ by 7½ ft., and 66 ft. in height. Pier number three, which will be in the middle of the river, will be built on a foundation 50½ by 14½ ft. over all, to 16 ft. above low water, and then tapering to 28 by 7½ ft., with a height of 84 ft. The other two piers, 2 and 4, will have foundations 50½ by 14 ft. over all, including foundation of present piers, and will be tied into the present piers, the whole tapering to 29 by 7½ ft., with a height of 72 ft. The abutments are to be built into the existing abutments. So far as the new work is concerned, it is to be completed underneath the height of the present truss spans, but otherwise to the full height. The contract calls for the completion of this part of the work by Sept. 1. The new steel superstructure for the westbound tracks will be put in position and the track laid, then the traffic will be switched over, the present superstructure removed, and the abutments and piers raised so as to permit the putting in place of the new deck plate girder spans for the eastbound tracks. It is expected that the work will be completed by Dec. 31. The estimated quantities are:—Excavation and trackfilling, 1,300 cubic yards; wet excavation, 250 cubic yards; loose rock and stone, 200 cubic yards; concret piling where necessary, 900 ft; concrete, 5,000 cubic yards. The contract for the substructure has been let to the Kennedy Construction Co., Montreal, and preparations are being made for starting work. The company is putting in a siding on the west bank of the river, on the north side of the line, to facilitate the work, which will be under the charge of J. A. Irvine, Resident Engineer, Toronto Terminals.

Lake Superior Division.—D. McNicoll, Vice President, is reported to have said at Toronto, April 12, that the work of building a second track along the north shore of Lake Superior would be further proceeded with, and that eventually the entire line from North Bay to Port Arthur will be a double track one.

Manitoba Division.—The Winnipeg City Council, April 7, approved plans for the building of a subway under the C. P. R. tracks at Salter St. It is not intended to build the subway this year, but to expend about $60,000 on the approaches. The subway will be gone on with in 1915, unless the advocates of an overhead bridge are able to secure a change in the decision.

The Bergen cut off, which extends from west of Winnipeg into the Transcona yards, is expected to be put in operation, May 1. This will relieve the congestion in the Winnipeg yards, as traffic going through between points east and west will be sent by the cut off.

Saskatchewan Division.—George Bury, Vice President, is reported to have said in the course of a recent interview, it is the intention to proceed this season with the construction of the projected line from Expanse to Assiniboine, where it will connect with the Weyburn-Lethbridge line, and that it is also intended at some time to extend the line from near Expanse to Vanguard, to connect there with the line from Swift Current. The engineers are at present working westerly from Vanguard on this extension.

Alberta Division.—It is expected that the Weyburn-Lethbridge Branch will be completed this year. Construction is proceeding westerly of Shaunavon, Alta., a long stretch of grade is ready for tracklaying, and the material for this is being rushed in.

Additional gangs of men have been put to work on the cut off between Swift Current and Bassano, which it is expected to complete this year. Grading is reported to have been completed, and ties have been distributed as far as Gleichen. The steel for tracklaying has been distributed.

The Suffield branch is expected to be extended to about five miles south of the South Alberta Irrigation Co.'s north dam, by the fall.

Rogers Pass Tunnel.—We are officially advised that McIlwee and Sons, of Denver, Col., have been given a contract, by the general contractors, Foley Bros., Welch and Stewart, for driving the "pioneer" tunnel at Rogers Pass, the plant being furnished by the general contractors.

British Columbia Division.—In a recent interview, F. W. Peters, General Superintendent, is reported to have said that among the improvements to be made during this year is the boring of a 500 ft. tunnel, 40 miles west of Nelson, B.C., through a rock point, and will cut off a very sharp curve as well as eliminate a modern bridge. The plans are said to be ready, and it is expected that tenders will be called for on an early date.

The question of the electrification of the line between Vancouver and New Westminister is reported to be under consideration.

Work has been started on the train sheds and platform shelters for the new passenger terminals at Vancouver. The grade is being raised for the new station level and other work is being pushed forward. Practically all the exterior work on the new station has been completed, and several gangs are engaged on the interior work.

Arrangements were being made at the time of writing (April 13) to remove the Dominion Express Co. and the baggage department into their new quarters. When the transfer is completed, the buildings which they at present occupy will be torn down and the area utilized for other purposes. (April, pg. 171.)

Aid Granted to Canadian Northern Railway.

J. H. Burnham, M.P., asked in the House of Commons April 1:—"What aid has been promised, given or otherwise arranged for, directly or indirectly, by the Government to or with the Canadian Northern Ry. Co., or any of its subsidiary lines, or propositions or any part thereof, since the inception of the same?"

In reply the acting Minister of Railways submitted the following statement:—

Canadian Northern Railway.

CASH SUBSIDIES	Granted.	Paid to Dec. 11, 1913.
Swan River section	$ 374,606	$ 374,606
O. & R.R. Ry.	1,534,526	1,534,526
E.Y. & P. Ry.	91,200	91,200
	$ 2,000,332	$ 2,000,332
Canadian Northern Alberta Ry.	$ 3,120,000	$ 2,832,024
Canadian Northern Ontario Railway.		
Toronto-Sudbury	$ 1,872,960	$ 1,872,960
Toronto-Ottawa	1,600,000	1,363,122
Hawkesbury-Ottawa ...	369,872	369,872
Ottawa-Port Arthur	10,920,000	6,518,516
	$14,762,832	$10,124,470
Canadian Northern Quebec Railway.		
Garneau-Quebec	$ 523,820	$ 523,820
St. Jerome branch	97,280	97,280
Rawdon branch	86,468	86,468
	$ 707,568	$ 707,568
Canadian Northern Pacific Ry.	$ 6,300,000	$ 4,349,930
Halifax and South Western Ry.	$ 1,364,210	$ 1,364,210
Total	$28,254,942	$21,378,534

GUARANTEES.	Granted.	Paid to Dec. 31, 1913.
Canadian Northern Ry.	$17,256,584	$15,397,488 36
Canadian Northern Alberta Ry.	6,719,998	4,391,077 30
Canadian Northern Ontario Ry.	35,770,000	20,149,256 53
	$59,746,582	$39,937,822 19

No land was granted direct to Canadian Northern Ry., but this company has received from the contractors for the Lake Manitoba Ry. and Canal Co., the Winnipeg and Hudson Bay Ry. and the Manitoba and South Eastern Ry., 4,002,848 acres.

EDITOR'S NOTE.—The heading of the column of figures under "Guarantees," which reads "Paid to Dec. 31, 1913," is rather misleading, as the Government has not been called on to pay anything in connection with guarantees of C.N.R. bonds. As the guaranteed bonds are sold the proceeds are deposited with the Government and are paid over to the company as the Railway's Department's engineers certify to the amount of work performed.

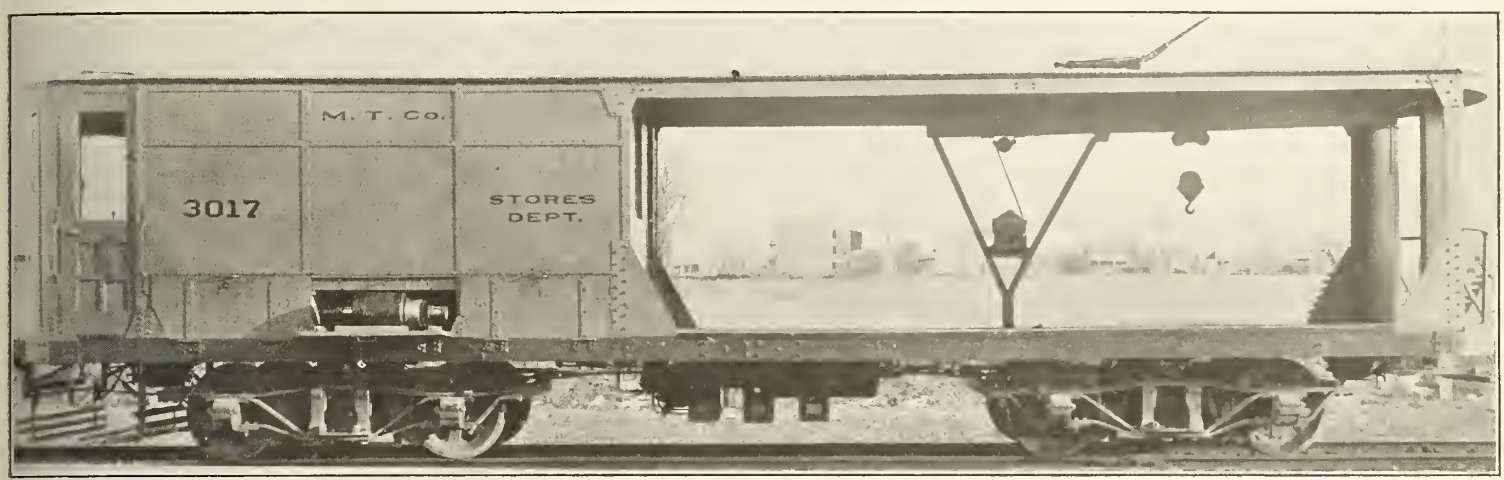
Safety First on G.T.R.—G. Bradshaw, Safety Engineer, states that the G.T.R safety committee is doing most effective work in the prevention of personal injuries. From Sept., 1913, to Feb., 1914, inclusive, there was a decrease of 46% in the number of employes killed and a decrease of 16% in the number injured, including all classes of injury, serious or trivial, as compared with the corresponding months of 1912 and 1913. The safety movement was put into effect on the G.T.R. in Aug., 1913.

The C. P. R.'s Algonquin Hotel. St. Andrews, N. B., was practically destroyed by fire April 11, the damage being estimated at about $500,000. The hotel had been renovated recently, and was ready for opening for the summer season on June 1.

Electric Railway Department

Steel Stores Car for Montreal Tramways Company.

Last autumn, the Montreal Tramways Co. built an all steel stores car, of the design shown in the accompanying illustrations, in its shops at Youville. The design was worked out with the paramount idea of convenience and utility. So well has this been done, that the one car is able to handle the stores for the whole system, carrying them from the main stores at Youville to the several car sheds throughout Montreal, replacing the three stores cars that were formerly used for this purpose. The car makes a complete circuit of the system once a day. The five car sheds are supplied, the daily run being 35 miles. The car cost complete about $1,800.

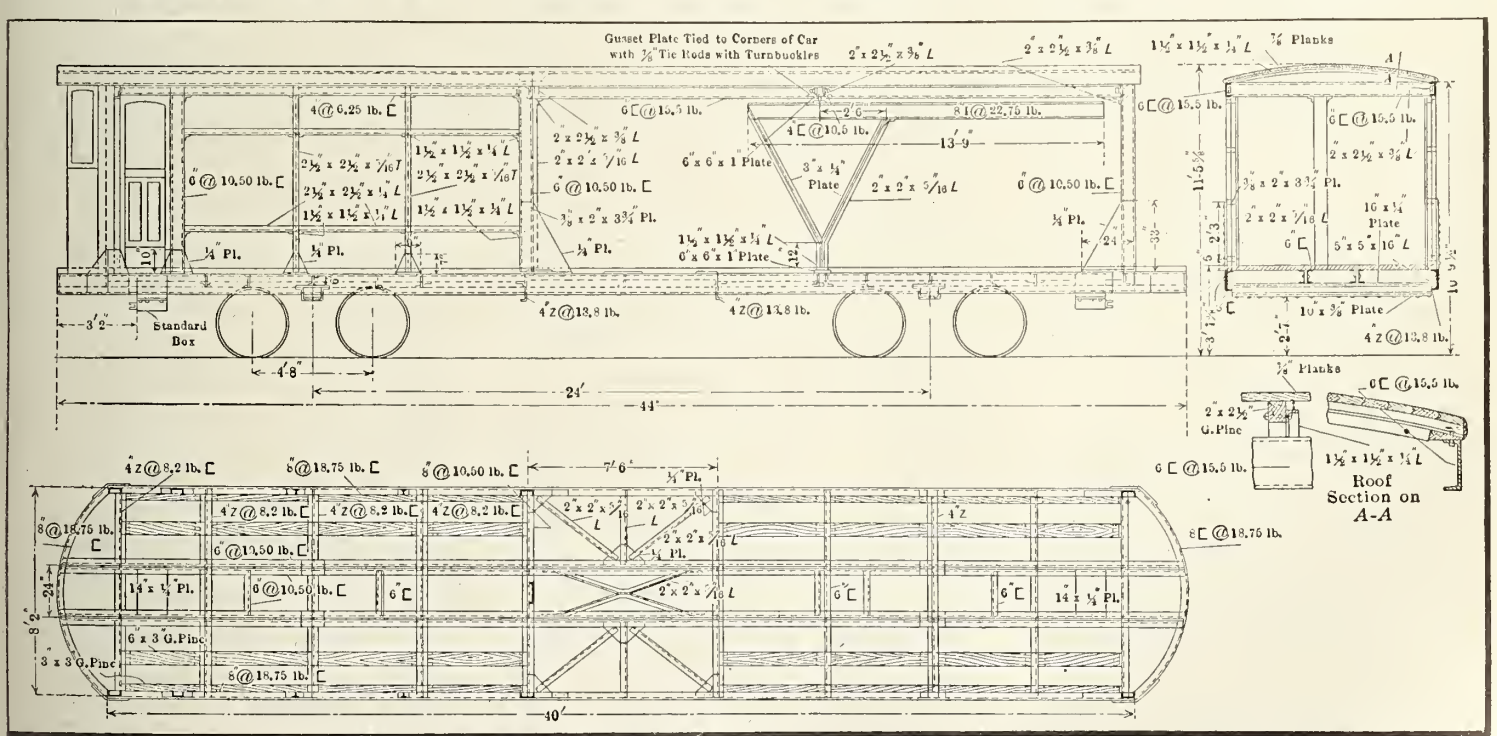


Steel Stores Car, Montreal Tramways Company.

The over all length of the car is 44 ft., with side sills of 8 in. channels, and intermediate sills of 6 in. channels. The roof is supported on side members of 6 in. channels, and is composed of ⅞ in. planking. The forward end of the car is housed in with steel plating, and the section back of the motorman's compartment has a double floor, the upper floor being about 20 ins. above the deck, forming an upper compartment, entered from both the front and rear ends through doors, in which the smaller stores are carried. The lower floor is divided into three lateral compartments, opening to the sides through downwardly swinging doors, and is used for transporting armatures, which are run in from the side as shown in the photograph, making a convenient arrangement for handling these members, and keeping them out of danger of damage in transit.

The rear part of the car is open on the sides, and is used for the heavier stores, for the handling of which there is a centrally located jib crane, pivoted top and bottom, serving the whole interior. The verticals consist of 2 in. angles, and the jib member, of an 8 in. I beam, on which there is a traveller, air operated, and with a capacity for 3,000 lbs., the operating motor being supported in the V of the uprights on a small platform.

The whole car is built of commercial structural shapes and is most solid throughout. The end construction comprises an 8 in. bumper channel, with 6 in. channel corner posts, braced by corner gussets. The trucks are located at 24 ft. centres, and carry four GE-80 motors, controlled by a K-28 controller. The total car weight is 47,600 lbs. The car was built to the designs of D. E. Blair, Superintendent of Rolling Stock, to whom we are indebted for the data on which the foregoing was compiled.



Details of Steel Stores Car, Montreal Tramways Company.

Hydro Electric Power Commission of Ontario and Projected Electric Railways.

The Ontario Legislature has adopted the following resolution dealing with the many proposals now being made for the building of electric railways in rural districts in connection with the Ontario Hydro Electric Power Commission:—"That in the opinion of this house cheap and convenient electric railway transportation facilities is one of the most urgent needs in many rural sections and the towns of the province, and this house is gratified to see the general movement among the municipalities to secure improved electric railway transportation facilities through the Hydro Electric Power Commission. That this house views with satisfaction the prompt manner in which this question has been taken up by the Chairman of the Commission, and would respectfully urge upon the Dominion Government the importance of the question and the wisdom of encouraging the construction of municipal hydro electric radial railways, and that this house further respectfully urges upon the Dominion Government the great importance of co-operating with the province in the development of the water powers created by existing and projected canals and canals now under construction and capable of such development, by the utilization of the waters necessarily supplied thereto and not required for navigation purposes." In addition to the projected line to Port Perry, Whitby, etc., which was the first one suggested to be built under the Commission, meetings in municipalities have been and are being held to advocate he building of lines centering on Guelph, Stratford, St. Marys, London and St. Thomas, which, if built, would serve practically every part of Western Ontario. Engineers are going over many of the routes suggested, with a view of forming conclusions as to such lines as might be built with some prospect of expenses being met.

The most important question to be settled is that of how construction is to be financed and any deficit in operation met. At a meeting of representatives of municipalities at Guelph, Mar. 29, a deputation was appointed to wait on the Ontario Government in order to secure a standard form of agreement to be entered into between the Hydro Electric Power Commission and the municipalities with respect to the building of electric railways. The matter is under consideration by the Government and the Commission. (April, pg. 182.)

Answers to Questions on Electric Railway Topics.

Following are answers to questions in the American Electric Railway Association's question box,. sent in by officials of Canadian electric railways:—

Interurban Fare Collection.—What is the best method of collecting and accounting for fares on interurban lines, the method making it possible for conductors to prevent passengers riding beyond the point to which they have paid, also permitting of an accurate check?

A Gaboury, Superintendent, Montreal Tramways Co.—On suburban cars of this company, no zone collection is made. The conductor collects fares from passenger for full distance he intends to travel, cash or tickets, at the same time issuing a receipt for amount collected. These receipts are of different colors, each color representing a different denomination of fare. The conductor checks his load by means of these receipts. Special ticket checkers, in uniform, also check up the load unexpectedly, thereby keeping conductors up to the mark. Receipts are all numbered in serial numbers, in pads of 50, and conductors have a waybill to make out, entering on it the first and last numbers of each denomination of receipt, and the total number of each denomination issued, and the total amount as shown on trip sheet must correspond with amount in conductor's farebox.

Employment of Platform Men.—What are the advantages, or disadvantages of advertising in cars or elsewhere for men wanted on train service?

A. Gaboury, Superintendent, Montreal Tramways Co.—Am very glad to say we have not, so far, found it necessary to advertise in any way for platform men. The number of men seeking employment on the cars, is such as to allow us to pick and choose those who seem most suitable.

Has any large railway system a bureau covering employment for all departments? If so, does this bureau hire men for each department, or what are its functions?

A. Gaboury, Superintendent, Montreal Tramways Co.—The employment bureau of this company engages only men for platform work for the operating department.

The Ontario West Shore Railway Muddle.

The enquiry, by the Ontario Railway and Municipal Board, into the affairs of the Ontario West Shore Ry., was resumed at Toronto, Apr. 6. At previous sittings, considerable time was wasted owing to the nonproduction of books and papers of the company, which it was alleged had disappeared, and also owing to the absence of J. W. Moyes, the promoter, on whose behalf medical evidence was tendered that he was mentally and physically unfit to present himself for examination. On the resumption of the sittings, it was stated that Mr. Moyes was still too ill to appear. Certain books and papers have been recovered, by the intervention of the police, and have been placed in the hands of accountants for elucidation, and from these the accountants state that only $214,177.46 can be placed as having been properly applied to the company's work. Of this, $74,000 was spent for rails, $8,500 for ties, and about $14,000 for right of way, etc.

On Apr. 7, P. A. Malcolmson, acting for the town of Kincardine, Ont., requested that Mr. Moyes be committed for contempt of court, for not producing all documents and bonds in his possession, although having been subpoenaed to do so, and stated that unless the bonds were produced in court, the municipalities would lose the fruits of the litigation. On behalf of Mr. Moyes, it was claimed that he had not been served with notice to produce the particular papers in question and that he had sworn he did not know where they were. He might be guilty of perjury, but not of contempt. The Chairman agreed that there had been disobedience under the subpoena, and suggested that the facts be submitted in a more formal shape, as he considered the Board had been played with, until by an accident the books being examined came into the Board's possession.

Amongst the papers recovered are the progress certificates, on which payments were made out of the trust funds raised by the sale of bonds guaranteed by the municipalities, and attached to each of the 57 certificates, was a calculation slip showing the method by which the amount stated on the certificate was arrived at. These showed an ingenious method of increasing the amount to be certified. Under the agreements for construction, it appears that two-thirds of the amount of the progress certificates was to be paid out of the trust funds, and the balance by the contractors, and the progress certificates were to represent not more than 90% of the work actually done. The calculations showed that the actual amount expended was treated as the two-thirds portion, sufficient being added to cover the contractors' share, and this inflated amount was certified as 90% of the work actually done.

At a meeting of representatives of the municipalities concerned, at Kintail, Apr. 20, an offer of settlement was made on behalf of J. W. Moyes, but was unanimously rejected, those present deciding that the matter should be pressed to a proper conclusion. The offer was to return to the municipalities $178,000 of unguaranteed bonds, $2,000 in cash, and the railway as it stands at present, comprising right of way, steel and ties laid, all work done, and such equipment as is on the road. It was understood that if the offer had been accepted, the enquiry would have been stopped.

On the resumption of the enquiry at Toronto, Apr. 21, evidence was given by V. M. Roberts, the engineer who signed progress certificates, etc., who stated that he realized that he had done wrong in signing the certificates, but, at the time, he thought he was justified. D. M. McIntyre, Chairman of the Board, stated that the remedy for the nonproduction of the bonds, was with the courts, and continued to the effect that if the board is satisfied that Mr. Moyes' health is all right and he does not appear at the next sitting on May 1, he will be committed. When he appeared before, he took refuge behind the matter of missing papers. It may not be fair to make a report without hearing his explanation, but if he is not in attendance at the next sitting, the enquiry will close.

Statistics of Deaths Due to Street Traffic.

The National Highways Protective Association has compiled a record of deaths due to street traffic in a number of U.S. cities, and which shows how much more deadly automobiles are than street cars. The number of persons killed per million of population are as follows:—

	Automobiles.	Street Cars.	Wagons.
Utica, N.Y.	70	29	0
New York, N.Y.	64	23	36
Buffalo, N.Y.	54	47	21
Albany, N.Y.	40	40	10
Alantic City, N.J.	87	0	0
Trenton, N.J.	52	21	31
Paterson, N.J.	48	8	16
Newark, N.J.	47	18	21
State of New York	50	20	22
State of New Jersey	44	11	10

Woodstock, Thames Valley and Ingersoll Electric Ry.—An order was made by Mr. Justice Middleton, in Toronto, April 22, for the transfer of possession and control of the W., T. V. & I. E. Ry. from E. B. Stockdale, Receiver of the Grand Valley Ry., the parent concern, to J. G. Wallace, of Woodstock, trustee for the bondholders of the road, the transfer to be made April 23. The receiver must pass his accounts before the local master at Woodstock, and that official is directed to allow all accounts paid at the request of the first mortgagee. Mr. Stockdale was ordered to pay the costs of the action, but may reimburse himself out of any funds that may come into his hands belonging to the second mortgagee or mortgagor.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—Work was reported to have been started, April 1, on the building of a second track on the line from Dominion Road to Head St., and from Lampson St. to Admirals Road, Victoria, B.C. It was expected to have the work completed by April 30. Material is being assembled, it is reported, for the extension of the line from Burnside Road to Harriet Road, and a start is expected to be made on the work early in May. Information that these works would be undertaken was given by A. T. Goward, Local Manager, at the recent meeting of the City Council.

An arrangement has been completed between the Victoria City Council, the Provincial Government and the B. C. E. Ry., for the building of what is known as the proposed Johnson St. bridge. The estimated cost of the work has not been ascertained, but the Government has promised to contribute $150,000 and the B. C. E. Ry., $50,000. The work will be carried out by the City Council, under plans to be prepared by the Provincial engineering staff.

The B.C. Minister of Railways has authorized the opening for freight traffic only of the recently completed line from Port Moody through Coquitlam municipality, to mileage 7. (Feb., pg. 87.)

Cape Breton Electric Co.—We are officially advised that no decision has been reached with reference to the extension of the line to New Waterford, N.S., the construction of which has been under consideration for the past two years. (April, pg. 184.)

Dominion Power and Transmission Co.—We are officially advised that the contract with the Canadian Westinghouse Co., for equipment for the new steam power plant at Hamilton, covers the following:—Two 10,000 k.w, 6,600 volt, three phase, 66 2-3 cycle steam turbine generators operating at 200 lbs. steam pressure, 200 degrees superheat, with surface condensers, condensation pumps and boiler feed pumps. All pumps will be centrifugal type, turbine driven. The exciters will be one turbine driven and two motor driven. The step-up transformers will rise from 6,600 volts to 40,000 volts. There will be the usual switchboards, lightning arresters and other accessories. (April, pg. 184.)

Dunnville, Wellandport and Beamsville Electric Ry.—The Ontario Legislature has granted an extension of time for the building of the several lines authorized. (Feb., pg. 87.)

Edmonton Interurban Ry.—A press report states that the company is considering plans for the building of a branch line to Fort Saskatchewan, Alta. (Mar., pg. 135.) Felix Santallier, Edmonton, is General Manager.

Forest Hill Electric Ry.—The Ontario Legislature has extended the time for construction of this projected line north of Toronto, and increased its bonding powers from $30,000 to $50,000 a mile. Pending financial arrangements for construction, we are informed that nothing has been arranged as to when the building of the line will be started or when the organization of the company will be completed. (Mar., pg. 135.)

Fort William Electric Ry.—G. H. Adair, Fort William, Ont., is authority for the statement that property owners on Arthur St., between Franklin St. and the western city limits, are working on a scheme for an extension of the street railway between the last two mentioned points. It is proposed to build the line by private subscription and turn it over to the city free of encumbrance, for operation. It is stated that the extension will be completed and ready for operation by Nov. 15.

Grand Falls to Limestone, N.B.—The New Brunswick Legislature has incorporated a company with this title, to build an electric railway from Grand Falls, on the St. John River, to Limestone, on the boundary between New Brunswick and Maine. Power was asked to build wharves and docks on the St. John River, but the Legislature refused this.

Grand Valley Ry.—The Ontario Legislature has passed an act to enable the Brantford City Council to acquire the franchise of the G. V. Ry. in Brantford and in the counties of Brant and Waterloo; to pass bylaws for the issue of debentures for securing money necessary for the purchase, improvement and operation of the line; to dispose of any portion of the lines to be acquired as may be advisable; and to appoint a commission of not less than three nor more than five to manage the line.

It is not expected that the line will become vested in the City Council until July 1. Until the city gets possession, the council proposes to give every consideration to the best means of improving the lines and in preparing for their effective operation. (Feb., 1913, pg. 90.)

Guelph Radial Ry.—An extension of time has been granted by the Ontario Legislature for the building of extensions authorized in 1908. Power is also given, subject to the approval of the Ontario Railway and Municipal Board, to build half-mile branches of existing lines.

Press reports state that bids are being asked for alterations at the power house. A. H. Foster, Guelph, Ont., is Manager. (April, pg. 134.)

Hamilton St. Ry.—The street railway committee of the Hamilton City Council has been asking the company to lay new rails on a considerable portion of the lines in the city, to build a second track on a section of Sanford Ave., and to build a stub line from the Wentworth St. incline to the International Harvester Co.'s plant. At a meeting of the committee, Mar. 31, General Manager Coleman intimated that owing to present financial conditions and the amount of work still uncompleted on the Kenilworth Ave. extension, there was little likelihood of the company undertaking any other improvements or extension this year. (Jan., pg. 38.)

Hull Electric Ry.—We are officially advised that at present the company is not arranging for any extensions. A press report stated that the company was going to build some second track, and a branch to Notre Dame Cemetery, Hull, Que. (April, pg. 184.)

Kingston, Portsmouth and Cataraqui Electric Ry.—H. W. Richardson, President, asked the Kingston, Ont., City Council, April 6, when it would be ready to go on with the paving of Princess and King Streets, as the company is ready to lay down a second track from the Y.M.C.A. building to beyond Alfred St. (April, pg. 184.)

Lacombe and Blindman Valley Ry.—We are officially advised that six miles of grading from Lacombe to near Gull Lake, Alta., was completed last autumn, and that a contract has been let for the construction of the entire line to Rimby, about 20 miles from Gull Lake. Press reports state that the contract has been let to S. S. Hogan. It is expected that part of the line will be put in operation by July 31, and the remainder completed by Dec. 31. An order has been placed for one passenger car, which will generate its own power, and for one locomotive to handle the freight traffic.

The officers and directors are:—President, J. C. Gibson; Vice President, A. B. Taylor; Treasurer, E. K. Strathy, Winnipeg; other directors:—S. J. Hungerford, Winnipeg; Hon. S. Barker, M.P.; A. J. Taylor, Hamilton; G. S. May, F. C. T. O'Hara, Ottawa; F. Vickerson, J. Dawson, A. Hume, Lacombe, Alta.; J. R. L. Starr. Engineers, Lacombe, and Inkster, Edmonton, Alta. Except where otherwise stated the offiers and directors reside in Toronto. (Mar., pg. 135.)

Lethbridge Municipal Ry.—The revised capital expenditures approved by the Lethbridge, Alta., City Council, provide for $21,610, of which $3,210 is for improvements at the car barn, and for the provision of a Y and siding at the pavilion in Henderson Park. (April, pg. 184.)

We are officially advised that the proposed extension to Hardieville will be 1.5 miles long and is estimated to cost $17,000. The track will be laid with 60 lb. rails, A.S.C.E. section. Standard overhead construction for 600 volts, d.c., will be used. The construction of the extension is not likely to be undertaken this year unless the money market gets a little easier. A. Reid, Lethbridge, Alta., is Commissioner of Public Utilities.

Montreal and Southern Counties Ry.—We are officially advised that tenders are under consideration for grading and tracklaying on the extension from St. Cesaire to Granby, Que., 15 miles. W. B. Powell, Montreal, is General Manager.

The Board of Railway Commissioners has authorized the opening for traffic of the extension of the lines from Marieville to St. Cesaire, Que., 9 miles, with authority to use the stations, yards and other facilities of the Central Vermont Ry. between these points.

Moncton Tramways, Electricity and Gas Co.—A recent press report states that the company is preparing to make several changes in the location of its lines, among them being the abandonment of the use of the section of the Moncton and Buctouche Ry., in place of which an independent line will be built, and the abandonment of a portion of the High St. line. We are officially advised that the plans are not yet perfected. It is probable, however, that some extensions will be made. An order has been placed with the Canadian General Electric Co. for some new power plant equipment, and orders are being placed for the addition of about 600 h.p. to the boiler equipment. These are to be installed in addition to the plant already in operation, and to take the place of others which are to be discarded. It is also intended to add about 50 lights, either illuminous arcs, or the new nitrogen lamps, to the street lighting system on Main St. (Mar., pg. 135.)

Moose Jaw Electric Ry.—The Moose Jaw, Sask., City Council has been informed by A. H. Dion, General Superintendent, that he has been authorized by the directors to proceed with the extension on Hall St. for half a mile from Main St. The Council passed a resolution calling upon the company to extend the line on Hall St. to 18th Ave., and along that avenue so as to connect with the line now in operation on Athabasca St. East. (April, pg. 184.)

Morrisburg and Ottawa Electric Ry.—The Ontario Legislature has extended the time within which this projected line from Morrisburg to Ottawa, Ont., may be built, and has increased the bonding powers from $20,000 to $30,000 a mile. (Mar., pg. 135.)

Niagara Frontier Electric Ry.—The On-

tario Legislature has granted an extension of time for the building of this projected electric railway. G. H. Pettit, Welland, Ont., is the solicitor. (July, 1911, pg. 683.)

Nova Scotia Tramways and Power Co.—Considerable controversy is taking place in the Nova Scotia Legislature with respect to the application for the incorporation of a company with this title. The applicants ask for authority to issue capital up to $6,000,000, which may be increased to $10,000,000, and to have authority to take over the Halifax Electric Tramway Co., with all its franchises, at $170 for each share of the stock outstanding; to take over all rights of the Nova Scotia Light and Power Co. in certain water powers in King's and Halifax counties recently acquired by Hon. N. Curry and E. N. Rhodes, and to develop and distribute electric power throughout the province, etc. The provisional directors include E. A. Robert, J. W. McConnell, F. H. Wilson, F. J. McIntosh, all of whom are directors of the Halifax Electric Tramway Co. The application is being opposed by the Halifax City Council, and by some power companies. The City Council desires to have all reference to the Halifax Tramway Co. struck out, and the Halifax Board of Trade passed a resolution, April 7, in which the bill is characterized as being much more inimical to the city's interests than the one which was defeated in 1913.

North Midland Ry.—An extension of time for the buiiding of the line from London to St. Marys and Stratford, Ont., and another from London to Clinton, Mitchell and various points between, authorized by the statutes of 1904, has been granted by the Ontario Legislature. The company was originally promoted by interests connected with the old South Western Traction Co. T. M. Little, London, Ont., is solicitor. (Feb., pg. 88.)

Ontario West Shore Ry.—An act has been passed by the Ontario Legislature vesting in T. Strothers, Dungannon, Ont., in trust for the municipalities which guaranteed the company's bonds, the franchises, rights and privileges of the company. The municipalities are already in possession of the line, which was partially constructed. An extension of time is also granted for the building of the line, which was to extend from Goderich to Kincardine, and other points on the shore of Lake Huron. (April, pg. 184.)

Oshawa Ry.—An arrangement has been made under which the company will do the terminal work at Oshawa for the C.P.R., on the same terms and conditions as it has been doing the terminal work of the Canadian Northern Ry. since it opened its line into Oshawa, and as it has been doing the terminal work for the G.T.R. for years. The company is under G.T.R. control.

Ottawa, Rideau Lakes and Kingston Ry.—An extension of time has been granted by the Ontario Legislature for the building of this projected railway between Ottawa and Kingston, Ont. The company is also authorized to build a branch line from near Lombardy, on the projected main line to Perth, and to increase its bonding power from $30,000 to $40,000 a mile. (Feb., pg. 88.)

Owen Sound, Ont.—Toronto and Montreal interests are negotiating with the Owen Sound, Ont., Town Council for a franchise for an electric railway. A 25 year franchise is asked for, the applicants proposing to build eight miles of lines in the town, and a 20 mile line to Meaford, on which steam locomotives would also be used. A guarantee of bonds is being asked. Owen Sound papers stated, April 14, that Sir William Van Horne and Sir Thomas Tait were interested in the project.

Peterborough Radial Ry.—We are officially advised that it is proposed to spend about $40,000 on the line during this year. The bulk of this will be expended upon one mile of track in the central portion of the city, which will be entirely renewed, owing to the City Council laying pavements on the streets on which the line runs. The work will consist of laying 80-335 Lorain sections, and 80 lb. A.S.C.E. section rails, with brick pavement between rails and four bricks wide on the outside. A siding will be laid to the C.P.R. station, on which it is proposed to operate a car which will meet inbound C.P.R. trains and afford passengers direct street car service to all parts of the city. It is also proposed to reduce the headway between cars from 15 minutes to 12 minutes, and later on to 10 minutes, by the addition of extra rolling stock on certain lines. The new track and other improvements will necessitate the purchase of about $8,000 worth of Y's, turnouts, steam road crossings and switches. All new work will be arranged to take both M.C.B. and street railway flanges, and new curves are being run to provide for the passage of freight cars around them. The company has in view the carrying on of a freight interswitching and transfer business between the steam railways and the industrial sites which they do not reach. (Feb., pg. 88.)

Regina Municila Ry.—The commissioners operating the railway received tenders to Apr. 27, in four sections, for street railway material, as follows,—(a) 100 tons 7 in. T steel rails, Loraine section 80.335, 1,000 track bolts and nuts ¾ by 3¾ ins., 1,200 copper rail bonds 10⅛ ins., 60 ditto 42 ins., 60 ditto 62 ins.; (b) 9,000 barrels Canada portland cement; (c) 3 miles 500,000 c.m., t.b.w.p. 19 stranded feeder wire, 2 miles 4.0 t.b.w.p. 19 stranded feeder wire, 10,000 ft. 2.0 hard drawn round trolley wire ; (d) trolley frogs, crossovers, line ears, insulators, hangers and pole line hardware.

St. Catharines, Merritton and Thorold Electric Ry.—At a special meeting of the Thorold, Ont., Town Council, April 12, a bylaw was passed granting the company right of way for an extension from the head of Main St. into the factory district.

St. John Ry.—We are officially advised that the extensions to which reference was made in the report presented at the recent annual meeting are from Kanes Corner to Old Loch Lomond Road, three miles, and from One Mile House to Coldbrook, two miles.

Tenders are under consideration for the erection of car sheds on Wentworth St. H. C. Mott, St. John, is architect. (Feb., pg. 88.)

The Sandwich, Windsor and Amherstburg Electric Ry. owns a lighting plant in Windsor, Ont., for which the City Council has made an offer of $155,000. This was refused, and the Council, April 3, decided to proceed to expropriate the plant, with the object of eliminating competition with the hydro electric system. The Council, the same day, decided to call upon the company to equip all its cars with air brakes, to provide snow cleaning equipment, and to carry out other improvements.

Some time ago the City Council approved of the building of a spur line on Ferry St., and on April 6 the company started work on it. Some members of the council desired to have the permission withdrawn, and wished to have the police stop work, but the transportation committee met and decided that work could go on subject to the supervision of the City Engineer.

The Sandwich Municipal Council informed the company, April 6, that it was about to proceed with the paving of Bedford St., and that if the company was ready to proceed with the laying of a second track there, the two works could be carried out together. (Aprii, pg. 184.)

At a meeting of the Windsor City Council, April 14, the Council reaffirmed the resolution passed Feb. 2, granting the company permission to build a line along Ferry, Chatham and Victoria streets to connect with the existing line on London and Sandwich streets and directed that the necessary bylaw be prepared.

Sarnia St. Ry.—Press reports state that application is being made to the Sarnia, Ont., Town Council for permission to extend the lines in the town. G. E. Wadland, Sarnia, is Manager and Purchasing Agent. (April, pg. 134.)

Saskatoon Municipal Ry.—About 300 ft. of snow fencing has been erected along the line between Saskatoon and Sutherland, Sask., where experience has shown that such protection is necessary.

The ratepayers of Saskatoon are being asked to vote on a bylaw to expend $25,000 upon extensions to the railway. (Mar., pg. 136.)

Sudbury-Copper Cliff Suburban Electric Ry.—The Ontario Legislature has confirmed a bylaw granting a franchise for the building of lines in Sudbury, Ont. The principal terms of the agreement were referred to on pg. 593 of our issue for Dec., 1913. The act also grants the company an extension of time for the building of the various lines authorized to be built in the vicinity of Sudbury and Copper Cliff. (Mar., pg. 136.)

Toronto, Barrie and Orillia Ry.—An extension of time for the buiiding of this line from Toronto to Barrie and Orillia, Ont., has been granted by the Ontario Legislature. The first piece of line which it is proposed to build is from Barrie to a junction with the C.P.R. Toronto-Sudbury line, in connection with which is a franchise for an electric railway in Barrie. The act passed this session gives the company power to build the line from Barrie to Utopia, on the C.P.R. We are advised that it is expected to start construction on this piece of line as soon as the organization arrangements of the company are completed. (Mar., pg. 136.)

Toronto Ry.—The Railway Committee of the Ontario Legislature, by a vote of 10 to 9, approved recently of the clause in the Toronto City Council's bill providing for the operation of the T. R. cars through to Munro Park. This was formerly the terminal, but when the Scarboro Beach park was developed the company made that its terminus. A stub line service was subsequently put on by arrangement with the city. The Legislature Railway Committee directs that the terms of payment and service given for such portion of the line be left to the Ontario Railway and Municipal Board. (Feb., pg. 88.)

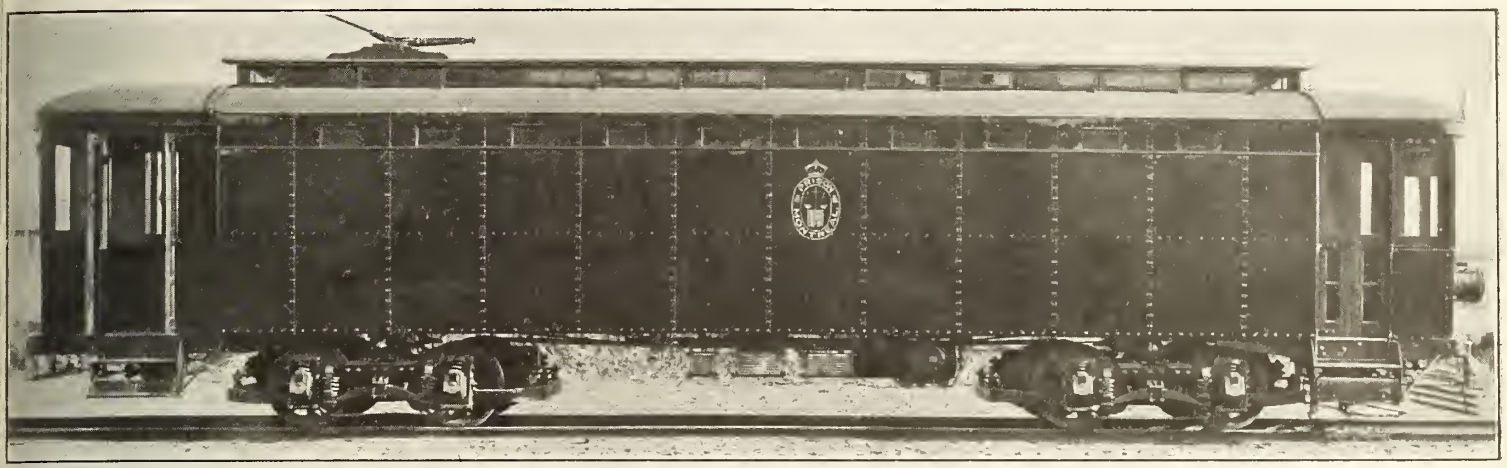
Transcona, Man.—We have been advised that while the Town Council of Transcona has power under an act passed last session of the Manitoba Legislature, to build and operate an electric railway in that town, no plans have been prepared and no arrangements have been made for building such a line, or for connecting it when built with the Winnipeg Electric Ry. (April, pg. 185.)

Winnipeg Electric Ry.—It was reported at the meeting of the Stonewall Municipal Council, April 3, that it will be midsummer at the earliest before the extension into Stonewall is completed. (April, pg. 185.)

A. Reid, Commissioner of Public Utilities, Lethbridge, Alta., in remitting his renewal subscription to Canadian Railway and Marine World writes:—"It is worth $2 to me."

Prison Car for Montreal Tramways Company.

On the building of the new Bordeaux prison, about 7 miles north from the Montreal court house, the problem of transferring the prisoners between the court house and prison was presented, as the distance between the two places is considerably greater than usually exists between these related institutions. As the Sault au Recollet line of the Montreal Tramways Co. passes within a short distance of the new prison, arrangements were made by the provincial authorities for the company to build a special car for this service, which is illustrated herewith.



Prison Car, Montreal Tramways Co., for Operation Between Montreal and Bordeaux Prison.

The car is remodelled from an old interurban car, practically the whole of the frame of the original car being retained, the sheathing and interior arrangement being altered to suit the special service for which it is intended. It is 48 ft. 4 ins. over all, with a length between bulkheads of 34 ft. 8 ins. The underframing consists of 7 in. side sills, extending the length of the body. The side framing has received the principal alteration, the sheathing consisting of no. 16 sheet steel, carried clear up to the roof decking, and attached to 2 by 3 in. vertical posts. The sheathing is riveted together, and thus forms a full side sheet, forming a deep side girder, relieving the wooden side sills. Just below the deck, there are 13 by 4½ in. windows, 10 per side, placed above the line of vision for obvious reasons. Ventilation is obtained in the usual manner from the monitor roof, agumented by forced daught from a heater in the front of the car.

The interior seating arrangement resembles the usual cross seat car layout, with the difference that the body is divided into two main sections by a midway partition, the object being to separate the convicted prisoner from those about to be tried, as required by law. At the end of each section, there is a guard's seat, raised on a 6 in. platform, to enable a better view of the interior being obtained. On the rear platform there is a small compartment on the inner side of the car, reserved for the use of the governor of the prison. All the doors are locked and barred. The car is equipped with four Westinghouse 533-T-4 motors, with a K-35-G controller.

The prisoners are now being transported to the point nearest the prison on the cars, and transferring there to prison vans for the balance of the trip. A spur will be built from the main line, running directly into the prison yard, and will also be used for transporting fuel and other supplies to the prison. Montreal is said to be the first city in America to employ this means of transporting prisoners, but a car is used for this purpose in Berlin, Germany. It is cheaper than patrol waggon transportation, and has the added advantage of saving the prisoners from a great deal of needless humiliation. The car has a seating capacity for 54, and makes the trip between the two points twice a day.

Interior of Prison Car, Looking Forward.

Interior of Prison Car, Looking Towards the Rear.

Winnipeg River Power Co.—A press report, April 13, stated that work was started the previous day on a railway line of 12 miles from Lac du Bonnett to the site of the new power plant at the Grand Bonnet Falls of the Winnipeg River. It is reported that J. G. White & Co., the Engineers, have under consideration three alternative plans for building the dam and plant, and that it is expected tenders will be asked for the entire work early in the summer.

The Chatham, Wallaceburg and Lake Erie Ry's power house at Chatham, Ont., was wrecked by an explosion of gas recently.

Electric Railway Finance, Meetings, Etc.

Brantford St. Ry.-Grand Valley Ry.—The appeals in the actions of the city of Brantford against the company have been enlarged to May 4.

British Columbia Electric Ry. and Allied Companies.—Gross earnings for Feb., $704,002; operating expenses, maintenance, etc., $513,748; net income, $190,255, against $688,333 gross earnings; $512,816 operating expenses, maintenance, etc.; $175,517 net income, for Feb., 1913. Aggregate gross earnings for eight months ended Feb. 28, $6,034,831; net income, $1,627,616, against $5,682,428 aggregate gross earnings; $1,626,838 net income for same period, 1912-13.

Cape Breton Electric Co.—Gross earnings for Feb., $25,284.98; operating expenses and taxes, $15,697.72; net earnings, $9,587.26; interest charges, $5,211.36; balance, $4,375.90; bond sinking and improvement funds, $1,190; balance for reserves, depreciation, etc., $3,185.90; against $26,141.44 gross earnings; $17,005.50 operating expenses, taxes, etc.; $9,135.94 net earnings; $4,881.26 interest charges; $4,254.68 balance; $1,190 bond sinking and improvement funds; $3,064.68 balance for reserves, depreciation, etc., for Feb. 1913. Aggregate gross earnings for two months ended Feb. 28, $55,083.27; net earnings, $20,822.37; interest charges, bond sinking and improvement funds, $12,838.73; net balance, $7,983.64, against $57,976.87 aggregate gross earnings; $23,210.88 net earnings; $11,894.45, interest charges, bond sinking and improvement funds; $11,316.43 net balance, for same period 1913.

Lethbridge Municipal Ry.—The financial statement for the year ended Dec. 31 shows total receipts of $60,609.82, and total operating expenditures (including $4,883.96 for management expenses) of $64,757.37, leaving a deficit on the year's operations of $4,157.75. The debenture interest and sinking fund for the year amounted to $26,683.47, making a total cost to the citizens for the electric railway of $30,831.22.

The general balance sheet shows total liabilities of $452,806.21, against which there are the following assets:—cost of line, car barns, rolling stock, etc., $352,275.59; stock on hand, $3,962.87; cash and accounts receivable, $8,957.83; sinking fund, $7,281.12; unexpended debenture funds, $17,224.41. The discount on debentures and the loss in operating since the line was opened amount to $75,384.51.

Mount McKay and Kakabeka Falls Ry.—In addition to its railway the company has certain power rights on the Kakabeka River, and the Fort William, Ont., City Council has expressed the opinion that if it was made certain that these could be acquired and developed the purchase of the company's line and property would be a good thing for the city. Without the power rights the line would be of no special advantage. The Council has the matter still under consideration.

Pictou County Electric Co.—An issue of first mortgage 50 year sinking fund gold bonds, dated May 6, 1913, and due May 6, 1943, being balance of the original issue, is being offered in Montreal, at a price to yield just over 6%. The company was originally incorporated in 1902 as the Egerton Tramway Co., and in 1909 purchased the New Glasgow Electric Co. It now operates about 10 miles of tramway in, and connecting, Trenton, New Glasgow, Stellarton and Westville, N. S. The railway earnings for 1913 were $77,833, passengers carried, 1,637,351. The officers and directors are, President, C. A. Flaherty, Boston, Mass.; Vice President, M. L. Flaherty, New Glasgow, N. S.; other directors, E. M. McDonald, M. P., Pictou, N. S.; A. Perry-Martin, Newtown, Mass.; Gardner Perry and W. B. Rogers, Boston, Mass.

Saskatoon Municipal Ry.—Receipts for Feb., $9,466.27, against $14,943.82 for Jan. Passengers carried, 268,811; mileage of cars, 40,530. Total operating expenses, including interest on capital, etc., $14,028,27. The decrease in receipts is due to the breakdown of the generators, Feb. 18 and 19, and the consequent tying up of the service for several days.

Saskatoon Municipal Ry.—In the statement of assets and liabilities for the City of Saskatoon, Sask., for 1913, the assets include the street railway, valued at $691,166.73.

St. John Ry.—Following are the officers and directors for the current year:—President, H. H. McLean, M.P., St. John, N.B.: Vice President, F. R. Taylor, St. John; other directors:—R. B. Emerson, J. Manchester, W. H. Thorne, St. John; J. K. L. Ross, Montreal.

St. Thomas Street Ry.—The St. Thomas, Ont., City Council has provided $8,000 in the estimates to cover the estimated deficit on the operation of the street railway during the current financial year. This is $2,000 less than in 1913.

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R. H. Sperling,
General Manager British Columbia Electric Railway.

The Mayor recently informed the City Council that an offer had been made him for the leasing of the line. It was decided to invite a definite offer in writing. Reports state that the offer was made in the interests of the London and Lake Erie Ry. and Transportation Co. Up to the time of writing no offer had been received by the committee in charge of the street railway.

Toronto and Mimico Ry.—The Toronto City Council has not decided on any definite policy with reference to the taking over of the Sunnyside-Humber section of this line, now part of the Toronto and York Radial Ry's Lake Shore Division.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for Feb., $777,683; operating expenses, maintenance, etc., $400,357; net earnings, $377,326, against $718,313 gross earnings; $377,483 operating expenses, maintenance, etc.; $340,830 net earnings for Feb., 1913. Aggregate gross earnings for two months ended Feb. 28, $1,625,628; net earnings, $784,934, against $1,495,241 aggregate gross earnings; $716,603 net earnings for same period, 1913.

Winnipeg Electric Ry.—Gross earnings for Feb., $350,977; operating expenses, $213,104; net earnings, $137,873, against $320,431 gross earnings; $177,897 operating expenses; $142,534 net earnings for Feb., 1913. Aggregate gross earnings for two months ended Feb 28, $733,648; net earnings, $294,366, against $671,928 aggregate gross earnings; $294,50 net earnings for same period, 1913.

Personal Paragraphs.

W. T. WOODROOFFE, who recently resigned from the position of Superintendent of the Edmonton, Alta., Radial Ry., has removed to Vancouver, B.C.

F. CONWAY, Chief Engineer, British Columbia Electric Co., gave an address to the company's employes, who are members of the social club, at Vancouver, April 2 on the development of the company's undertaking during the past ten years.

R. P. LEWIS has been appointed Traffic Inspector by the Winnipeg City Council, in connection with the recent report on the street railway situation and the rerouting of cars, as made to the Manitoba Public Utility Commission, by R. M. Feustel. The new regulations went into effect Apr. 16.

DUNCAN McDONALD, formerly General Manager, Montreal Tramways Co., and a former President of the Canadian Street Railway Association, has been elected as one of the city controllers of Montreal. The term of office is four years and the yearly salary $7,500.

W. G. MURRIN, heretofore Mechanical Superintendent, British Columbia Electric Ry., has been appointed General Superintendent, and in addition to the Mechanical Department, hitherto under his control, he has charge of the City and Suburban Transportation Departments. Office, Vancouver B. C.

T. R. CUMMINS, Engineer, Niagara, Welland and Lake Erie Ry., Welland, Ont., has resigned on account of the unlikelihood of there being any construction work on the line this year. He expects to take charge of the surveys of a large timber property in British Columbia, with headquarters at Revelstoke.

A London, Eng., cablegram at the end of March stated that R. H. SPERLING, General Manager, British Columbia Electric Ry., had been offered a seat on the company's board with the position of Assistant to the Chairman, R. M. Horne-Payne, in London. Mr. Sperling has gone to London in this connection and during his absence the Comptroller, GEORGE KIDD, will be acting General Manager.

ROCHFORT HENRY SPERLING, General Manager, British Columbia Electric Ry. Vancouver, B.C., whose portrait appears in this issue, was born in London, England Feb. 9, 1876, and entered transportation service Feb., 1896. His service with the B.C. Electric Ry. dates from 1898, since when, to 1900, he was Superintendent, Victoria Branch, Victoria; 1900 to 1901 General Superintendent and Assistant Engineer, Victoria; 1901 to 1905, General Superintendent and Chief Engineer, Vancouver. In 1905 he was appointed General Manager, which position he still holds.

The Interurban Co., which recently applied to the Dominion Parliament for authority to change its name to that of the Interurban Telephone Co., is applying for a further change to that of the Rio de Janeiro and Sao Paulo Telephone Co. This is the company which the Toronto City Council thought might have been used for the building of electric railways in Toronto.

Electric Railway Notes.

The Montreal Tramways Co. has received 10 steel underframe city cars, from Canadian Car and Foundry Co.

The Winnipeg Electric Ry. is arranging so that in future all its cars shall stop on the near side of crossings.

The Moncton Tramways, Electricity and Gas Co. will, it is reported, be in the market during the year, for several single truck cars.

The Montreal and Southern Counties Ry. has filed its standard freight tariff to be applied between all stations on its line. It went into effect Apr. 13.

The Sandwich, Windsor and Amherstburg Ry. Co. has declined the offer of the civic light committee of the Windsor, Ont., City Council, of $155,000 for its lighting plant.

The Manitoba Public Utility Commission is considering the matter of ordering the Winnipeg Electric Ry. to adopt the p-a-y-e system on all future cars put into service.

The car barns of the Toronto and York Radial Ry.'s Mimico Division were badly damaged by fire, Mar. 30. Two cars, valued at $12,000, were destroyed, and the damage to the building is estimated at $3,000.

The Edmonton Radial Ry. has received two single ended, double truck city cars, mounted on standard trucks, with Westinghouse 101 B2 quadruple equipment, from Preston Car and Coach Co.

The Regina Municipal Ry. has received tenders for four double truck cars, similar to the 16 supplied during last year by Preston Car and Coach Co., except that they will be 6½ ft. longer, with seating accommodation for six additional passengers.

The Lethbridge, Alta., City Council, in view of the continued loss on the operation of the electric railway in the city, is considering the advisability of reducing the staff, so that one man will act both as motorman and conductor. This system has recently been put in operation on the Brandon Municipal Ry.

The British Columbia Electric Ry. has received ten double ended, double truck city cars, mounted on 27 G1 trucks with Westinghouse 101 B2 quadruple equipment, for its Victoria service; and five single ended, double truck city cars, for its Vancouver service, from Preston Car and Coach Co.

The appeal of the Montreal Tramways Co., from the decision of the Quebec Public Utilities Commission ordering the company to give details of its workings, on the ground that the commission had no jurisdiction, has been dismissed by the Court of the King's Bench, Montreal, the court holding that the commission has ample powers.

Sir Hugh Graham, who owns the Star and controls other newspaper properties in Montreal, recently denied that he owned 10,000 shares of Montreal Tramways Co.'s stock, as was reported. He stated that he did not own one share in the company, nor had he any option, promise, or expectation of any shares, and offered $1,000,000 if his statement is found to be incorrect.

The officers and operating officials of the Montreal Tramways Co. have started a safety first campaign among its employes, and for the benefit of the general public. Personal letters have been addressed to motormen and conductors, and placards have been posted throughout the city calling public attention to definite points in reference to which the people can aid the company's employes in preventing accidents.

The Peterborough Radial Ry. has ordered from the Ottawa Car Mfg. Co., one single truck, semiconvertible, p-a-y-e car, equipped with 21-E truck, 8ft. wheel base, life guards, arc headlight, scrapers, rattan covered seats, curtains and polished bronze trimmings. The interior will be finished in quarter cut oak, and the complete motor equipment will be supplied by Canadian General Electric Co.

M. O. Robinson, General Manager of the Port Arthur Electric Ry. and of the Fort William Electric Ry., has issued a notice with respect to the operation of a baggage car. No parcels will be carried on passenger cars, and parcels and freight will only be accepted fo rcarriage in the baggage car and on the Port Arthur-Fort William line. No c.o.d. parcels will be accepted. Shippers may use a freight receipt, books of which may be bought for $1, otherwise they must pay cash to the baggageman on shipping their freight. The rates are 5c., 10c. and 25c. Claims for lost goods must be made within 24 hours. The baggage car will make six trips a day each way.

The Guelph Radial Ry. has received two double ended, p-a-y-e city cars, mounted on standard trucks with rolled steel wheels, Westinghouse 101 B2 quadruple equipment and S. M. 1 air brakes, and with all steel underframes, and semisteel sides and ends, from Preston Car and Coach Co. The interior arrangement is a slight departure from that hitherto adopted by the G. R. R., in that they have no bulkheads. The exit and entrance doors are under the conductor's control, and the front door exit under the motorman's control. By a careful arrangement of the steel members in the body, weight is eliminated to a great extent, and a more commodious car with great carrying capacity is provided, with minimum weight.

Second Track Mileage and Freight Carried on Electric Railways.

Of the 26 operating electric railways in Canada, 20 operate 371.14 miles of second track, and 23 carry freight on their lines. The mileage of second track operated, and the tons of freight carried for the year ended June 30, 1913, are given in the following table:

	Length of Second Main Track.	Number of Tons of Freight Carried.
	Miles.	Tons.
Berlin and Waterloo S. R.	1.48	.....
Brantford and Hamilton Ry.	.....	8,503
British Columbia E. R.	118.56	448,750
Calgary Municipal Ry.	12.00	.....
Chatham, Wallaceburg and Lake Erie Ry.	.....	125,553
Cornwall S. R.	.....	81,640
Edmonton Radial Ry.	.....	42,780
Galt, Preston and Hespeler E. R..	1.36	202,547
Grand Valley Ry.	1.95	292
Guelph Radial Ry.	.....	12,680
Halifax Electric Tramway	8.70	.....
Hamilton, Grimsby and Beamsville E. R.	.....	44,854
Hamilton Radial Ry.	8.69	14,923
Hull E. R.	10.60	7,327
Levis County Ry.	.....	4,190
London St. Ry.	6.79	.....
Montreal Park and Island Ry. ..	16.03	111,005
Montreal S. R.	60.10	100,000
Montreal Terminal Ry.	4.28	91,302
Moose Jaw E. R.	1.50	.....
Niagara Falls Park and River Ry.	11.20	.....
Niagara, St. Catharines and Toronto Ry.	.....	356,150
Oshawa Ry.	.....	169,278
Ottawa E. R.	21.42	.....
Port Arthur and Fort William E. R.	.....	18,565
Quebec Ry., L. & P. Co., Citadel Division	.....	3,600
Quebec Ry., L. & P. Co., Montmorency Division	9.80	.....
Regina Municipal Ry.	7.33	.....
Sandwich, Windsor & Amherstburg Ry.	.....	2,500
Sarnia S. R.	.....	8,610
St. John Ry.	6.50	.....
Toronto Ry.	61.72	.....
Toronto and York Radial Ry. ..	.....	67,558
Windsor, Essex & Lake Shore Rapid Ry.	1.13	35,323
Total	371.14	1,957,930

Halifax Electric Tramway Company's Annual Report.

Following are extracts from the report of the calendar year 1913 presented at the annual meeting in Halifax, N.S., recently.

During the year the operations were carried on with satisfactory results. The policy of the company being to develop and improve its various services, a large amount of construction work was performed, including the double tracking of Campbell Road, Inglis and Hollis Streets, and the extension of the track on Quinpool Road from Oxford St. to the Arm Bridge. Six modern closed cars were added to the rolling stock, additions made to car equipment, the electric light system was extended and a new luminous arc system installed on Barrington and Granville Streets. In addition to the capital expenditure above referred to, and apart from repairs chargeable to operating account, a comparatively large amount was expended in renewals and betterments. The foregoing expenditure has resulted in greatly improving the tramway and electric light services and the physical condition of the property has been well maintained.

The company has continued its liberal policy toward its employes in respect to wages. In May last substantial increases were made in the rates and an agreement entered into with the employes for two years.

The directors desire to express their appreciation of the very efficient and valuable services of all the officials in charge of the company's operations.

Profit and Loss Account.

Passenger receipts	$301,771.11
Electric light and power, gross earnings.	232,554.89
Gas department, gross earnings	62,076.75
Miscellaneous earnings	9,531.07
	$605,933.82
Operating expenses	$337,008.99
Interest on mortgage bonds	30,000.00
Renewals and betterments	8,117.98
Provision for bad debts	500.00
Dividends	112,000.00
Balance to surplus account	118,306.85
	$605,933.82

Surplus Account.

Balance Dec. 31, 1912	$704,119.54
From profit and loss account Dec. 31, 1913	118,306.85
	$822,426.39
Extraordinary expenses	$ 24,490.65
Adjustment of liability insurance premiums (3 years)	3,014.10
Balance Dec. 31, 1913	794,921.64
	$822,426.39

The percentage of operating expenses to income was 56.36%; passengers carried, 6,876,003; car mileage, 1,275,527.

The directors for the current year are:—E. A. Robert, Montreal, President; J. W. McConnell, O. E. Smith, Vice Presidents; W. G. Ross, F. H. Wilton, Sir Frederick Borden, H. H. Smith, W. M. P. Webster, J. A. Neville, J. E. Wood, P. J. McIntosh. The Manager is J. W. Crosby.

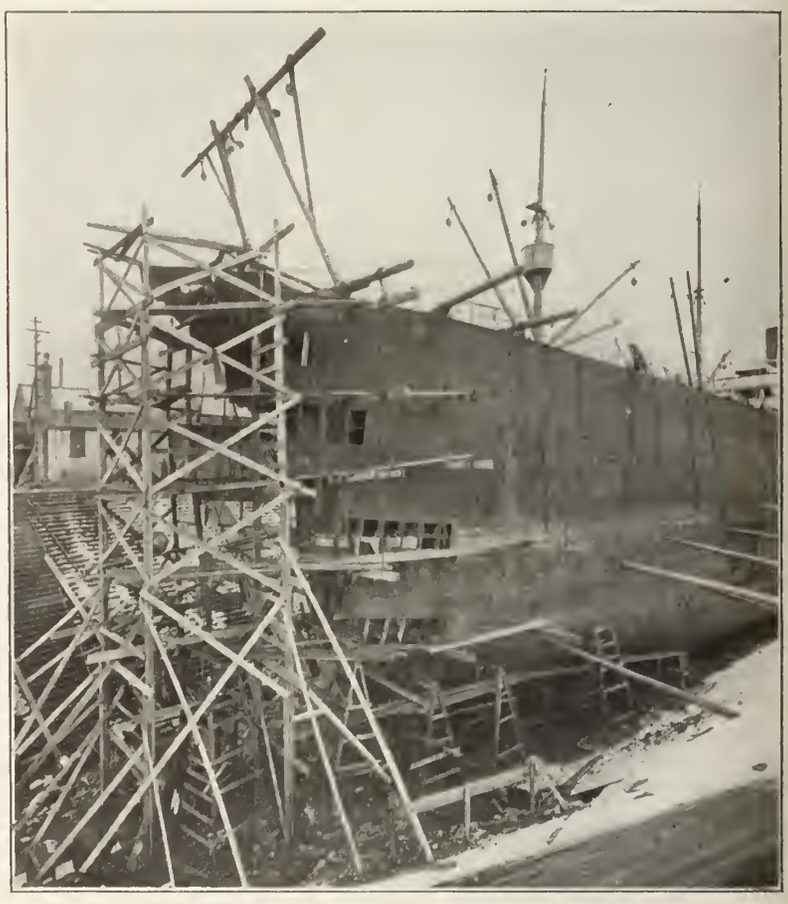
Canadian Au'o Bus Co.'s Franchise.—The appeal from the decision of Justice Demers in the action of D. Robertson, a shareholder of the Montreal Tramways Co., to have the franchise granted to the Canadian Auto Bus Co. by the Montreal City Council, set aside, has been set down for hearing at the May sittings of the Quebec Supreme Court. The decision appealed against held all the proceedings of the Board of Control and of the City Council in regard to the granting of the franchise as having been legal and regular.

The Toronto and York Radial Ry. is in the market for 3 cars for its Mimico Division to replace those which were burned recently.

Marine Department

The Steamship Manchester Commerce Repaired at St. John's, Nfld.

Complete repairs to the Manchester Liners' s.s. Manchester Commerce, which was damaged in a collision with an iceberg in the Belle Isle Straits in Oct., 1913, were carried out in the Reid Newfoundland Co.'s dockyard at St. John's. Reference to the illustrations on this page will show the extent of the damage, and it was feared that the work was of too extensive a nature for other than temporary repairs to be undertaken locally. The repairs covered the removal of about 60 damaged plates and replacing them with new ones, and the placing in position of a complete new stem, in addition to a few minor repairs. The work was carried out under the direct charge of W. E. Ladley, Superintendent of Motive Power, R.N. Co., and was completed in 47 days, or within three days of the time limit, as fixed by the contract. It is stated that this is the largest undertaking of the kind carried out at St. John's, and it is satisfactory to know that such repairs can be handled on this side of the Atlantic, instead of making temporary repairs, until the vessel can be taken to Great Britain, or sending the work to U.S. yards. The amount spent in local labor approximated $30,000



The s.s. Manchester Commerce In Dry Dock at St John's, Newfoundland.

J. L. WELLER, M. Can. Soc. C. E., Engineer in Charge, Welland Ship Canal, addressed the Canadian Society of Engineers, and the graduates of the School of Practical Science, Toronto, Apr. 16, on the work of building the new ship canal.

The Proposed Georgian Bay-Montreal Ship Canal.

As reported in our last issue, a commission has been appointed to enquire into the commercial possibilities of the proposed canal to connect the Georgian Bay with the St. Lawrence River at Montreal. The commission consists of:—W. Sanford Evans, Winnipeg, chairman; F. S. Meighen and E. Gohier, Montreal, with J. D. Hepburn as Secretary. The authorization of the commission covers the following points:—

A study of the transportation problem in relation to the proposed waterway, and to what extent it can help in developing the resources of the country; the advantages of a large waterway from the lakes to the seaboard, open to the largest type of lake carriers, and the feasibility of these carriers navigating such waterway, and the influence on the rate regulation of transport, especially upon cheaper commodities which the country produces; the competition of the waterway with the railways; the effect on railways by creating new industries, on account of cheap transportation of low grade freight that cannot be handled by rail, causing expansion in industries and increase to the population and demand for a higher class of freight seeking transportation by rail;

The probable volume of traffic available on account of the natural advantages of such waterway, which would be the shortest and deepest water route from the head of the lakes to the seaboard for the largest lake vessels, and the probable length of the open navigation season through this waterway; traffic of the Great Lakes and how it reaches the seaboard; the percentage of Canadian traffic handled through U.S. ports, and causes for this diversion;

Lake transportation; rates which obtain; lake and rail rates as against all rail rates, also a comparison with an all water route rate, and a comparison between the proposed Georgian Bay ship canal route, and all the competing routes in existence and in course of construction, and their capacity; comparative cost of transportation per ton mile, rail, lake and rail, and all water;

A comparison of the volume of traffic which may be handled by water as against the rail routes within the same period; and possible economic advantages of such a waterway;

The position of the Northwest, Fort William and Port Arthur being the objective point of all lines running through the wheat belt; how the situation at the head of the lakes would be ameliorated, and whether an all water route from Fort William to the seaboard for largest lake vessels would be the natural complement of the present water and rail routes;

The position of the existing and projected Gulf Lines, via Galveston, what their influence would be regarding diversion of traffic from the lakes and St. Lawrence route; the effect upon the movement of the traffic by the opening of the Hudson Bay, Pacific and Panama routes;

The conditions which exist at the Atlantic seaboard, Canadian and U. S., as to handling traffic, and ocean and insurance rates;

International trade; the facilitating of

trade between the provinces, the Northwest to supply Ontario, Quebec and the Maritime Provinces with wheat at a cheaper transportation rate, Ontario and Quebec to supply, in return, the product of their manufactures, whilst it will perhaps be possible for Nova Scotia to supply coal to some Ontario points, at a cheaper freight rate than it now costs to bring it from the U. S., effecting a great saving to the country; the iron industry and other mineral resources; the deep waterway as a factor in their development; pulp industry and the possibility of development; the tendency to manufacture at the base of supply; the possibilities along the route of the waterway where raw material which cannot be transported by rail at a low rate is available; the easy development of water power at large dams for manufacturing purposes;

New territory opened in the Northwest and the requirements to move the grain crop in the future to open market; the cost of transporting wheat from important centres in the Northwest to the head of the lakes;

Storage at the head of the lakes and the seaboard, and extent of terminals required;

Markets, general statistics, synopsis of history of deep canals and their trade development; and generally speaking, the commercial feasibility of the proposed waterway.

Coast, Lake and River Officers for 1914.

The following appointments, made by the principal navigation companies, engaged in Canadian navigation, for their various steam vessels and tugs, for this year, have beeen reported to Canadian Railway and Marine World, by the managements, in addition to those published in our last issue. The first column gives the names of the vessels, the second, those of the captains, and the third those of the chief engineers:—

American Yukon Navigation Co., Seattle, Wash.

Alaska	J. S. McCann	J. P. R. Morrison
Alice	J. Worth	A. Stevens
Delta	M. Lemley	T. C. Fitzgerald
Klondyke	E. J. Baker	R. C. Jones
Louise	S. E. Lancaster	M. J. Stack
M. L. Washburn	E. J. Josie	F. A. Anderson
Sarah	M. M. Looney	M. Madin
Schwatka	W. F. Hoelscher	H. Murphy
Tanana	J. T. Gray	O. A. Anderson
Yukon	J. Green	J. Pearson

Bowring Bros., Ltd., St. John's, Nf'ld.

Eagle	E. Bishop	A. McKinlay
Florizel	C. Smith	J. Reader
Hawk	G. Stewart	J. Fitzgerald
Portia	J. W. Kean	A. Smith
Prospero	A. Kean	Jas. McKinlay
Ranger	K. Knee	F. Maher
Stephano	Jos. Clark	J. M. Fernandez
Terra Nova	W. Bartlett	A. F. Osmond
Viking	W. Bartlett, Jr.	C.Lewis

British Yukon Navigation Co., Vancouver, B.C.

Canadian	J. T. Douglas	J. P. Bourne
Casca	J. O. Williams	J. R. Gaudin
Dawson	C. H. Bloomquist	J. P. Young
Gleaner	J. G. Roberts	J. Lauderdale
Nasutlin	J. Doddridge	R. C. Hawes
Scotia	J. McDonald	D. Sullivan
Selkirk	G. H. McMaster	W. C. Vey
White Horse	W. H. Turnbull	P. Larssen

Butler Freighting and Towing Co., Victoria, B.C.

Grainer	D. J. Butler	A. Pike

Canada Cement Transport, Ltd., Montreal

John Duncan	B. Palmatier	L. Marchand
Pueblo	F. A. McMann	W. Charbonneau

Canada Steamship Lines, Ltd., Montreal

A. E. McKinistry	A. E. Stinson	A. C. Leitch
Acadian	R. McIntyre	J. Duguid
Bickerdike	D. Charland	S. LaRue
C. A. Jaques	O. Patenaude	F. Hamelin
Cadillac	T. D. Sullivan	A. Hawkins
Calgarian	P. McKay	A. Black
Canadian	W. Anderson	A. McLaren
City of Hamilton	J. L. Baxter	E. Hamelin
City of Ottawa	W. Cox	S. Murray
D. A. Gordon	R. F. Pyette	G. Adams
Donnacona	R. Alexander	F. Wilson
Doric	H. J. Aitken	Jos. Aston
Dundee	Jas. Woolner	E. Shaw
Dunelm	C. R. Albinson	G. E. Wilson
Emperor	G. W. Pearson	G. Smith
Empress of Fort William	Jas. Wilson	G. Biggar
Empress of Midland	D. Burke	E. House
Fordonian	J. E. Mann	W. Gronning
Glenellah	W. W. Allen	W. A. McWilliams
Haddington	R. J. Wilson	C. Leriche
Hamiltonian	A. B. McIntyre	A. E. Kennedy
Kenora	W. Brian	H. McDonald
Martian	J. F. Davis	J. W. McLeod
Midland King	W. Cunningham	Jas. McGregor
Midland Prince	Jas. Tindall	J. A. Pickard
Midland Queen	N. McGlennon	J. Boynton
Neepawah	W. Stalker	C. Carr
Renvoyle	H. Redfern	C. Holmes
Rosedale	W. Jewitt	H. McWilliams
Sarnian	G. Mackey	J. D. Andrews
Stadacona	Jas. Connally	W. W. Norcross
Strathcona	C. Dineen	Jas. Payne
Tagona	J. S. Moore	W. Taylor
W. Grant Morden	N. Campbell	R. Chalmers
Wahcondah	D. F. Cornet	Jos. Kennedy
Winona	B. Garvie	J. Bonner

Canada Steamship Lines, Limited, Montreal. Passenger Vessels.

Aletha	J. E. Rathbun	S. Thurston
Alexandria	Jos. Rinfret	T. J. S. Milne
America	C. J. Hinckley	Jas. Gillie
Belleville	W. Bloomfield	John Kennedy
Berthier	C. Laviolette	T. Matte
Boucherville	A. Laviolette	C. Hamel
Brockville	D. B. Christie	C. McWilliams
Cascapedia	John Hearn	E. Richards
Caspian	J. J. Jarrell	W. Dunigan
Cayuga	C. J. Smith	A. Main
Chicora	T. Allen	N. Griffin
Chippewa	W. Malcolm	H. Parker
Corona	B. A. Bongard	A. J. Woodward
Kingston	E. A. Booth	W. Chipman
Longueuil	H. Mandeville	H. Noel
Macassa	Jas. Henderson	E. A. Prince
Modjeska	P. Walsh	J. Findlay
Montreal	F. X. LaFrance	N. Beaudoin
Murray Bay	W. Gagne	A. Gendron
New Island Wanderer	W. C. Hudson	J. A. Cook
North King	R. H. Carnegie	G. Boyd
Quebec	L. R. Demers	A. Ouzilleau
Ramona	E. M. Charlebois	G. W. Willix
Rapids King	.....	J. Matte
Rapids Prince	G. Batten	G. M. Hazlett
Rapids Queen	J. P. Stephenson	A. Charbonneau
Rochester	Jas. Owens	J. M. Cummings
Saguenay	Jos. Simard	A. Godin
Saronic	.....	.....
Syracuse	N. Heffernan	J. E. Kane
Ste. Irenee	.....	G. Gagnon
St. Lawrence	John Bertrand	B. F. Farrell
Tadousac	Jos. Dugal	M. Latulippe
Thousand Islander	C. H. Kendall	W. M. Willix
Three Rivers	A. Mondor	C. Gendron
Toronto	H. W. LaRush	D. J. Leslie
Turbinia	B. W. Bongard	W. Noonan
Varuna	.....	Jas. Walker

Canadian Lake and Ocean Navigation Co., Toronto

Scottish Hero	R. D. Simpson	H. Harrison
Turret Cape	P. D. McCarthy	J. J. Dove
Turret Court	N. Barret	Rathbone

Canadian Pacific Railway, British Columbia Coast Service, Victoria, B.C.

Charmer	W. L. Gilchrist	J. M. Greenshields
Joan	S. H. Ormiston	C. H. Waller
Nanoose	F. R. Springall	D. Stewart
Princess Adelaide	R. A. Hunter	T. Moffatt
Princess Alice	L. P. Locke	J. Pettigrew
Princess Beatrice	G. J. Hawes	R. Moffatt
Princess Charlotte	T. O. Griffin	J. A. Heritage
Princess Ena	C. Campbell	R. Coulthard
Princess Maquinna	J. McLeod	J. E. Hill
Princess May	P. J. Hickey	W. Oliver
Princess Patricia	J. Ritchie	W. B. Anderson
Princess Royal	D. Brown	J. Thaw
Princess Sophia	G. D. Robertson	A. Alexander
Tees	E. Gillam	B. J. Osbon
William Joliffe	T. S. Guns	J. Purdey

Eastern Manitoulin Royal Mail Steamship Line, Little Current, Ont.

John Haggarty	S. J. Smith	John Needle

Grand Trunk Pacific Coast Steamship Co., Vancouver, B.C.

Henriette	H. L. Roberson	J. Y. H. Taylor
Prince Albert	W. S. Morehouse	J. Quine
Prince George	D. Donald	I. O. Handy
Prince John	C. W. Wearmouth	A. S. Munro
Prince Rupert	D. Mackenzie	D. G. Ferrier

Grand Trunk Railway Detroit River Car Ferries, Windsor, Ont.

Detroit	R. Aikin	H. Lowry
Great Western	M. Bausette	J. Ladds
Huron	A. Baillargeon	A. Cook
Lansdowne	H. Oldenberg	W. Belsom
Transfer	G. Homer	W. Taylor
Transport	W. Norvall	F. Robinson

La Have Steamship Co., West La Have, N.S.

Samson	W. E. Parnell	W. H. Logan
Trusty	J. Drouse	A. Zwicker

The Levis Ferry, Ltd., Levis, Que.

Lauzon	A. Forgues	B. Lapointe
	O. Fortin	A. Langlois
Levis	G. Chamberland	L. Beaudoin
Plessis	N. Thivierge	E. Beaudoin

Merchants Mutual Line, Ltd., Toronto

A. E. Ames	T. S. Patterson	L. McMillan
Beaverton	O. Patterson	H. Myler
H. M. Pellatt	N. McKay	W. Param
J. H. Plummer	W. O. Zealand	A. McCauley
Mapleton	A. G. McKay	E. Spenser
Saskatoon	W. Honsberger	J. H. McHattie

Midland Transportation Co., Limited, Midland, Ont.

C. W. Chamberlain	B. W. Morgan	E. Hurel

The Miramichi Steam Navigation Co., Chatham, N.B.

Alexandra	J. Nowlan	W. Stewart
Miramichi	J. P. Bullick	N. Smith
Sybella, H.	E. Steel	A. McIntyre

Montreal Transportation Co., Montreal

Advance	G. M. Guild	M. J. Sherman
Fairmount	James Reoch	G. Flemming
Glenmount	H. Peters	R. Knight
Kinmount	John Wood	R. Taylor
Prince Rupert	J. W. Sutherland	R. H. Veech
Rosemount	W. Liddell	R. Hepburn
Stormount	P. C. Telfer	F. Moyle
Westmount	F. Howell	W. C. Spencer
Windsor	John Doyle	A. Dunn

National Steamship Co., Ltd., Toronto

Natironco	W. Montgomery	W. A. McLaren

Newcastle Steamboat Co., Newcastle, N.B.

Dorothy N.	C. S. Amos	A. McLean
Rustler	L. McDonald	James Dickens

Northern Transportation Co., Athabasca Landing, Alberta

Northland Call	J. Bird	C. H. Desranleau
Northland Echo	B. Barker	J. A. Paterson
Northland Star	B. Wagenitz	.....
Northland Sun	J. Matheson	W. Beadle

Ogdensburg Coal and Towing Co., Ogdensburg, N.Y.

A. McVittie	G. P. Clifford	F. C. O'Brien
Avon	John Gallagher	D. G. Costello
William L. Proctor	P. J. McGrath	R. Wood

Pembroke Transportation Co., Ltd., Pembroke, Ont.

Oiseau	John Tierney	M. Reid

Peninsula Tug and Towing Co., Wiarton, Ont.

Crawford	W. M. Tyson	C. Hearn
Homer Warren	F. Wood	W. C. Fox
Thos. R. Scott	M. McDonald	W. Lake

Port Huron and Sarnia Ferry Co., Port Huron, Mich.

Grace Dormer	.....	J. Kinirie
Hiawatha	E. M. Thomas	H. Meyers
James Beard	G. Waugh	O. Durant
Omar D. Conger	W. S. Major	H. Meno

Sincennes-McNaughton Line, Montreal

Adolphe V. Roy	J. Goulet	N. Rosseau
Alaska	D. Mongeau	W. Provencher
Aurelie G.	J. Bibeau	J. Laviolette
Denise, S.	J. Millette	F. Thuot
Edouard, G.	P. Aussant	N. Gingras
Emma L.	A. Rajotte	W. Blette
Ethel	U. Latraverse	F. Denis
F. Dupre	G. Mongeau	H. Lagasse
Hudson	C. Legault	Noe Rosseau
John Pratt	I. Beaudry	P. Cournoyer
Mathilda	J. Cournoyer	A. Lemay
Nathalie R.	A. Goulet	G. Heroux
Rival	S. Parisien	N. Lavallee
Rosalie L.	J. Mongeau	H. Beaulieu
Sin-Mac	Z. Legault	A. Baribeau
Spray	L. Lemay	A. Rousseau
Virginia	P. Bibeau	F. Rousseau
Yvon	J. Bibeau	O. Paul

Temiskaming Navigation Co., Ltd., Haileybury, Ont.

Jubilee	J. F. Brown	.....
Meteor	D. E. Burns	J. B. Seguin
Silverland	J. Burns	.....
Temiskaming	J. J. Ladouceur	.....

Turret Crown, Ltd., Toronto

Turret Crown	T. Johnston	G. Dennison

Three Rivers Steamship Co., Montague, P.E.I.

Enterprise	A. C. Reed	John Fraser

Upper Ottawa Improvement Co., Ottawa, Ont.

Albert	J. Snowdon	J. Desrochers
Alert	A. Stewart	P. Rouleau
Alex. Fraser	T. Draper	D. McKay
Alexandra	E. Gray	S. Beaudette
C. B. Powell	J. Ellis	J. Razeau
Castor	D. Farquharson	B. Lavoie
E. H. Bronson	J. C. Merchant	L. Boisvert
G. B. Greene	J. Chartier	G. Noel
G. B. Pattee II	A. G. Smith	J. Hammel
Hamilton	W. J. Toner	R. Spooner
Hercules	P. Leblanc	R. Mashka
Hiram Robinson	J. Ricard	J. Ralston
Lady Minto	F. M. Burns	W. Desrochers
Mink	C. Hutchison	H. Bradley
Pembroke	O. Blondin	H. Latour
Pollux	C. Thrasher	P. Ferrigan
Samson	M. Russell	M. Fournier
Wabis	L. King	D. Tierney

Measurement Fees on Vessels for Registration Purposes.—An order in council has been passed cancelling the schedule of fees, fixed in 1874, which measuring surveyors of shipping are entitled to charge for measuring vessels for registration, and substituting the following:,—For vessels under 50 tons net register, $3.50; from 50 to 100 tons, $5; 100 to 200 tons, $6.50; 200 to 500 tons, $8; 500 to 800 tons, $10; 800 to 1,200 tons, $12; 1,200 to 2,000 tons, $15; 2,000 to 3,000 tons, $17; 3,000 to 5,000 tons, $20; 5,000 tons and up; $25. Every measuring surveyor of shipping shall, when required to travel for the purpose of making any such measurement, be entitled to receive the actual living and travelling expenses incurred by him, not to exceed 10c. a mile actually and necessarily travelled by him for the purpose named.

Investigation Into the Stranding of the s.s. Cobequid.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Captains Neil Hall and J. W. Harrison, as assessors, held an investigation at Halifax recently into the stranding of the British steamship Cobequid, formerly Goth, official no. 98,866, on Trinity Ledge, Bay of Fundy, Jan 13, owned by the Royal Mail Steam Packet Co., of London, and engaged in the Canadian-West Indian mail service, during a voyage from Demorara and way ports to St. John, N.B., with a full cargo and 11 passengers, and mails, sailed from Bermuda on Jan 9, 1914. Everything appears to have gone well during the run from Bermuda and good observations were apparently obtained at noon of Jan. 12, but as all the ship's logs, books, notes and charts were lost, no written record of the positions was available at the investigation, although the course and distance to a position 10 miles south of Seal Island light was given as north 6° west true, distance 96 miles. Seal Island Light was sighted about 10.39 p. m. on Jan. 12, and at 10.53 p.m. a cross hearing of Seal Island light and the Blonde Rock lighted buoy was obtained, and at 11 p. m., the course was altered to N 40° W (true), apparently with the idea of making the Yarmouth Fairway lighted buoy. At 12.55 a.m. of Jan. 13, Seal Island light bore east (true) distance about five miles. Shortly after this the weather became thick with heavy snow squalls, and the wind freshening from northwest to west northwest, to force about 8 to 9 (moderate to fresh gale). Soundings had been taken with the patent sounding machine every half hour during the night; but apparently they did not come in with the ship's assumed positions, and the log line appears to have fouled the sounding wire during the casts taken after midnight, which interfered considerably with the time of obtaining the soundings, and also must have had some material effect on the log's showing, which, under the prevailing weather conditions and the fouling, could not have been very reliable. About 4 a.m. the course appears to have been altered to N 15° E (north true), with the supposition that the ship was off the Fairway buoy, (although nothing had been sighted since losing sight of the light on Seal Island, shortly after 1 a.m.), and it also appears, with the intention of sighting Cape Fourchu light, and the vessel proceeded on that course until she struck the Trinity Ledge at about 6.05 a.m., Jan. 13. Just before she struck the master sighted the broken water ahead, and ordered the helm hard astarhoard but the vessel had hardly started to swing to port when she struck the ledge and almost immediately commenced to make water fore and aft.

The fires were drawn almost at once, and within an hour of the stranding the engine room and stokehold were full of water, although all available pumps had been started immediately after the stranding occurred. The passengers and most of the crew were taken off the wreck by the small coasting steamship Westport on the evening of Jan. 14, after suffering great hardships during the whole 36 hours, having been forced by the rising tide to take shelter in the master's room and ladies' cabin, which were situated on the upper deck, being the only place available above water, and without heat, and practically without food, and were ultimately landed in Yarmouth, N. S., that night. The master and several members of the crew remained on board until the following morning, on account of the boats not being able to return from the rescuing steamer, having been damaged alongside of her, and darkness coming on. They were then taken off by one of the Canadian Government steamships, and landed at St. John, N. B. The ship and cargo are considered to be a total loss.

The court is unanimous in its opinion that the stranding and ultimate loss of the Cobequid was caused by the grave error of judgment of John Howson, the master, inasmuch as when at 4 a.m. on the day of the stranding, he saw that the weather conditions at that time were so bad, and likely to last, and with a strong gale blowing on to the land, he was not justified in attempting to pass inside of the Lurcher Shoal, especially as he was practically ignorant of the conditions of the tidal streams in that locality, and in the court's opinion should have hauled his vessel out to the westward, into deep water, where there was ample sea room to handle her until such time as the weather cleared, or he was able to proceed with safety, and he was not justified in assuming that the Lurcher light vessel was not on her station on the morning of the stranding, simply because she happened to be away from it, undergoing the usual annual repairs and overhauling, when he passed down the Bay of Fundy in Nov., 1913, as she is a permanent aid to navigation, as is shown in the list of lights, etc., and on the Admiralty charts, and was on her station at that time. The court therefore severely censures the master; but on account of the very efficient and satisfactory manner in which everything was carried out on board his ship for the safety of the passengers and crew, after the stranding, does not deal with his certificate. It was unfortunate that the master was unable to give the exact position of his vessel by wireless when she stranded, although under the weather conditions it would not appear that a rescue could have been effected much before the time when it actually occurred.

Icebreaking Steamship for the St. Lawrence River.

We are officially advised that the contract for the construction of a large icebreaking steamship for the St. Lawrence River service has been awarded to Canadian Vickers, Ltd., Montreal, for $998,593. Delivery is to be made by the fall of 1915. The chief dimensions are: length, 292 ft.; length between perpendiculars, 275 ft.; breadth moulded at low water line, 56 ft.; breadth in extreme, 57 feet; depth moulded, 32 ft.; draught, mean, 19 ft.; horse power, 8,000.

Designs have been prepared by Chas. Duguid, Naval Constructor for the Department of Marine, and it is intended to have this vessel one of the most modern icebreakers in the world. It is announced that work will be commenced on her during June, and the builders are pushing forward construction of the necessary buildings, etc., at their plant at Maisonneuve. All the materials which it is possible to obtain in the Dominion will be so purchased, but it is said that the boilers and machinery for the vessel will be built at the works of Vickers, Ltd., in England, as the complete machinery and boiler plants at Maisonneuve cannot be finished in time for the equipment of the vessel with locally made machinery. P. L. Miller, Manager, Canadian Vickers, Ltd., was, before his present appointment, attached to the Royal Corps of Naval Constructors.

The G. T. Pacific Coast Steamship Co.'s s.s. Prince Rupert has been replaced on her route, after having completed her annual overhaul at Esquimalt.

The Abolition of the North Sydney Harbor Commission.

The Minister of Marine in introducing a bill in the House of Commons recently providing for the transfer to the Crown of the property and rights vested in the North Sydney Harbor Commissioners, stated that for a number of years past, representations had been made to the department by those interested in the welfare of the shipping at that port, that no useful purpose was served by the commission and that it should be abolished and the harbor managed as are many other harbors in the Dominion, by the Marine Department, through a harbor master. It was pointed out, and in the Minister's opinion, established, that the tolls charged by the commission, for shipping entering the harbor, was in the nature of a discrimination against the harbor, and from which no advantage was derived. The commission was authorized to collect dues from all registered vessels of 40 tons and upwards, at the rate of 1c. a ton. The total revenues collected in 1912 were $3,917.60, and of this amount, $1,637 was paid as salaries to commissioners and harbor masters, and practically the whole of the balance was expended on repairs to the breakwater at the north bar. Vessels at Sydney are exempt from such dues, and it is contended that shipping at both ports should be placed on an equal footing. The liabilities of the commission are placed at about $800, and the assets are of considerable value. Under the proposed legislation the liabilities will be taken over with the assets, and the management of the harbor placed under the Marine Department. A harbor commissioner will be appointed and paid, as other harbor commissioners are, by commission on dues collected, to a specified amount, and it is proposed that the legislation shall become effective, Jan. 1, 1915.

In the discussion which followed the Minister's remarks, it was stated that the dues as now existing, will be abolished, and the shipping placed on exactly the same footing as that entering Sydney, where sick mariners' dues, and others of a similar nature are paid, and from which the harbor commissioner will be paid, as provided by the Harbor Commissioners Act.

The rates charged at Sydney, and which will be adopted at North Sydney, are as follows:—For vessels up to 50 tons register, 50c.; from 50 to 100 tons, $1; 100 to 200 tons, $1.50; 200 to 300 tons, $2; 300 to 400 tons, $2.50; 400 to 500 tons, $3; 500 to 700 tons, $4; over 700 tons, $5. Collections will only be made twice on the same vessel in any one year. It is proposed that the act shall become effective Jan. 1, 1915.

Shipping Statistics for 1913. The statistics of shipping, which have been submitted to the House of Commons, show that during 1913, there were 8,545 vessels on the Canadian register, valued at $26,908,950. The total tonnage was 896,965 tons, and 43,968 persons were engaged in the marine service. Of the total number of vessels registered, 3,847 were steam, with a tonnage of 711,512. The value of new vessels, of which there were 344, added during the year, was $1,808,380.

R. E. McDonald, Local Manager, Pacific Coast Steamship Co., Vancouver, is reported to have stated recently that the statement appearing in the press to the effect that the Company proposed to abandon its summer tourist service to Alaska, is erroneous. The service will commence June 13 and continue until Aug. 18, the steamships City of Seattle and City of Spokane being utilized.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

88. Mar. 23. Ontario, Georgian Bay, Byng Inlet, buoyage, day beacons.

89. Mar. 24. New Brunswick, south coast, Bay of Fundy, off Negro Head, submarine bell buoy to be discontinued.

90. Mar. 24. New Brunswick, south coast, Bay of Fundy, approach to St. John, submarine bell buoy to be moored near Black Point gas and whistling buoy.

91. Mar. 24. New Brunswick, St. John River, Milkish Inlet, McColgan Point, lighthouse established.

92. Mar. 24. New Brunswick, St. John River, Milkish Inlet, Bayswater, lighthouse and fog bell established.

93. Mar. 24. Nova Scotia, Madame Island and Gut of Canso, change in names of light stations.

94. Mar. 24. Quebec, River St. Lawrence below Quebec, Berthier-en-bas, dredging.

95. Mar. 25. Nova Scotia, Bay of Fundy, Ile Haute, hand fog horn at light station.

96. Mar. 25. Nova Scotia, south coast, submarine bell buoy to be moored near Brazil Rock gas and whistling buoy.

97. Mar. 25. Nova Scotia, south coast, Lunenburg Bay, Sculpin shoal, bell buoy to be replaced by gas and bell buoy.

98. Mar. 25. Quebec, River St. Lawrence, Les Mechins, pole light on wharf, correction.

99. Mar. 25. Quebec, River St. Lawrence, Lark reef, change in color of gas buoy light.

100. Mar. 25. Quebec, River St. Lawrence below Quebec, off Grande Pointe, change in color of gas buoy light.

101. Mar. 25. Quebec, River St. Lawrence, north channel, eastern narrows of North Traverse, change in color of gas buoy light.

102. Mar. 27. Quebec, River St. Lawrence, Lake St. Francis, upper entrance to the Soulanges Canal, gas buoy to be placed temporarily, change in position of gas buoy.

103. Mar. 27. Quebec, River St. Lawrence, Lake St. Francis, Port Lewis, gas buoy withdrawn.

104. Mar. 27. Ontario, River St. Lawrence, Glengarry Point, light discontinued.

105. Mar. 27. Ontario, Lake Erie, Port Colborne and its approaches, Port Burwell, Port Stanley, and entrance to Rondeau harbor, plans issued.

106. Mar. 27. Ontario, River St. Mary, westward of Vidal shoals, gas buoy to be established at junction of channels.

107. Mar. 27. Ontario, Lake Superior, head of River St. Mary, Gros Cap reefs, gas and bell buoy to be established.

108. Mar. 27. United States of America, Lake Erie, Detroit River mouth, Detroit River light station, characteristic of light to be changed.

109. Mar. 28. British Columbia, Chatham Sound, Metlakatla Bay, Alford reefs, gas buoy to be withdrawn.

110. Mar. 28. United States of America, Juan de Fuca Strait, Ediz Hook light station, intended change in character of light.

111. Apr. 3. Quebec, River St. Lawrence, Cape Salmon light station, intended change in character of light.

112. Apl. 3. Manitoba, Hudson Bay, Port Churchill, Esquimaux beacon destroyed by storm.

113. Apr. 3. Ireland, west coast, Clew bay, Clare Island, alteration in character of light.

114. Apr. 7. British Columbia, list of buoys, beacons and day marks on the Pacific coast of Canada, third edition.

115. Apr. 7. British Columbia, Vancouver Island, east coast, Kelp Bar, gas and bell buoy to be withdrawn.

116. Apr. 7. British Columbia, Cordero Channel, northward of Erasmus Islands, unchartered rock.

117. Apr. 7. British Columbia, Fitzhugh Sound, Addenbrooke Island, lighthouse and fog bell established.

118. Apr. 9. Ontario, Lake Erie, Kingsville light station, hand fog horn established.

119. Apr. 9. Ontario, Georgian Bay, Giants Tomb Island, Bennet Bank, gas buoy to be replaced by gas and bell buoy.

120. Apr. 9. Ontario, St. Joseph channel, Hilton, dredging.

121. Apr. 9. Ontario, St. Joseph channel, Walker River, dredging.

122.. Apr. 14. Nova Scotia, south coast, Mahone Bay, Princess Inlet and approach, list of buoys.

123. Apr. 14. Nova Scotia, south coast, Musquodoboit Inlet, buoys established.

124. Apr. 14. Nova Scotia, Cape Breton Island, east coast, St. Ann harbor entrance, buoyage.

125. Apr. 15. British Columbia, Prince Rupert harbor, hydrographic notes.

126. Apr. 17. Ontario, Lake Erie, Pelee Passage, wreck northwestward of lighthouse, gas buoy to be placed temporarily.

127. Apr. 17. Ontario, Lake Huron, Goderich, change in character of light.

128. Apr. 18. New Brunswick, south coast, Bay of Fundy, Musquash, intended change in character of light.

129. Apr. 18. New Brunswick, south coast, Bay of Fundy, Quaco light station, intended change in character of light.

130. Apr. 20. New Brunswick, Bay of Fundy, east of Deer Island, Sandy Island ledge, spindle erected.

131. Apr. 20. New Brunswick, Bay of Fundy, east of Deer Island, ledge northeastward of Tinker Island, spindle erected.

132. Apr. 20. Nova Scotia, north coast, Northumberland Strait, entrance to Pictou, position of Skinner reef gas and bell buoy, correction.

The Wreck of the Bridgeport.—In answer to questions in the British House of Commons recently, in connection with the loss of the Dominion Coal Co.'s s.s. Bridgeport, the President of the Board of Trade stated that the vessel which left Sydney, Nov. 1, for Montreal had not since been heard of. As at the time of the loss and for some months previously, she had been trading on the Canadian coast, the Canadian courts, which will hold an investigation, are in a much better position to secure material information regarding the casualty than could a court of investigation in Great Britain. The President was unable to say if the statements reported to have been made by officers of the vessel in communications to their relatives, as to the condition of the vessel at various times, were correct, but if any statements bearing on the condition of the vessel, or on its loss, can be supplied to the Board of Trade, they will be forwarded to the Canadian authorities, to whom certain information has already been sent. The statements alluded to are chiefly to the effect that when the vessel arrived at Sydney, N. S., May 23, 1913, her 'thwartship beams were put ashore to facilitate working of the cranes, and were left there; that on the voyage of Sept. 8, at Montreal, the vessel's cargo was 11,600 tons on a draught of 26 ft. 11 ins., whereas her builders gave her deadweight capacity as 11,000 tons on a draught of 25 ft. 1⅜ ins.; that the compass had shifted a point owing to the change of derricks, and was thus the cause of the vessel being put on a wrong course. She was built in Great Britain, and was owned there, being under charter to the Dominion Coal Co. The officers and crew were also from Great Britain.

New Ferry Boat for Montreal-Longueuil Service.

The Canadian Steamship Lines, Ltd., has ordered from G. T. Davie & Sons, Levis, Que., a single screw ferry boat, to be called Longueuil, and to replace the present boat of that name. Her dimensions will be:—length over all, 169½ ft.; extreme beam, 43 ft. 2½ ins.; depth moulded, 12¼ft. She will have one Scotch marine boiler, and the engine will be fore and aft compound, 17-34 ins. by 36.

She will be built to Lloyds requirements, and will be constructed suitably for ice breaking conditions. She will be practically fire proof, all decks and superstructure being of steel. She will be fitted with al conveniences, and will be of a type representing the most modern ideas in ferry steamboat building.

The machinery to be installed in this vessel, is being transferred from the company's s. s. Dundurn, which has been dismantled at Polson Iron Works, Toronto.

Marine Engineers Ask for Higher Pay.

Midland (Ont.), Council No. 12, National Association of Marine Engineers of Canada, has issued the following circular letter to vessel owners on the Great Lakes, etc.:—"Wages of mechanical engineers have increased very little in the past 10 years, while wages in other trades have advanced very considerably. The cost of living has become much higher, many necessaries of life being 100% higher than they were 10 years ago. There is not sufficient inducement to young men to become marine engineers, and, consequently, the number of capable men will soon become far less than the demand. Our duties and responsibilities are increasing, while our salaries are not. We ask for either chief or second engineers an increase for 1914 of at least 10% over 1913."

Great Lakes Transportation Co., Ltd., has been incorporated under the Dominion Companies Act, with an authorized capital of $1,000,000, and office at Midland, Ont., to own and operate steam and other vessels and carry on a general navigation business. The incorporators are:—H. W. Richardson, Kingston; James Playfair, D. L. White and F. W. Grant, Midland; and W. J. Sheppard, Waubaushene, Ont. H. W. Richardson is a member of the firm of John Richardson and Son, Ltd., Kingston, which owns a number of grain carrying vessels. James Playfair was Vice President and Managing Director, Richelieu and Ontario Navigation Co., prior to the sale of the properties to Canada Steamship Lines, Ltd. He played a prominent part in the various amalgamations and absorptions leading up to the formation of that company, commencing with the acquirement of the vessels and navigation properties of R. O. and A. B. Mackay, Hamilton, which, with the Midland Navigation Co., and the Empress Transportation Co. of Midland, formed Inland Lines, Ltd., and following on through the negotiations covering the control of the Northern Navigation Co., and the acquirement of the Niagara Navigation Co., and all the various constituent parts of the completed amalgamation. W. J. Sheppard was President of the Northern Navigation Co. for several years prior to its sale to the Richelieu and Ontario Navigation Co.

The engagement is announced of R. H. WHITE, Managing Engineer Marconi wireless telegraph station, Glace Bay, N.S., to Miss J. Henshaw, of Stoke-on-Trent, Eng.

Atlantic and Pacific Ocean Marine.

The White Star Line is reported to have placed an order for the building of another vessel of the Adriatic type, with a displacement of 33,000 tons.

F. S. Appleby, for the past eight years Agent, Allan Line Steamship Co., Winnipeg, resigned, Mar. 31, to return to Leeds, Eng., where he will open a general steamship and immigration office.

The Cunard Steamship Co. has declared a dividend of 10% for the year ended Dec. 31, 1913. The annual report showed profits of $6,383,975, including $444,820, brought forward from 1912.

The C. P. R. s.s. Montreal from Antwerp to St. John, N.B., put in at Hailfax, N. S., Apr. 3, having had her rudder post broken during a storm. The steering for the last 400 miles was done by means of the propellers.

The Allan Line s. s. Alsatian, which sailed from Halifax, N. S., Mar. 28, arrived at Liverpool, Eng., Apr. 3, having completed the voyage in 5 days 20 hours, which is considered a remarkable performance, seeing that she took a more southerly, and therefore longer, route than is usual.

The passenger traffic of the White Star-Dominion, Canada, and Austro-American Lines, which has hitherto been jointly managed by P. V. G. Mitchell and R. F. Macfarlane, Montreal, will in future be in charge of the former, Mr. Macfarlane having retired, after 40 years service.

The Allan Line has announced that its new steamships, Alsatian and Calgarian, will make Quebec their Canadian terminal port instead of Montreal, owing to the lack of depth in the channel between Quebec and Montreal. The Calgarian is due at Quebec, May 8, and the Alsatian, May 22, on their first trips up the St. Lawrence.

The Royal Mail Steam Packet Co. is fitting out the s. s. Chaudiere for service between the Maritime Provinces and the West Indies, to take the place of the wrecked s. s. Cobequid. The Chaudiere was built in 1899, is 3,986 tons gross, driven by twin screws, and is equipped with all the latest devices for handling cargo for the West Indies trade. She will have accommodation for 50 saloon, 80 second and 120 third class passengers.

It was announced in Montreal, Apr. 18, that the C. P. R. had decided to make calls at Manila, Philiipine Islands, commencing June 11, the s. s. Empress of Russia being the first vessel calling there. The time taken on the voyage from the Canadian port to Manila will be 17 days, against 28 days previously taken by vessels from any North American port. It is stated that the service is being inaugurated after urgent requests by large commercial interests in the U. S.

The Dollar Steamship Co. is having another steamship built in Scotland, to be named Harold Dollar. It is stated that she will, as have other vessels of the same ownership, be placed on the British register. Robert Dollar, the head of the company, is reported to have stated recently that the new vessel will cost about $280,000, and that to build a similar vessel in the U. S. would cost about $600,000, and then it would not be as good. He also compared the advantages of having the vessels operated under the British regulations, as against those of the U. S.

The Roth Line has decided to enter the Canadian trade, and will run a freight service between Montreal and Antwerp, the steamships Boldwell and Coningsby being utilized in the service, sailing from Antwerp, Apr. 20 and May 1, respectively. It is said that the service will be operated in connection with the Grand Trunk and other railways, and will be outside the North Atlantic Freight Conference. The report also states that a ten year contract has been entered into with a European firm for cargoes of pulpwood eastbound. T. Harling, 407 Board of Trade Bldg., Montreal, is the Canadian agent.

It is announced from Ottawa, that carrying out its part of the agreements arrived at by the recent marine convention in London, Eng., the Marine Department is co-operating with the U. S. Government, which latter has two vessels patrolling the North Atlantic route making observations and reports regarding ice conditions. An officer is to be placed at Cape Race, and all reports as to the position of ice and icebergs will be sent to him. Two wireless telegraph messages will be sent out from that point each day giving all vessels at sea, information as to the ice, and during the period between June and October, similar information will be dispatched from the station at Belle Isle.

The Allan Line s. s. Calgarian, which has recently been completed at Glasgow, Scotland, underwent her trials during March. The speed trials consisted of seven double runs on the measured mile, commencing at 11 knots and increasing gradually to full speed. On the last run, the mean speed was 20.634 knots, which is about 1½ knots more than she will be required to do on regular service. The propelling machinery consists of four Parsons type turbines, supplied with steam by six double ended and four single ended boilers placed in two separate compartments, equipped with Howden's forced draught. The port wing shaft is driven by a high pressure turbine exhausting into an intermediate pressure turbine driving the starboard wing shaft. The two inner shafts are each driven by a low pressure turbine, and a powerful astern turbine is placed in the same casing. The passenger accommodation is arranged for 200 first class, 400 second class and 1,000 third class, and in addition a crew of about 450 will be carried.

Maritime Provinces and Newfoundland.

The Governor General in Council has approved of the bylaws of the Pilotage Commissioners for the pilotage district of Shepody Basin, N. B.

The car ferry steamship which is being built at Newcastle-upon-Tyne, Eng., for service between Cape Tormentine, N. B., and Carleton Point, P. E. I., will probably be launched in June.

The Minister of Public Works, in response to the representations of a deputation from Charlotte county, N.B., recently, promised that the next estimates would include an amount for the development of the St. Croix River for harbor purposes.

Furness Withy and Co. have announced the withdrawal of their s.s. Swansea Trader, which has been running for some time between Halifax and Charlottetown, P.E.I. The vessel is to return to England, and it is not the company's intention to resume the service. They have decided to withdraw entirely from the coastwise trade.

The Dominion Government Customs patrol steamship Margaret arrived at Halifax, N. S., from England, April 13, after a stormy passage, occupying 19 days. She was fully described in Canadian Railway and Marine World for Dec., 1913, and a preliminary description with outline illustration was given in our issue of Sept., 1912.

Harbor improvement work has been recommenced at West St. John, and it is announced that two additional steamship berths will be completed and ready for occupation by Dec. 1. The Public Works Department has requested the City Council to send in its plans of the area for the two steamship berths which it wants the Government to build on the eastern side of the harbor.

The New Brunswick courts have issued an order for the winding up of the May Queen Steamship Co., of Gagetown, on the ground that 25% or more, of the capital stock has become impaired, or lost, or unavailable, and for other reasons. It was stated that the s.s. May Queen is practically the only asset. There is a first mortgage on the vessel for $13,000 and a second mortgage for $2,000, and in evidence it has been stated that the saleable vessel is not worth more than $10,000.

Province of Quebec Marine.

The Governor General in Council has approved of the Quebec Harbor Commissioners' bylaws, which were recently revised and amended.

The actual construction and equipment work on the Quebec Harbor Commissioners' elevator at the Louise docks has been completed, and the structure handed over to the Commissioners by the contractors, Canadian Stewart Co. Work was commenced in March, 1913.

The Marine Department will receive tenders to May 4, for the construction of a steel single screw hopper barge, to be delivered at Sorel, Que. Each tender must be made with the distinct understanding that the barge must be built in Canada.

H. M. Cameron, who has been appointed manager of the shipyard, Canadian Vickers, Ltd., Maisonneuve, Montreal, and who has been in the service of Vickers, Ltd., and its predecessor, for 23 years, was entertained by the officials at Barrow in Furness, Eng., and presented with a number of articles before leaving there for Montreal.

La Compagnie de Navigation St. Laurent-Richelieu, Ltd., has been incorporated under the Dominion Companies Act, with $90,000 capital, and office at Montreal, to own and operate steam and other vessels, and carry on a general navigation business. A Lamothe, E. Charron, St. Denis, Que., and L. Morin, A. D. Denis and L. A. Beriau, Montreal, are the incorporators.

The Public Works Department has completed dredging on both sides of the head of the pier at Pointe Verte, Trou de Berthier, to allow of vessels lying along either side, with a minimum depth of 10 ft. at low water. On the west side of the pier, the basin is 200 ft. long by 150 ft. wide, and on the east side, 175 ft. long by 100 ft. wide, and there is 17 ft. of water along the outer face.

The National Navigation Co., Ltd., of Quebec, which is in liquidation, will not, we are officially informed, resume business. The company owned the steamship Natashquan, formerly Polino, built in Sunderland, Eng., in 1870. She is screw driven by engine of 98 n.h.p., and is of the following dimensions, length 198.7 ft., breadth 27.3 ft., depth 15.5 ft.; tonnage, 991 gross, 642 register. She will be sold by the liquidators but no offers have been received.

The improvements in Quebec harbor for 1914, as outlined by the Harbor Commission, involve an expenditure of approximately $2,273,559. The work comprises the dredging of a trench for a quay wall and channel approach, extension to the Louise embankment, railway and delivery yard extensions, trackage for new grain elevator, trackage for bulkhead shed in connection with car ferry terminals, purchase of Indian Cove,

purchase of four locomotives, grain loading galleries, purchase of 100 scows, and completion of retaining wall at Lampson's Cove for 1,400 ft.

A deputation representing Quebec and Levis Boards of Trade waited on the Postmaster General, Apr. 11, with the view of urging the Government to grant a subsidy for the establishment of a ship building plant at Levis. In reply, the Postmaster General stated that he did not think it reasonable to ask the Government to subsidize such a project. The shipbuilding yard would be a paying proposition, and could be run successfully by any enterprising company. The dry dock which had been commenced there was going to be a large expense to the Government, and would not be a paying business. The Government intended to encourage local shipbuilding, and all future contracts for building vessels, whether executed by Canadian or foreign companies, would have to be carried out in the Dominion. There was no intention of subsidizing outside millionaire concerns who wished to come into competition with the Canadian trade. It was also the intention shortly to call for tenders for the building of two hopper barges, which were to have been built at the Government yards at Sorel.

Ontario and the Great Lakes.

The Brockville Transportation Co.'s s. s. Senator Derbyshire has had a new Scotch boiler, 13 by 11 ft. fitted, by Polson Iron Works, Toronto.

Capt. Wm. Allen, a well known Great Lakes mariner, died at Ford, Ont., Apr. 20, aged 83. He came to Canada from England in 1839, in a sailing vessel.

Canada Steamship Lines, Ltd., which acquired the s.s. Geronia, when it took over the Ontario and Quebec Navigation Co., has changed the name of the vessel to Syracuse.

The Port Huron and Sarnia Ferry Co.'s ferry steamboat Grace Dormer was found to be on fire, Apr. 12, and was considerably damaged. The fire was caused by the watchman overturning a lamp.

The Niagara, St. Catharines and Toronto Navigation Co.'s s.s. Dalhousie City was the first vessel to enter Toronto harbor this season, arriving from Port Dalhousie, Apr. 4. The captain was awarded the usual silk hat by the harbor master.

The Keystone Transportation Co. of Canada's s. s. Keynor was launched at Londonderry, Ireland, Apr. 7, and is expected to sail for Canada about the middle of May. She will be in charge of Capt. Wm. Tinmouth.

The C. P. R. Upper Lakes Service s. s. Manitoba has been thoroughly overhauled at Collingwood, and has been fitted with new boilers and steam piping, as well as new weather bulwarks forward, new hawse pipes and stockless anchors.

H. H. Gildersleeve, Manager, Northern Navigation Co., Sarnia, is reported to have stated, Apr. 8, that the headquarters for the company's Georgian Bay service will be Owen Sound in future, instead of Collingwood, the latter place, however, remaining as a port of call.

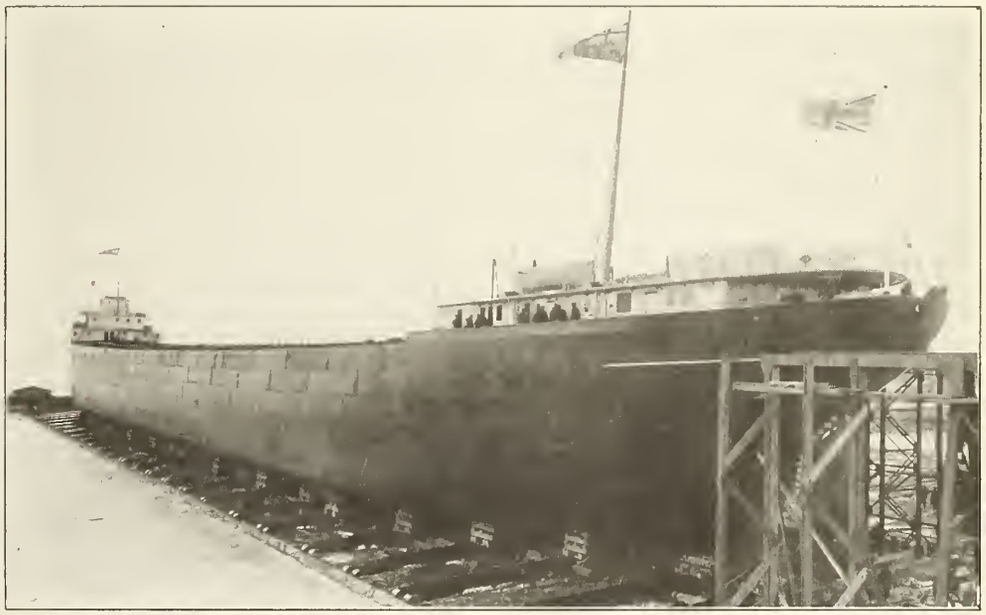
A small steamboat has been completed at Collingwood, recently, for missionary work at Herschel Island, near the mouth of the Mackenzie River, and has been shipped by rail to Athabasca Landing, Alta., whence she will proceed by water. She has been named Atkoon.

The Public Works Department has awarded the contract for Sec. 2 of the Trent Canal, being the portion between Lake Simcoe and Georgian Bay, to the Inland Construction Co., Toronto, the amount approximating $712,260. The contract for the Severn River section has been awarded to the York Construction Co., Toronto.

There are under construction at Polson Iron Works, for the Canadian Stewart Co., for harbor work at Toronto, two dredge hulls, and one steel derrick scow. The dredge hulls are each 170 ft. long, 42 ft. beam, and 12 ft. deep, and they will be equipped as 24 in. suction dredges. The scow is 140 ft. long, 40 ft. beam, and 11 ft. deep.

Work has been commenced on the construction of the sea wall near the mouth of the Mission River at Fort William. The contract was awarded by the Dominion Government to the Thunder Bay Construction Co. It is estimated that the work will occupy about 21 months and involve an expenditure of about $340,000.

The Marine Department has issued a chart with plans of the harbors on Lake Erie, comprising Port Colborne and its approaches, Port Burwell, Port Stanley, and the entrance to Rondeau harbor. These have been specially prepared by the Hydrographic Survey of the Department of Naval Service.



The s.s. W. Grant Morden, Canada Steamship Lines, Ltd., just before the launching.

The Windsor and Pelee Island Navigation Co.'s steamboat Pelee has been completed at Collingwood, and handed over to her owners. She is 146 ft. long, 24 ft. beam, and built of steel throughout. The machinery consists of triple expansion engines, with cylinders 12½, 21 and 34 ins. diar., and 21 ins. stroke, developing 500 h. p. Steam is supplied by a Scotch marine boiler 12½ by 11 ft.

Canada Steamship Lines s. s. W. Grant Morden was launched at Port Arthur, Apr. 4, the christening ceremony being performed by Lady Williams-Taylor of Montreal. This vessel, details of which were given in Canadian Railway and Marine World, March, pg. 142, is the largest freighter on the Great Lakes. The record for the largest vessel was previously held by the Col. Jas. M. Schoonmaker, owned by the Shenango Steamship and Transportation Co., Cleveland, Ohio.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for March, as follows,—Superior 601.91; Michigan and Huron 580; Erie 571.46; Ontario 245.67. Compared with the average March levels for the past ten years, Superior was 0.25 ft. above; Michigan and Huron 0.14 ft. below; Erie 0.34 ft. below, and Ontario 0.22 ft. below. It was anticipated that during April, Superior would remain stationary, Michigan and Huron would rise 0.3 ft., Erie 0.7 ft., and Ontario 0.6 ft.

Canada Steamship Lines will commence service on its Niagara Division, May 2, when the s. s. Corona will open the Niagara River season. The double service will go into effect, May 23, and during June the full service of 6 trips daily will commence, with the exception of the Sunday service, which will not be started until July. The s. s. Chicora will be placed in service about June 20 on the Toronto-Olcott Beach run. On the Richelieu and Ontario Division, between Toronto, Rochester, Thousand Islands and Montreal, a daily service will be run this season instead of tri-weekly as hitherto.

The Ontario Car Ferry Co., which, as stated in our last issue, has ordered another car ferry to operate between Cobourg, Ont., and Charlotte, N. Y., has a capital of $500,000, of which the G. T. R. owns 2,503 shares, and the Buffalo, Rochester and Pittsburgh Ry. 2,497 shares. The officers are, President, E. J. Chamberlin, President, G.T.R.; Vice President, W. T. Noonan, President, Buffalo, Rochester and Pittsburgh Ry.; Chairman Executive Committee, H. G. Kelley, Vice President, G. T. R.; Secretary-Treasurer, Frank Scott, Treasurer, G. T. R.; Manager, W. H. Smith, Canadian Express Bldg., Montreal.

The attempt to raise the Keystone Transportation Co.'s s. s. Keystorm, which is lying in deep water near Kingston, work on which was commenced last fall, will be resumed as soon as the weather permits. The diver who went down last year reported the vessel was in very good condition considering the time she had been under water. She was wrecked in Chippewa Bay, Oct. 26, 1912, her cargo being valued at about $300,000. The salvage has been undertaken by A. J. Lee, Westmount, Que., with the view chiefly of developing certain of his theories as to the use of compressed air for such purposes, in an extreme case, such as the Keystorm has been decided to be.

The St. Lawrence and Chicago Steam Navigation Co.'s new freight steamship, which is under construction at Collingwood, is being built with special attention to the

hatches, and when completed, it is claimed she will be one of the staunchest vessels on the lakes. Hatches will be spaced 24 ft. centres, instead of 12 ft., and will have openings 10½ ft. in the fore and aft direction. Instead of telescopic steel covers to the hatches, 4 ins. spruce will be used, and these will be fitted inside of a patent hatch rest bar, and supported underneath by portable steel strongbacks, fitted fore and aft, and also athwartships. The hatch covers will be fastened by a patent hatch fastener having proved gripping power.

The s. s. Dundurn, owned by Canada Steamship Lines, Ltd., and which has been dismantled, will be utilized as a barge. The machinery has been transferred to the new ferry s. s. Longueuil, under construction at Levis, Que. The Dundurn was built in Detroit, Mich., in 1882, for the Pere Marquette Rd., and first named Pere Marquette, and was operated between Chicago and points on Lake Michigan. She was later bought by R. O. and A. B. Mackay, Hamilton, and run between Hamilton and Montreal, under the Hamilton and Montreal Navigation Co. Along with other of the Mackay properties, it was acquired by Inland Lines, Ltd., which was, in turn, acquired by the Richelieu and Ontario Navigation Co., now Canada Steamship Lines, Ltd.

With the reopening of navigation, some arrangements are being discussed regarding the possible salving of some of the vessels lost in the great storm of Nov. 9. The s.s. I. W. Nicolas, which was purchased and salved by the Reid Wrecking Co., has been docked at Port Huron, and it is stated that the same company is negotiating for the salving of the s.s. Howard M. Hanna Jr., having already purchased the cargo of 10,000 tons of coal. The underwriters are reported to have declined an offer of $10,000 for the s.s. Charles S. Price, as she now is, and it is stated that unless a better offer is received, she will not be sold until after an examination early in the season. The owners of the John A. McGean contradict the report that they intend to search for the vessel, and state that nothing will be done unless some information is received as to the probable location of the wreck.

Manitoba, Saskatchewan and Alberta.

The name of the steamboat Mikado, no. 112,308, registered at Winnipeg in the name of S. Sigurdsson, Gimli, Man., has been changed by order in council to Grand Rapids.

A dredge, which has been under construction on the Saskatchewan River bank at Pas, Man., was expected to be completed by May 1, after which work will be commenced on two 60 yd. dump scows, all for dredging operations in the neighborhood.

A small steel steamboat has been built at Winnipeg, for Hudson's Bay Co.'s service on shallow rivers. She is 150 ft. long, with 28 ft. beam, and is being shipped to McMurray, Alta., in parts, and will be reassembled and completely fitted up there.

It is reported that the Saskatchewan Steamship and Coal Co., with head office in Minneapolis, Minn., has arranged to operate the steamboat Majestic on the Saskatchewan River between Prince Albert, North Battleford, Sask., and Edmonton, Alta. The boat is mentioned as being 192 ft. long, 46 ft. beam, with stateroom capacity for 200. It is electrically lighted, and equipped with wireless telegraphy. E. J. Newell, Minneapolis, is stated to be President of the company, and R. F. Tompkins, formerly with the Great Northern Ry., Traffic Manager.

British Columbia and Pacific Coast Marine.

The C. P. R. s. s. Princess Mary, which was docked early in the year for extensive alterations, including the addition of 40 ft. to her length, was refloated Apr. 11, and it is expected that she will be ready to leave the builders' hands about the middle of May.

The G. T. Pacific Coast Steamship Co. has been awarded $500 salvage for rescuing a gasoline launch and 16 passengers on Nov. 9, 1913, when the vessel became disabled at the entrance to Vancouver harbor. The company claimed $2,000, and the owners of the launch offered $100.

We are officially advised that the two steamships which are under construction in Scotland for the C. P. R. British Columbia Coast Service, will be named Princess Margaret and Princess Irene, and not Princess Maragaret and Princess Melita, as reported in the daily press. Both of them will be ready for service by the autumn.

The Union Steamship Co. has purchased the British steamship Melmore, formerly owned by the Great Western Ry., for service on the Vancouver-Powell River run. She is about 168 tons register, and has a speed of about 11 knots an hour. She was overhauled at Victoria, and it is expected that she will be ready for service early in May.

The contract for the construction of a marine wharf on the site of the Marine Department's proposed depot on the Songhees Indian Reserve, Victoria, has been awarded to Parks, Tupper and Kirkpatrick, Vancouver, the amount involved approximating $20,450. The contract calls for a wharf of creosoted piles and concrete, about 640 ft. long, and also the grading of about 27,000 ft. of material to the wharf level. It is to be built L shape and will be located immediately north of the Esquimalt and Nanaimo Ry. bridge.

It was reported in our last issue that the British Columbia Government had decided to order a ferry steamboat, at a cost of about $25,000 for the ferry service across the Fraser River at Ladner. We have been officially advised that the steamboat Helen M. Scanlon has been purchased for this purpose. She was formerly owned by the Brooks Scanlon Lumber Co., Vancouver, and was built at Vancouver in 1909. She is paddle wheel driven by engine of 9 n. h. p. Her dimensions are, length 124 ft., breadth 27.2 ft., depth 5 ft.; tonnage 358 gross, 209 register.

The American Yukon Navigation Co., which supplies the White Pass and Yukon Route's direct river service between Dawson and Fairbanks, has acquired all the physical property of the Northern Navigation Co. operating between Seattle, Vancouver and Skagway, for a price reported as approximately $2,000,000. This arrangement was considered necessary in order to care for the company's increased traffic, and will afford a direct through service for the White Pass and Yukon Route, from Skagway, Alaska, through the interior of Yukon Territory and Alaska, to St. Michael, Alaska, 2,172 miles. The American Yukon Navigation Co., Ltd., was incorporated in West Virginia, in April, 1913, to operate steamboats on the Yukon River, in connection with the British Yukon Navigation Co.'s vessels, both lines forming portions of the White Pass and Yukon Route. Two vessels were built at Seattle, and named Alaska and Yukon. After being dismantled they were shipped to White Horse, reassembled and placed in service before the close of navigation on the Yukon, last year.

Welland Ship Canal Contracts.

During 1913, Canadian Railway and Marine World published considerable information with route maps and profiles of the Welland Ship Canal, and detailed drawings of the lock construction.

The Minister of Railways and Canals, in the House of Commons recently, gave some details as to the contracts which have been awarded for the work, and which has been incorporated with the C. R. & M. W. office records, to present the information in as complete and concise a form as possible, as follows:

Section 1, from Lake Ontario, including pier and trestle work at entrance, to bridge 2, and including lock 1, about 3 miles; awarded Aug. 1, 1913; date for completion, Apr. 1, 1917; amount based on schedule rates, $3,487,725; amount deposited by contractors, $200,000; contractors, Dominion Dredging Co., R. Gordon Stewart, President, E. A. Larmouth, Secretary-Treasurer.

Section 2, from bridge 2 to bridge 5, about 4½ miles, including locks 2 and 3; awarded Dec. 31, 1913; date for completion, Apr. 1, 1917; amount based on schedule rates, $5,377,185.75; amount deposited by contractors, $150,000; contractors, Baldry, Yerburgh and Hutchinson.

Section 3, from bridge 5 to about half way between bridges 9 and 10. This section covers the heaviest portion of the whole route, and includes the erection of twin guard gates at Thorold, the single lock 7, the construction of a short stretch of canal below lock 7, and also of the three twin locks 6, 5 and 4 in flight, one flight for downbound vessels and the other for upbound, the three locks overcoming a descent of 139½ ft.; awarded Oct. 4, 1913; date for completion, Apr. 1, 1917; amount based on schedule rates, $10,220,665; amount deposited by contractors, $400,000; contractor, James H. Corbett.

Section 5, from just above bridge 12 to just above bridge 13, about 2¾ miles; awarded Dec. 22, 1913; date for completion, Apr. 1, 1918; amount based on schedule rates, $1,945,788; amount deposited by contractors, $100,000; contractors, Canadian Dredging Co., D. S. Pratt, Manager.

Tenders for section 4A of the new Welland Canal were called for up to Apr. 9, and a contract has been awarded to Maguire and Cameron for a sum aggregating about $84,000. This section covers the building of a supply weir to the old canal, and two covered drains across the dumping ground between the present and old canals. It was the intention to make it a part of section 4, lying directly to the west of it, but it was taken out of that section and made a subsection to expedite matters.

Canadian Northern Vessels Insurance.—The Canadian Northern Ry. interests, which control the companies operating the Campanello and the Uranium, have renewed the insurance on these vessels, which are valued at about £90,000 and £40,000 respectively, but the rates have been increased. Shipping Illustrated states that the Campanello pays 7 guineas against 6½% last year, while the Uranium pays 7 guineas free of damage absolutely, compared with 6 guineas on the same terms last year.

Dr. Vrooman, in a paper read before the Royal Colonial Institute in London, Eng., recently, said that the canal will put an Alberta farmer in the summer about 7 cents a bushel nearer Liverpool and in the winter 15 cents a bushel. In other words, it will add 10 cents a bushel to the value of every bushel of grain to be grown in Alberta.

Investigation Into the Stranding of the s.s. Acadian.

Commander H. St. G. Lindsay, Dominion Wreck Commissioner, assisted by Capts. Jas. Ewart and Jas. McMaugh, as assessors, held an investigation at Toronto, Jan. 30, into the stranding of the s.s. Acadian, no. 124,258, registered in Glasgow and owned by the Canada Interlake Line Ltd., on shoals near Sulphur Island, Lake Huron, on Nov. 9, 1913. She left Cleveland, Ohio, Nov. 8, for Port Arthur, Ont., with 2,540 tons of general cargo; 200 tons of iron gas pipes were stowed on the after part of the upper deck, and 195 tons of bunker coal below, the ship's draught being 15¼ ft. forward and 16¾ ft. aft. She passed Sarnia at 8 p.m. the same day, and at 5.35 p.m. Port Huron light vessel was abeam, and the patent log steamed and set. Everything appears to have gone well during the night of the 8th and morning of the 9th, and a departure was taken from abeam of Point aux Barques light, distance 7 3-10 miles, at 3.50 a.m. on the 9th, the ship then steering N. by W. by compass, and the log showing 68 4-10 miles. The wind appears to have freshend up from the northward with snow at 8 a.m., and at noon was blowing a hard gale, with constant snow, and it appears that the steering became difficult, the ship's head falling off to the westward, bringing the wind and sea on her starboard beam, and occasionally coming right up into the wind and sea and then falling off to the eastward, bringing the wind and sea on her port beam. At 3.15 p.m., during a short clearance in the weather, land was sighted nearly ahead, and also on the port bow, the vessel's head being, it appears, at that time about N. by W. by compass. The land was recog nized by the master as being Thunder Bay Island and was distant about three miles, according to his judgment. He then seems to have decided to take his vessel into Thunder Bay for shelter, and with that idea in view kept the ship away to W. S.W., and after running, as he supposed, three miles, he hauled up to N.W. ½ W., intending to proceed into the Bay and anchor; but while on that course the vessel struck and stranded on a shoal south of Sulphur Island at 4.20 p.m., where she remained with her forward holds full of water until Nov. 19, when she was towed off and ultimately taken to port of Ecorse, Mich., and placed in dry dock for repairs, which were found to be very extensive.

The court, after carefully considering the evidence adduced, is of opinion that the stranding was caused by the poor judgment of the master, inasmuch as he was not justified in assuming, in the position he was, three miles off, what he took to be Thunder Bay Island, without taking means to verify same by a cast of the lead. The events which followed show that he must have been a greater distance than that to the southward of the Island, when he decided to run into Thunder Bay to take shelter, and it was not good seamanship, under the prevailing weather conditions, to attempt to take the proposed shelter, without being perfectly assured of the ship's correct position. It is the court's unanimous opinion that, on seeing that the vessel had made a fairly good course, within a little more than half a point of her intended course from her last point of departure, viz., 7 3-10 miles off Point aux Barques light, the vessel having had sufficient steerage way to bring her up occasionally head to the wind and sea, the proper thing to do under the circumstances when he sighted the land, was to have headed her off to the eastward, and taken her out into deep water, and away from a dangerous lee shore. The vessel, although making heavy weather, was, according to the evidence, able to weather the gale, being in good trim and condition at the time.

The court therefore severely censures the master, Robt. McIntyre, for his error and lack of judgment in trying to take his ship into Thunder Bay during thick, heavy weather, with nothing to guide him, and from a position which could not be assumed to be correct; but on account of his conduct in connection with salving and refloating the vessel, does not deal with his certificate. The court criticizes the fact of this vessel carrying iron pipes on deck, especially at a time when bad weather was likely to be met with, and also expresses surprise that no means whatever were taken to secure the deck load. This appears to the court to be taking an unusual and improper risk, both to ship and cargo, to say nothing of the risk of life and limb to the crew. A patent sounding machine would have been invaluable on this vessel, as, from the evidence on the question of taking casts of the lead, it would appear that under the weather conditions which existed on the afternoon of the 9th, it was considered impossible to use the hand lead. The reasons alleged for this do not appear to the court to be either justifiable or in keeping with ordinary seamanship, for if it were possible and safe, as shown in the evidence, to send someone aft to read the log every hour, along the sea swept main deck, it would be quite safe and practicable to have a man lashed to the rail, on forward deck, under the bridge, who could have used the lead effectively.

The Consolidation of the Canada Shipping Act.

On the introduction of the bill for the consolidation of the Canada Shipping Act, in the House of Commons, Mar. 11, the Minister of Marine said that it had been thought desirable by the department for several years that the different acts having reference to the Canada Shipping Act, should be consolidated, with certain amendments of a more or less lengthy nature. He gave a summary of the various legislation regarding shipping, from the Imperial Merchants Shipping Act of 1854, and amendments and adaptations to Canadian conditions, to the present time, and stated that it is the intention to have the consolidated act based on the latest Imperial legislation, with such substantive alterations as may be considered necessary for the more local conditions.

Part 1 deals with the registration and classification of vessels, covering the power to appoint surveyors of vessels by the Minister, instead of, as at present, by the Governor in Council; the registration of the original managing owners of vessels, as well as changes in ownership; the licensing of such vessels as are exempt from registration; the proper national colors for Canadian vessels; Part 2 deals with the certificates of masters, mates and engineers; Parts 3 and 4 covers the legislation relating to seamen and the shipping of seamen on inland waters, and sick and distressed mariners; Part 5 deals with pilotage, the only important change proposed respecting which is one by which the Minister of Marine constitutes the pilotage authority of Canada. The intention is to have pilotage administration as one system throughout the Dominion, with local pilotage authorities, more under the Department's control than heretofore, with a more uniform administration of the law than has hitherto obtained. A provision will cover the compulsory retirement of all pilots at the age of 70, and vessels trading between Canadian ports and New York, and U. S. ports north of New York, and between Canadian ports and San Francisco, and other U. S. ports north of San Francisco will be exempt from pilotage tolls; Part 6 covers steamship inspection, examination and licensing of engineers; Parts 8 to 18 deal, respectively, with safety, wreck and salvage, special shipping enquiries and courts, lighthouses, buoys and beacons and Sable Island, public harbors and harbor masters, port wardens, coasting trade of Canada, delivery of goods, liability of carriers by water, legal proceedings and supplemental matter.

It was decided on the second reading, Mar. 12, to refer the bill to a select committee, and to have it printed and distributed among those interested in shipping in the Dominion, in order that any objections to the provisions may be made, and to give those objecting an opportunity of appearing before the committee to state their objections.

The Proposed Dry Dock at Sault Ste. Marie.

The bylaw which was passed recently by the ratepayers of Sault Ste. Marie, Ont., to subsidize the building of a dry dock there, provides for a bonus of $20,000 a year for 20 years, for a fixed assessment on the property for school taxes of $750,000 for 20 years, for exemption from general taxes for five years, and for a fixed assessment of $500,000 for general taxes for 15 years.

The agreement provides that work shall be commenced by Apr. 1, on the laying out and construction of the dry dock and shipbuilding plant, and the equipment is to be completed to the satisfaction of the Dominion Public Works Department so as to earn the annual Government susidy of 3% for 20 years on an expenditure of not less than $1,338,026.76, the whole to be completed and equipped ready for operation by Apr. 1, 1916.

The dry dock is to be built of concrete, and is to be not less than the following dimensions:—

Clear length inside gate sill	650 ft.
Clear width at gate sill	65 ft.
Width at coping level	90 ft.
Width in dock chamber at coping level	106 ft. 8 ins.
Width at sill level	93 ft. 4 ins.
Width at bottom	80 ft.
Depth on sill below ordinary low water level of St. Mary River	18 ft. 6 ins.

Payments of the corporation subsidy will be made annually on Nov. 1, the first of such payments being due on Nov. 1, 1916, provided the plant is completed and ready for operation at the time stated. The site for the plant comprises a water lot of about 5 5-10 acres.

The agreement with the city was made with F. H. Clergue, and the Lake Superior Dry Dock and Construction Co., Ltd., has been formed for the purpose of carrying on the work, the Ontario Legislature being asked to confirm the transfer of all rights under the agreement, to the company.

Steel vs. Wooden Hatch Covers. In connection with the vessel losses in the Great Lakes storm of Nov., 1913, it has been pointed out to Canadian Railway and Marine World, by a well known lake captain, that each of the vessels lost was equipped with steel hatch covers, and that none of the vessels equipped with wooden hatch covers, out in the storm, was lost. He has formed an opinion that the steel covers would be battered, or bulged in, during the storm, and the vessels flooded, but in the case of wooden hatch covers, they would not be so affected, owing to their general resiliency. Whether this be so or not, it is interesting to note that the St. Lawrence and Chicago Steam Navigation Co.'s new vessel, now being built at Collingwood, Ont., is having its hatch covers built of 4 in. spruce instead of steel.

Dominion Government Radiotelegraph Station.

The Department of Marine has issued a list of all the Government radiotelegraph stations on the Atlantic and Pacific coasts and the Great Lakes, which it has installed to date. All these stations work on a wave length of 600 metres. Charges on all messages to and from vessels are computed by the cable method of counting, with a minimum charge per message equal to a charge for 10 words. All Government messages, or those relating to weather conditions, and similar information covering the navigation of the vessel, are dealt with without charge. The various stations are located as follows:—

Atlantic Coast, the Gulf and River of St. Lawrence up to Montreal—Partridge Island, St. John, N.B.; Cape Sable, N.S.; *Camperdown, N.S.; *Sable Island, N.S.; *North Sydney, N.S.; Cape Race, Nfld.; Cape Ray, Nfld.; Grindstone Island, Magdalen Islands; Cape Bear, P.E.I.; *Pictou, N.S.; Belle Isle, Nfld.; Point Amour, Labrador; Point Rich, Nfld.; Harrington, Que.; Heath Point, Anticosti; Fame Point, Que.; Clarke City, Que.; Father Point, Que.; Grosse Ile, Que.; Quebec, Que.; Three Rivers, Que.; Montreal.

Great Lakes and Connecting Waters—Barriefield Common, Kingston, Ont.; Toronto; Port Burwell, Ont.; Point Edward, Ont.; Tobermory, Ont.; Midland, Ont.; Sault Ste. Marie, Ont.; Port Arthur, Ont.

Pacific Coast—Estevan, B.C.; Pachena, B.C.; Gonzales Hill, Victoria, B.C.; Point Grey, B.C.; Cape Lazo, B.C.; Alert Bay, B.C.; Triangle Island, B.C.; Ikeda Point, B.C.; Deadtree Point, B.C.; Parizeau Point, Prince Rupert, B.C.

The stations marked with an asterisk are owned and operated by the Marconi Wireless Telegraph Co. of Canada; all those on the Great Lakes and connecting waters are owned by the Government and operated by the company, and those on the Pacific coast are both owned and operated by the Government. The station at Kingston, Ont., which is being equipped will, it is expected, be put into operation on the reopening of navigation.

Telegraph, Telephone and Cable Matters.

The Newfoundland Legislature has authorized the issue of $140,000 of debtntures, to provide for the extension of the telegraph system in the colony.

The laying of one mile of cable between Welcome Pass and Thormandy Island, at Buccaneer Bay, B. C., was completed, Apr 9, and connection made with the land lines of the Dominion Government telegraph system.

The Great North Western Telegraph Co. has opened offices at Fonthill and Lyn, Ont., and has closed its offices at Bridgeport, Ont., and Phillipsburg, Que. The name of the office at Salmon Lake, Que., has been changed to Lac au Saumon.

The estimates recently passed in the House of Commons, cover work on telegraph lines in the various Provinces, as follows,—Cape Breton lines, N. S.; general improvements in P. E. I.; Bay of Fundy system, and betterment of service between Grand Manan, Campobello, N. B., and Eastport, Me.; improvements and extensions in Quebec; line from Athabaska Landing to Lac la Biche, Peace River line, and Qu'Appelle-Edmonton line, Sask. and Alta.; Clayoquot line, repoling Ashcroft-Quesnelle line, and general improvements on telegraph and telephone lines in B. C.; and Government telegraph lines generally.

In a recent lecture given at London, Eng., by Richard Kerr, the title of "Father of Wireless Telegraphy" was given to Jas. B. Lindsay, who was born in 1799 and died in 1862. This man, a not too prosperous schoolmaster at Dundee Jail, with a salary of £50 a year, made his own batteries and coils and sent wireless messages across the Tay and other Scottish rivers and lakes as well as across the Solent. He is said to have declared that if he only had the means to extend his experiments there was no reason why he could not send messages across the Atlantic. It was essential to the Lindsay system that there be a stretch of water between the transmitter and the receiver.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Canadian General Electric Co. has issued bulletin A4199 dealing with railway motor gears and pinions.

Hunt-Spiller Manufacturing Corporation, Boston, Mass., has appointed as its representative Elbert J. Fuller, who resigned a position on the Chicago and North Western Ry. to enter the Hunt-Spiller service.

Goldschmidt Thermit Co.—Reactions, the Goldschmidt Thermit quarterly publication, contains a number of descriptions of the various types of breakage for which thermit can be used with advantage, most of them being well illustrated. One of the repairs described is the welding of a broken rudder on the Dominion Coal Co.'s steam tug D. H. Thomas.

United States Light and Heating Co.—The Chicago branch sales office has been moved from 1013 People's Gas Building to 2335 State St. This change brings the Chicago sales office and service station into the same building. The railway department of the Chicago office is now under H. A. Matthews; R. E. Stuntz has charge of the battery and starter department, and the service department is being looked after by H. H. Emerson.

The Titanium Alloy Mfg. Co., Niagara Falls, N.Y., has issued Mail Reports, Bulletin 5, Open Hearth, containing extracts from a paper presented at the International Congress, for Testing Materials in 1912, by Robt. W. Hunt, giving analyses of segregated rails, a summary of chemical and physical results as reported in bulletins 1, 2, 3, 4 and 5, on standard open hearth A rails, and titanium treated open hearth A rails, a report by G. F. Comstock and a large number of illustrations of rail sections reproduced from photographs, with accompanying analyses, etc.

Hudson Bay Navigation.—The Minister of Marine announced in the House of Commons, recently, that the Lighthouse Board had decided to place 12 lights and 15 additional buoys between Hudson Bay Straits and Port Nelson, and that the Dominion Government s. s. Minto would leave as soon as possible to place them. He also stated that an amount in the naval service estimates would be devoted to the erection of a wireless telegraph station at some point along the straits.

Transportation Conventions in 1914.

May —.—Association of Railway Claim Agents, St. Paul, Minn.
May 5-8.—Air Brake Association, Detroit, Mich.
May 13.—Freight Claim Association, Galveston, Texas.
May 18-20.—Railway Storekeepers' Association, Washington, D.C.
May 18-22.—International Railway Fuel Association, Chicago, Ill.
May 19.—American Association of Demurrage Officers, St. Louis, Mo.
May 20-22.—Freight Claim Association, Galveston, Texas.
May 20-23.—Association of Railway Telegraph Superintendents, New Orleans, La.
May 21-22.—American Association of Railroad Superintendents, St. Louis, Mo.
May 26-29.—Master Boiler Makers' Association, Philadelphia, Pa.
May 28.—Association of American Railway Accounting Officers, Atlantic City, N.J.
June 10-12.—Master Car Builders' Association, Atlantic City, N.J.
June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 16.—Train Despatchers' Association of America, Jacksonville, Fla.
June 16-19.—American Society of Mechanical Engineers, St. Paul and Minneapolis, Minn.
June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.
June 30-July 4.—American Society for Testing Materials, Atlantic City, N.J.
July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.
Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.
Sept. 1-4.—American Boiler Manufacturers' Association, New York.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Reading, Mass.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

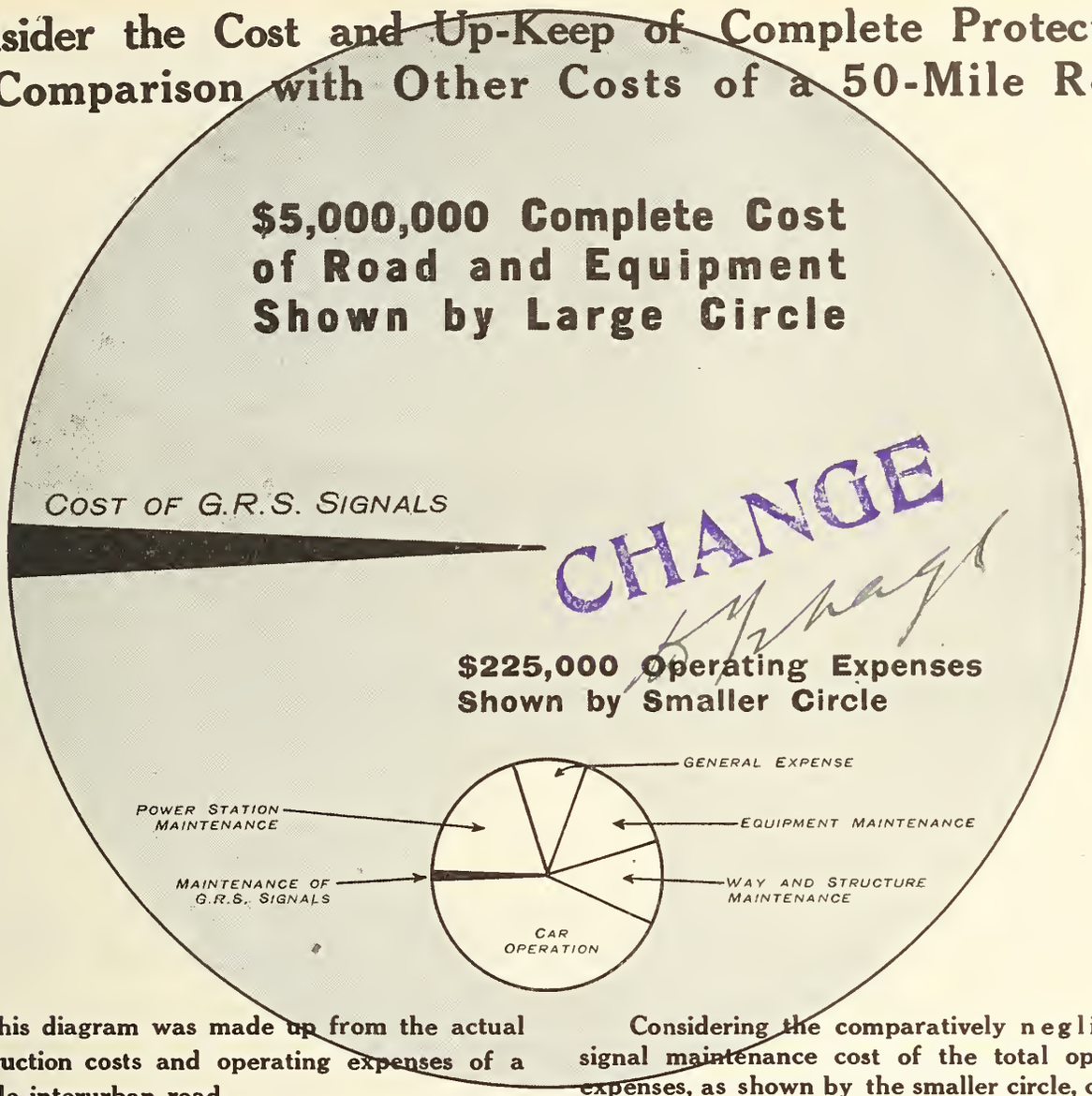
Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly (acting), 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolstey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, J. S. Blanchet, Quebec.
Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

R. R. Neild, General Superintendent, Manitoba Bridge & Iron Works, read a paper before the Western Canada Railway Club in Winnipeg, April 6, on the manufacture of iron and steel.

Consider the Cost and Up-Keep of Complete Protection in Comparison with Other Costs of a 50-Mile Road



This diagram was made up from the actual construction costs and operating expenses of a 50-mile interurban road.

The purpose of showing it is to illustrate stronger than words just how LITTLE it costs to provide COMPLETE safety.

—to increase track capacity.

—to improve schedules.

—to protect the investment against sudden depreciation.

—to secure what is conceded to be the very best advertisement for traffic promotion.

Considering the comparatively negligible signal maintenance cost of the total operating expenses, as shown by the smaller circle, can you afford to accept anything less than complete protection?

Continuous Track Circuit Signaling is the simplest system that can be depended upon for correct signal indications under all conceivable conditions.

IT IS COMPLETE PROTECTION.

Without cost or obligation on your part we will outline a plan showing just what investment is necessary to secure for your road the only protection you can afford to install.

Each day's delay means a loss to your road.

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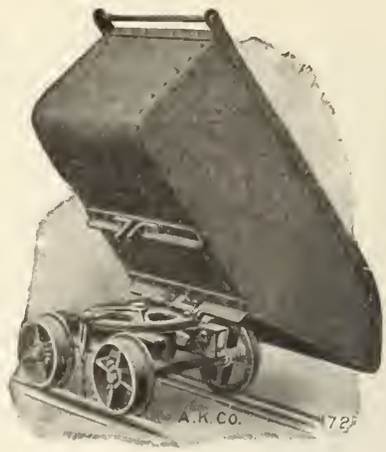
LACHINE, QUEBEC

Scoop All Around Dump Car



This car is especially designed for mines and for the conveyance of wet materials, such as concrete, mortar, wet sand, ashes, etc.

It is built without doors, and the discharging end is fashioned into the form of a scoop, which is an excellent construction for placing the load where it is desired, as the body is built on a swivel turntable.

This type of car is built for 12 to 18 cubic feet capacities and for 18, 20 and 24-inch gauges.

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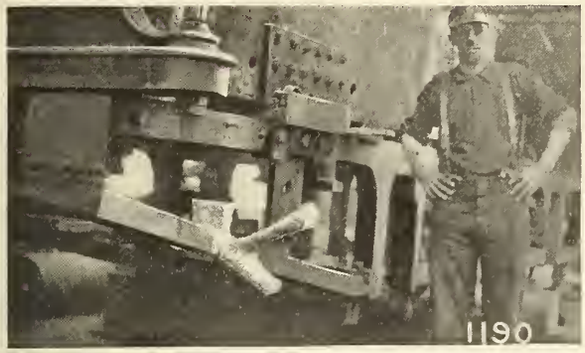

Finished Thermit Weld on Engine No. 802 of the Grand Trunk Pacific, Transcona, Man.

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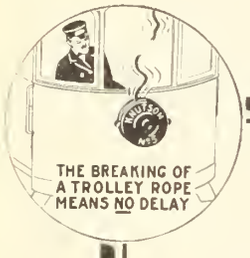

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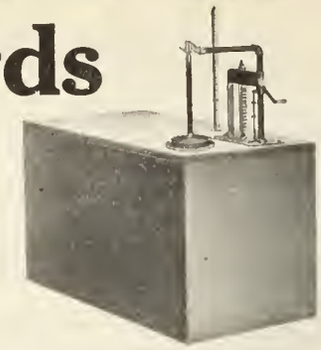

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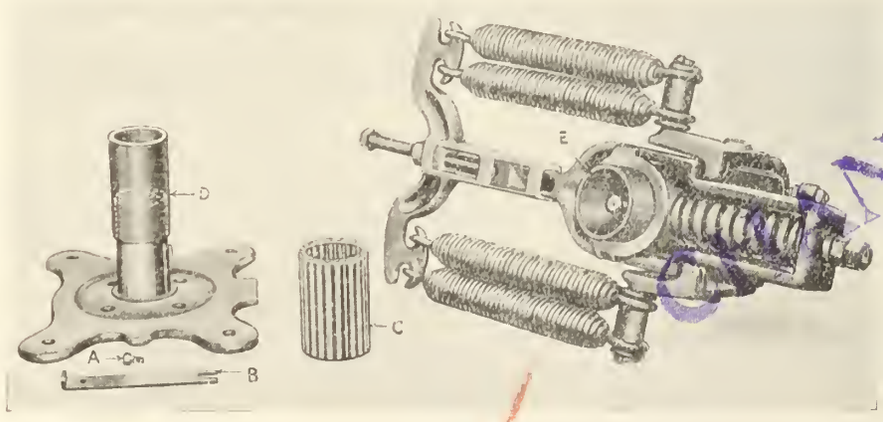

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DESIGNED ESPECIALLY to handle pipes spaced closely as in coil work. No. 2½ wrench illustrated requires but three-quarter inch space between pipes.

POSITIVE GRIP instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

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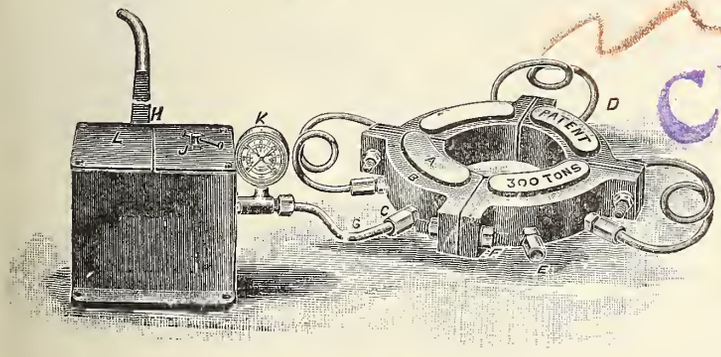
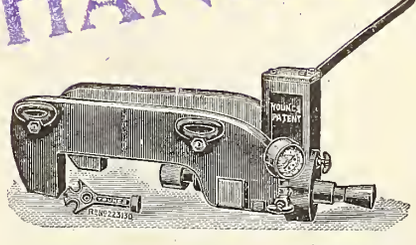
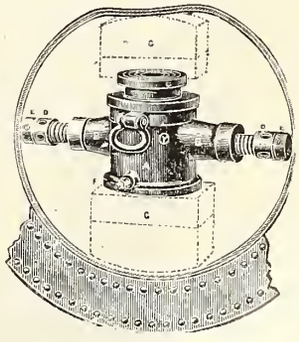


PROPELLER STARTER.



BOLT FORCER.



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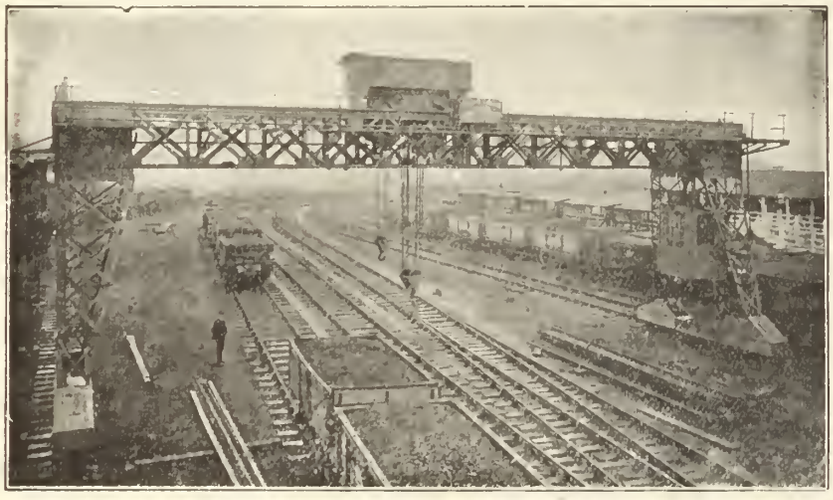

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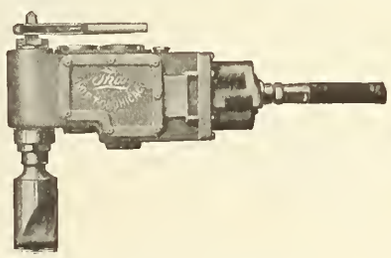

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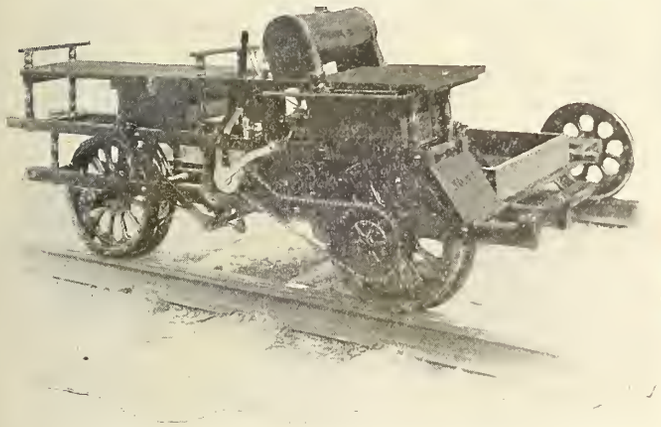

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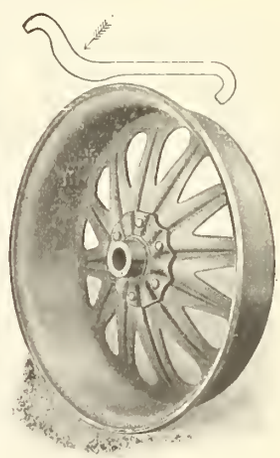

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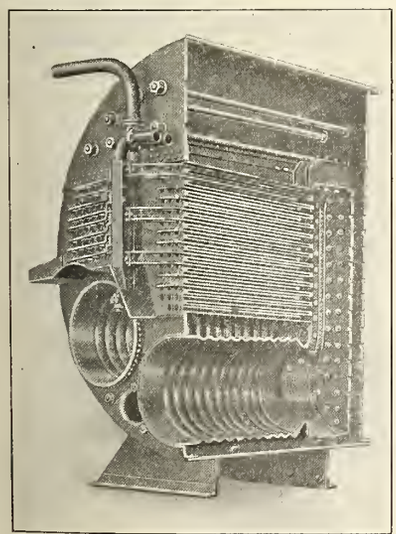

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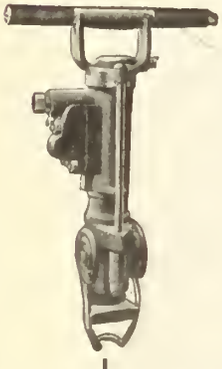

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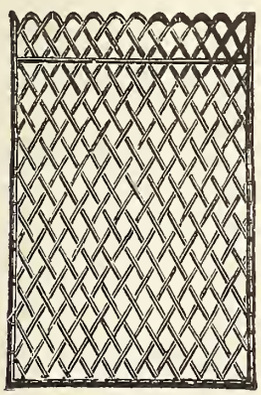

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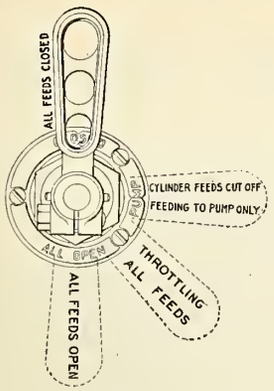

The Oil Control Valve insures economy

This one valve enables the engineer to start, stop or throttle all feeds instantly without even touching the various feed regulating valves.

A half turn stops all feeds, a quarter turn cuts off the cylinder feeds and leaves working only the feeds to the air pump and other parts requiring continuous lubrication. Moving the handle away from the "All Open" position throttles all the feeds.

The old way required the frequent manipulation of each feed valve—opening, closing and adjusting every time the feeds were stopped or throttled. The length of time required made it impractical to expect the operator to go to all this trouble during short stops, and also when less oil was required.

The Oil Control Valve on Detroit Bullseye Locomotive Lubricators makes it easy to save oil. The ease with which the handle can be operated encourages economy.

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The average weight of 100 shoes taken at random from this pile was about 5½ lbs.

The roads using these shoes received about twice as much brake shoe service as could have been gotten from ordinary unreinforced shoes. It paid them and it will pay your road to use Steel Back Brake Shoes.

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For quickly dressing or smoothing up work from which little stock is to be removed you cannot beat the disc machine—but it will turn out more work better and more uniform work if it is equipped with

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The Disc that Really Cuts

In a Connecticut plant, for instance, an operator finishes the six sides of 200 pounds of one-inch malleable iron nuts in a day with these discs. —Carborundum discs are made in any size—any grit, they are uniformly coated with clean, sharp, fast-cutting Carborundum grain—they show long life and the grain stays on.

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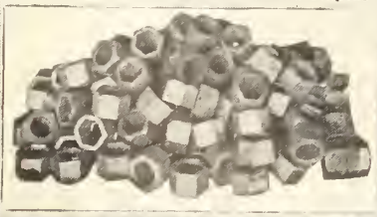
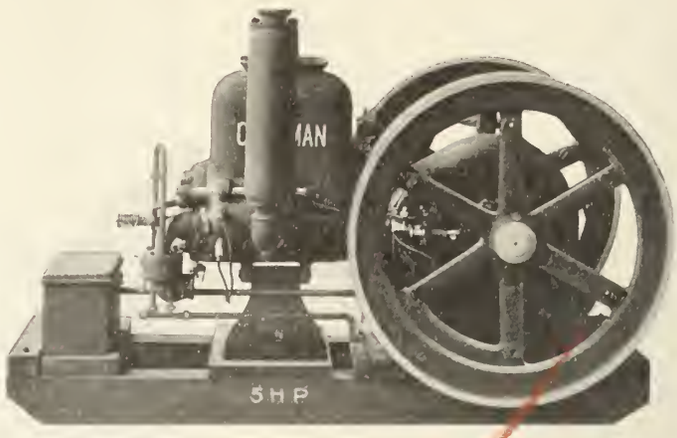


Chapman Gasoline Engines

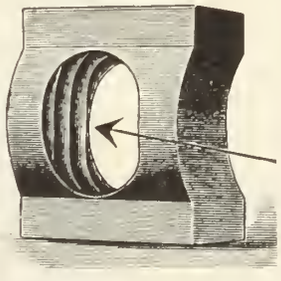


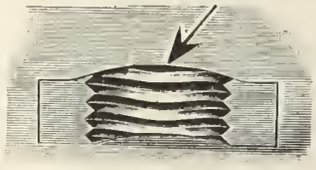
The Chapman gasoline engine is the last word in power development for operating pumps on contract work or railway station water tanks. The mechanical control cam is enclosed in a solidly constructed box, which can be removed and sent in to nearest branch, ensuring quick repairs. Write for catalogue.

Ontario Wind Engine & Pump Co., Ltd.

MONTREAL TORONTO WINNIPEG CALGARY

20th Century Nut
The Grip Nut





This cut shows an exaggerated curve in pitch thread—or more than is given in practice, in order to emphasize this feature.

The vise-like grip obtained on the threads of bolts by the application of Grip Nuts secures a result different from that of any other locking device, for the reason that it resists equally in both directions, and is entirely independent of anything but the bolt for its locking action. The Grip Nut does not injure the threads of the bolt, and can be applied and re-applied.

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Canada Grip Nut Company, Limited

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Works: St. Johns, Que.

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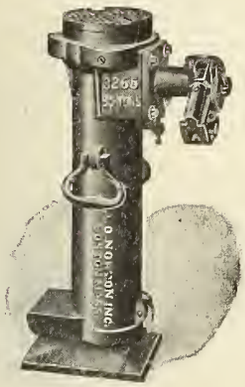
HIGH SPEED JACKS



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AND ITS LESSON

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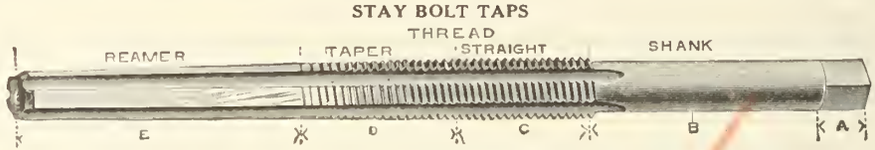

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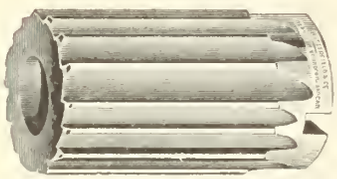

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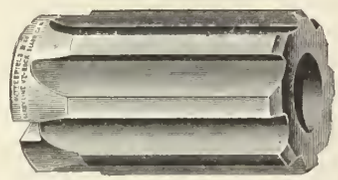

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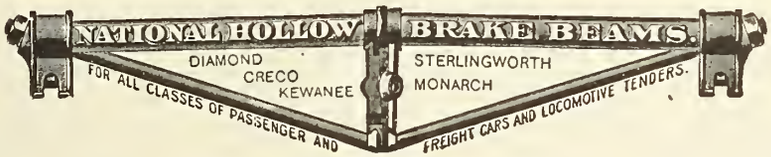

New Canadian Office and Works :

1835-D Ontario St. East, cor. Moreau, Montreal, Que.

Station Signs that Command Attenion

AGENT

Enameled iron signs for station names and doors are ideal.

They always command attention and look bright and attractive. They never fade and will last a life time.

They Save Money.
Write for Prices.

Acton Burrows
Limited

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For Roundhouses and Shop Buildings

Highest Efficiency on Least Possible Fuel Consumption.

F. W. MILLER HEATING CO.
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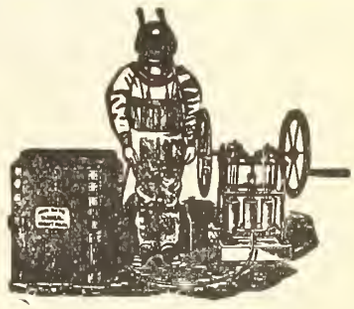

JOHN DATE
Manufacturer of
Diving Apparatus
For Sale or Hire
Brass Founder and Coppersmith
13-15 Concord St., Montreal

Special
Old Style
German Brau
THE DARK MELLOW BEER

It Pleases Everybody

E. L. Drewry, Limited
Winnipeg

FOR SALE

30 Standard Gauge Flat Cars in good condition, will pass M. C. B. inspection, 30 ton capacity, equipped with air brakes.

John J. Gartshore
Toronto

The Pratt and Letchworth Co., Limited
Brantford, Ont.
MISCELLANEOUS MALLEABLE CASTINGS AND RAILWAY SPECIALTIES
NON-CORROSIVE MALLEABLE TIE PLATES AND RAIL BRACES

TRADE MARK ASBESTOSLATE ASBESTOS SHINGLES
ASBESTOS MANUFACTURING COMPANY, Limited
E. T. BANK BLDG., 263 ST. JAMES ST., MONTREAL
FACTORY AT LACHINE, P. Q. (Near Montreal)
THE ASBESTOS MANUFACTURING CO LIMITED MAKERS OF THE BEST IN ASBESTOS

RAILWAY EXCHANGE — CHICAGO
FERGUSON SHOP FURNACES
MANUFACTURED IN CANADA
THE RAILWAY MATERIALS CO.
SINGER BUILDING — NEW YORK

The Grand Trunk Railway Company of Canada.

NOTICE is hereby given that the Ordinary General Half-yearly Meeting of the Grand Trunk Railway Company of Canada will be held at the Cannon Street Hotel, Cannon Street, London, E.C., on Wednesday, the 29th April, 1914, at twelve o'clock noon precisely, for the purpose of receiving a Report from the Directors, for the election of Directors and Auditors, and for the transaction of other business of the Company.

Notice is also given that resolutions will be submitted to the meeting to assent to and accept two Acts of Parliament of Canada, entitled respectively "The Grand Trunk Act, 1914," and "The Grand Trunk and Canada Atlantic Amalgamation Act, 1914," and to authorize the Directors to exercise powers conferred by the said respective Acts.

Notice is also given, that the Transfer Books of the Company in London and Montreal, except so far as regards the transfer books of the Perpetual Four per cent. Consolidated Debenture Stock, will be closed from Saturday, the 4th day of April, to the day of meeting, both days inclusive.

By order,
ALFRED W. SMITHERS, Chairman.
H. H. NORMAN, Secretary.

Dashwood House, 9 Broad Street,
London, E.C., 27th March, 1914.

Electric Heaters
Switches
Relays
Buzzers
Door Operators
Door Signals
Stateroom Heaters
Steam Couplers
Steam Traps
Valves
Pipe Fittings
CONSOLIDATED CAR-HEATING CO.
Albany New York
Chicago Coaticooke, P.Q.

POOLE BROS CHICAGO RAILWAYS
PRODUCERS OF PUBLICITY PRINTING
FOR TRANSPORTATION COMPANIES
Finest Quality of Work Reasonable Prices
Prompt and Efficient Service
MAPS OF ALL KINDS SPECIALLY ENGRAVED
ILLUSTRATED FOLDERS AND BOOKLETS
ALL FORMS OF TICKETS
Write us about your next work
POOLE BROS. 81-89 W. HARRISON ST. CHICAGO

Ontario Jockey Club
Toronto
Spring Meeting
May 23rd to May 30th
THE KING'S PLATE
The oldest fixture run continuously on this continent, will be run on
Saturday, May 23rd
General Admission $1.50
JOS. E. SEAGRAM, President
W. P. FRASER, Sec'y-Treas.

Car Closets
FLUSH OR DRY
DUNER CO. 101 S. CLINTON ST. CHICAGO

CRANES AND HOISTS

NORTHERN CRANE WORKS, Limited
Walkerville, Ontario

Department of Railways and Canals, Canada.

Hudson Bay Railway Terminals.
PORT NELSON, MAN.

SEALED TENDERS, endorsed "Tender for Provisions" or "Tender for Hardware Supplies," as the case may be, will be received by the undersigned, up to 16 o'clock Tuesday, May 5th, 1914, for the furnishing of the above, to be delivered in such quantities at Halifax, N.S., and at such times as may be directed.

Dealers may tender for the total quantities required, or for such portions thereof, as may suit their convenience.

Specifications of requirements and full information can be obtained from the Purchasing Agent of the Department of Railways and Canals, Ottawa, on and after this date.

Accepted bank cheques for $1,000.00 and $500.00 respectively, made payable to the order of the Minister of Railways and Canals, must accompany each tender, which sums will be forfeited if the party tendering declines entering into contract for supplying any of the goods awarded to him, or in any way fails to properly fulfill the same.

The cheque thus sent in will be returned to the respective tenderers whose tenders are not accepted.

The lowest or any tender not necessarily accepted.

By order,
L. K. JONES,
Asst. Deputy Minister and Secretary.

Department of Railways and Canals,
Ottawa, April 20th, 1914.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—59816.

POLES, PILING and TIES
Idaho and British Columbia
Cedar, Fir and Tamarack
MacKinnon Lumber Co., Ltd., Calgary

Ventilation-Sanitation-Economy-Safety
All Combined in
THE COOPER FORCED VENTILATION HOT AIR HEATER
(PATENTED)
Ask for the full story.
We Also Manufacture Pressed Steel Hot Water Heaters
THE COOPER HEATER CO., CARLISLE, PA.

Meteor Metal

An absolute substitute for

Platinum

for

Spark and Contact Points

in Gas and Gasoline Engines and Automobiles

Telephones, Bells and Electrical Devices

Is Non-corrosive, Non-expanding, Non-oxidizing

Supplied in

Rods, Sheets, Tapes

Write for Particulars.

Hermann Boker & Co.
332 St. James St., Montreal

JAMES THOMSON, Pres. and Mang. Director. J. G. ALLAN, Vice-President. JAMES A. THOMSON, Secretary

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
LIMITED

MANUFACTURERS OF

3 inches to 60 inches diameter
FLEXIBLE AND FLANGE PIPE AND SPECIAL CASTINGS
FOR WATER, GAS, CULVERT AND SEWER
HAMILTON, ONT.

Iron Steel or Bronze Any Size or Purpose

PROPELLER WHEELS

THE WM. KENNEDY & SONS, Limited
OWEN SOUND, ONT.

Solid or Sectional = Large Stock

STEEL, PEECH & TOZER
Limited

SHEFFIELD, ENGLAND

STEEL AXLES, TYRES, AND SPRING STEEL

"PHOENIX" Loco. Spring Steel is the accepted Standard in Canada.

Sole Agents:
James Hutton & Co., Montreal

Our motto is "THE ANCHOR HOLDS" Because

ANCHOR PACKING holds tight to high quality.
High quality holds tight on the job, and gives results.
Results hold our customers.
Customers hold to Anchor Packings.

The Anchor Packing Co., Ltd. **Canuck Supply Co., Ltd.**
Montreal - Toronto - Winnipeg

IMPERIAL BANK OF CANADA

Established 1875
Capital Authorized $10,000,000
Capital Paid-up 6,925,000
Reserve and Undivided Profits 8,100,000
Head Office: Toronto.

Letters of Credit, Travellers' Cheques and Drafts issued, available in all parts of the world.

Sterling and New York Exchange bought and sold.

Savings Department: Interest allowed on deposits at best current rates.

Branches throughout the Dominion of Canada.

HEADLIGHTS - We Make Them

for OIL for Pyle ELECTRIC equipment or SPECIAL to Blue Print, and carry a large stock of standard headlight reflectors, burners, burner parts, felt wicks and chimneys.

The HIRAM L. PIPER CO., Limited

75-77-79 and 81 St. Remi Street, Montreal

Railway Catalogue No. 30, Marine Catalogue No. 21. Mailed on Request.

J. S. COFFIN, President SAMUEL G. ALLEN, 1st Vice-President W. H. COYLE, 2nd Vice-President C. L. WINEY, Sec. & Treas.

FRANKLIN RAILWAY SUPPLY COMPANY

Specialists in Devices that Make for Economy

Chicago Office: 332 S. Michigan Avenue
Main Office: 30 Church Street, New York
San Francisco Office: 795 Monadnock Bldg.

Protect Your Derrick Or Other Wire Rope Installation With Genuine "CROSBY" Clips

They are made on scientific principles to produce greatest gripping power; drop forged from steel bars; galvanized.

The safety of your workmen, your equipment and your contract depend on the reliability of your wire rope fastenings. Use nothing but "Crosby" Clips and play safe. They cannot slip, break nor rust.

AMERICAN HOIST & DERRICK CO., ST. PAUL, MINN., U.S.A.

Chicago, New York | Pittsburgh, New Orleans | San Francisco, Los Angeles | Seattle, Portland | Spokane, Denver | Winnipeg, Edmonton | Vancouver, Calgary

AMERICAN WELL WORKS, Aurora, Ill., U.S.A.

Irrigation Pumps — Municipal Pumps — Deep Well Pumps

MONTREAL — WINNIPEG — CALGARY — EDMONTON

THE CANADIAN BRIDGE CO., Limited

WALKERVILLE, ONTARIO

LOCOMOTIVE TURNTABLES ROOFS STEEL BUILDINGS

Manufacturers of

Railway and Highway

BRIDGES

STRUCTURAL IRON WORK OF ALL DESCRIPTIONS

Save 50% on the Job

One prominent railroad writes that Western Air Dump Cars saved them 50% on handling material. That's quite an item and should interest you. All over the country contractors are saving from 25 to 50% of their earth handling expense by using

Western Air-Dump Cars

They are time and labor savers. Unequalled for grading and trestle filling. Dump clear of track and can be "pulled out" immediately.

Write for illustrated catalogue.

WESTERN WHEELED SCRAPER CO.

Earth and Stone Handling Machinery

AURORA, ILLINOIS

James T. Gardner

RAILWAY EQUIPMENT

615 Railway Exchange

CHICAGO, ILL.

Has on hand at all times

First - Class Freight and Passenger Locomotives

Also

Contractors' Locomotives Cars, Rails, Etc.

Specifications with Prices on Application

CHICAGO CAR HEATING CO.

GENERAL OFFICES: RAILWAY EXCHANGE, CHICAGO, U.S.A.

VAPOR SYSTEM AND STEAM HEAT SPECIALTIES.

CANADIAN FACTORY AND OFFICE—61 DALHOUSIE ST., MONTREAL *A. D. BRUCE, Agent*

The Purchasing Agents' Guide

To the Manufacturers of and Dealers in Steam and Electric Railway, Railway and Canal Contractors', Marine, Express and Telegraph Supplies.

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Carborundum Co.
ACETYLENE
Commercial Acetylene Co.
ACETYLENE APPARATUS
L'Air Liquide Societe.
AERATED WATERS
E. L. Drewry.
AIR BRAKES AND FITTINGS
Canadian Allis-Chalmers, Ltd.
Canadian Westinghouse Co.
ALES
E. L. Drewry.
ALLOYS
Titanium Alloy Mfg. Co.
ANCHORS, GUY
Crouse Hinds Co. of Canada.
ANCHOR RODS
Crouse Hinds Co. of Canada.
ANGLE BARS
Steel Co. of Canada, Ltd.
ANTI RAIL CREEPERS
The Holden Co., Ltd.
ASBESTOS
Asbestos Manufacturing Co.
Can. H. W. Johns-Manville Co.
AUTOMOBILES
Preston Car & Coach Co.
AXES
Canadian General Electric Co.
AXLES
Canadian Car & Foundry Co.
James Hutton & Co.
Nova Scotia Steel and Coal Co.
Jas. W. Pyke & Co.
Steel Co. of Canada, Ltd.
BATTERIES, PRIMARY
Thomas A. Edison, Inc.
BATTERIES, STORAGE
Canadian Fairbanks-Morse Co.
Canadian General Electric Co.
Edison Storage Battery Co.
BEACONS
Safety Car Htg. & Ltg. Co.
BEARINGS, SIDE
Canadian Car & Foundry Co.
Chicago Railway Equipment Co.
BOILER COMPOUND
Bird-Archer Co.
Dearborn Chemical Co. of Canada.
BOILERS
Babcock and Wilcox, Ltd.
F. H. Hopkins & Co.
Polson Iron Works, Ltd.
BOILERS, PORTABLE
Babcock & Wilcox, Ltd.
F. H. Hopkins & Co.
Polson Iron Works, Ltd.
BOILERS, STATIONARY AND MARINE
Babcock & Wilcox, Ltd.
Canadian Allis-Chalmers, Ltd.
Polson Iron Works, Ltd.
BOILERS, STEAM
Babcock & Wilcox, Ltd.
F. H. Hopkins & Co.
Polson Iron Works, Ltd.
BOILERS, WATER TUBE
Babcock & Wilcox, Ltd.
Canadian Allis-Chalmers, Ltd.
Polson Iron Works, Ltd.
BOILER WASHING SYSTEMS
F. W. Miller Heating Co.
BOLSTERS
Canadian Car & Foundry Co.
BOLTS AND NUTS
Steel Co. of Canada
BOLTS, TRACK
F. H. Hopkins & Co.
Nova Scotia Steel & Coal Co.
Steel Co. of Canada, Ltd.
BORERS, CAR WHEEL
John Bertram & Sons Co.
Canada Machinery Corporation.
BRAKE BEAMS
Buffalo Brake Beam Co.
Canadian Car & Foundry Co.
Chicago Railway Equipment Co.
BRAKE SHOES
American Brake Shoe & Foundry Co.
Canadian Brakeshoe Co., Ltd.
The Holden Co., Ltd.
Whyte Railway Signal Co.
BRASS AND COPPER CLOTH
B. Greening Wire Co., Ltd.
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Acton Burrows, Limited.
BRIDGES
Canadian Allis-Chalmers, Ltd.
Canadian Bridge Co.
Dominion Bridge Co.
BRONZE
Titanium Alloy Mfg. Co.
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M. Beatty & Sons, Ltd.
Brown Hoisting Machinery Co.
F. H. Hopkins & Co.
BUILDINGS, STEEL
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Canadian Bridge Co.
Dominion Bridge Co.
BUMPING POSTS
The Holden Co., Ltd.
F. H. Hopkins & Co.
McCord & Co.
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Canada Wire & Cable Co., Ltd.
E. F. Phillips Electrical Works.
Northern Electric Co.
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F. H. Hopkins & Co.
Mussens, Ltd.
CAR ROOFING
Franklin Railway Supply Co.
F. H. Hopkins & Co.
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Crossen Car Co.
Canadian Car & Foundry Co.
J. T. Gardner.
Hart-Otis Car Co., Ltd.
National Steel Car Co.
Nova Scotia Car Works, Ltd.
Preston Car & Coach Co., Ltd.
Ross & McDonald.
Tillsonburg Electric Car Co.
Western Wheeled Scraper Co.
CAR SIGNALS SYSTEMS
Ohio Brass Co.
CASTINGS
Canadian Car & Foundry Co.
Crossen Car Co.
Titanium Alloy Mfg. Co.
CASTINGS, BRASS
Canadian Bronze Co.
CASTINGS, CAR
American Brake Shoe & Fdry Co.
CASTINGS, IRON
Canadian Allis-Chalmers, Ltd.
Hunt-Spiller Manufacturing Corp.
CASTINGS, IRON AND STEEL
American Brake Shoe & Fdry. Co.
Dominion Steel Foundry Co.
CASTINGS, MALLEABLE
Canadian Malleable Iron Co.
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CASTINGS, STEEL
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CATENARY MATERIALS
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B. J. Coghlin Co.
F. H. Hopkins & Co.
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Duner Co.
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Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co.
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F. H. Hopkins & Co.
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Crouse Hinds Co. of Canada.
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Mechanical Engineering Co.
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The Holden Co., Ltd.
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Carborundum Co.
DIES
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John Date.
F. H. Hopkins & Co.
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Mussens, Ltd.
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The Holden Co., Ltd.
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Standard Coupler Co.
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F. H. Hopkins & Co.
Polson Iron Works, Ltd.
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Canadian Ingersoll-Rand Co.
Independent Pneumatic Tool Co.
DRILLS, RADIAL
Canada Machinery Corporation.
Mussens, Ltd.
DRILLS, VERTICAL
Canada Machinery Corporation.
DRILLS, WELL
Ontario Wind Engine & Pump Co.
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Canadian Fairbanks-Morse Co.
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DYNAMOS
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Mechanical Engineering Co.
ENGINES, GASOLENE
Canadian Allis-Chalmers, Ltd.
Canadian Fairbanks-Morse Co.
Ontario Wind Engine & Pump Co.
ENGINES, HOISTING
Canadian Allis-Chalmers, Ltd.
M. Beatty & Sons.
Canadian Fairbanks-Morse Co.
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Polson Iron Works, Ltd.
ENGINES, STATIONARY AND MARINE
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Coleman Fare Box Co.
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Railway Materials Co.
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McCord & Co.
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GAUGES, WATER
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GEARS
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Carborundum Co.
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Canada Grip Nut Co.
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American Brake Shoe & Fdry. Co.
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Crossen Car Co.
F. H. Hopkins & Co.
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Rice Lewis & Son.
HANGERS, CABLE
St. Und. Cable Co. of Can., Ltd.
HARDWARE
Rice Lewis & Son.
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Safety Car Htg. & Ltg. Co.
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Chicago Car Heating Co.
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F. W. Miller Heating Co.

Leading Hotels in Leading Cities.

HOTEL LENOX, BUFFALO, N. Y.

Most beautiful location for a city hotel in America. Away from the dust and noise. Modern and fireproof. European Plan. Write for complete rates, also complimentary "Guide of Buffalo and Niagara Falls."

C. A. MINER, Manager.

THE HOLLENDEN
CLEVELAND
European Plan Rates With Bath
$2.00 to $5.00

Royal Military College of Canada

Entrance Examination, 1914.

IT is notified for the information of all concerned that Squad and Company Drill (practical) is added to the list of voluntary subjects for the Entrance Examination to the Royal Military College, 1914. Marks will be awarded as follows:—

	Maximum.	Minimum.
Squad Drill	100	50
Company Drill	100	50

The authorized text Book for this subject is "Infantry Training, 1911," Part II and Sections 1 and 2 of Part III. This book can be obtained from Officers Commanding Divisions and Districts, price 25 cents.

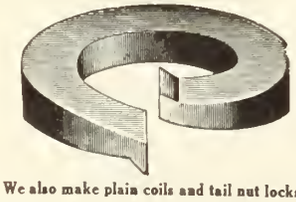
V. A. S. WILLIAMS, Colonel,
Adjutant General.

Department of Militia and Defence,
Ottawa, March 9, 1914.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.

(H.Q. 74-63-1.—57401.)

The Positive Lock Washer
is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks
The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.
F. H. HOPKINS & CO., Agents, Montreal.

The Ottawa Car Manufacturing Co., Limited
Builders of
Electric Cars, Fine Carriages, Wagons, Sleighs, Etc.
Office and Works:
SLATER ST. - OTTAWA

Birks Building, Vancouver, B.C.
Architects:
Somervell & Putnam, Vancouver, B.C.
El. Contractors:
NePage, McKenny Co., Seattle, Wash.

"Quality and Safety First"
should be your motto when buying rubber insulated wire for interior wiring. The wire which has behind it years of successful service and is endorsed by discriminating buyers is a safe wire for you to buy.

"STERLING"
Rubber Insulated Wire
is a high grade N.E.C. wire, guaranteed by many years of successful service. It is specified and used by architects, engineers and contractors of many high grade buildings, one of which is shown below.

Write our nearest office for information about "Sterling" before buying.

Standard Underground Cable Co. of Canada, Limited
Hamilton, Ont.
Montreal, Que. Winnipeg, Man.
Boston, Mass. Seattle, Wash.

Quality Not Quantity

Is the reason why we make our Replacers out of the BEST STEEL PLATE instead of cast metal. The distance from caboose to head end of train is getting longer, and when a man carries a pair of our Replacers that distance he is not all used up, but ready to rerail his car or locomotive.

The pair this man is carrying is our Standard No. 1, made of 9-16 plate, weight 164 lbs. per pair, and guaranteed to carry 200 tons.

We make smaller sizes, No. 3 for Mine Work, Electric Motors, Mine Engines and Rope Haulage; weight 58 lbs. per pair.

Do not fool yourself. If you want efficiency and quick service give your men a tool they can handle, that will do the work and that pleases them.

SEND FOR CIRCULAR SHOWING USERS. 70,000 PAIR IN SERVICE.

The Alexander Car Replacer Manufacturing Co.
SCRANTON, PA.

ROBERT W. HUNT, President. JAS. W. MOFFAT, Secretary.
THOS. C. IRVING, JR., Vice-President. C. C. WHITTIER, Treasurer & Manager.

ROBERT W. HUNT & CO., LIMITED
BUREAU OF INSPECTION TESTS AND CONSULTATION

Expert examination and tests of material. Inspection of Steel Rails and Fastenings, Cars, Locomotives, Bridges, Structural Material, Cast Iron Pipe, etc. Resident inspectors located at all important manufacturing centres.

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McGill Building, - - - - - MONTREAL, QUE.
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415 Bank of Ottawa Building, Vancouver, B.C.
Norfolk House, Laurence Pountney Hill, London, E.C.
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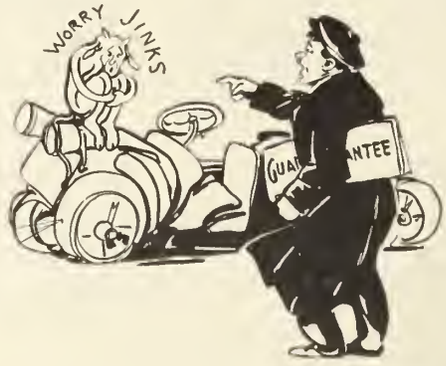

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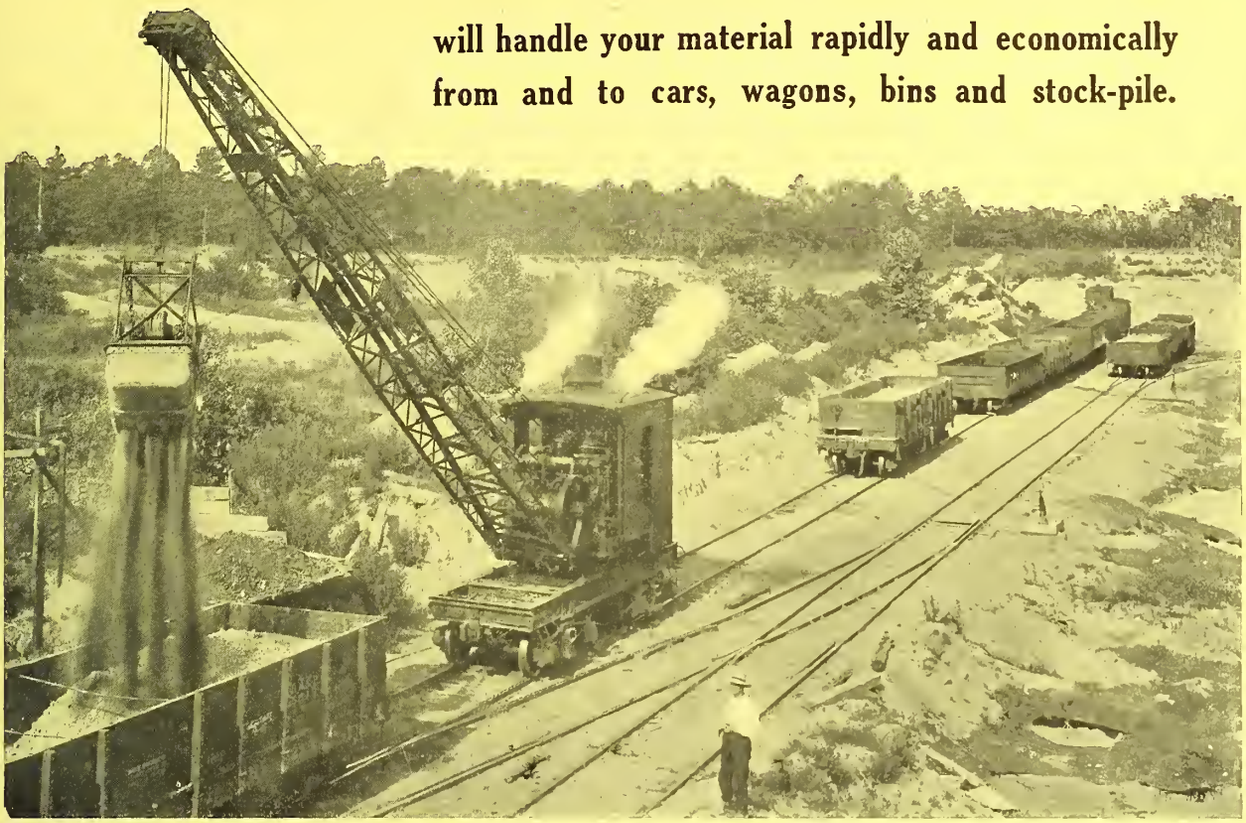
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

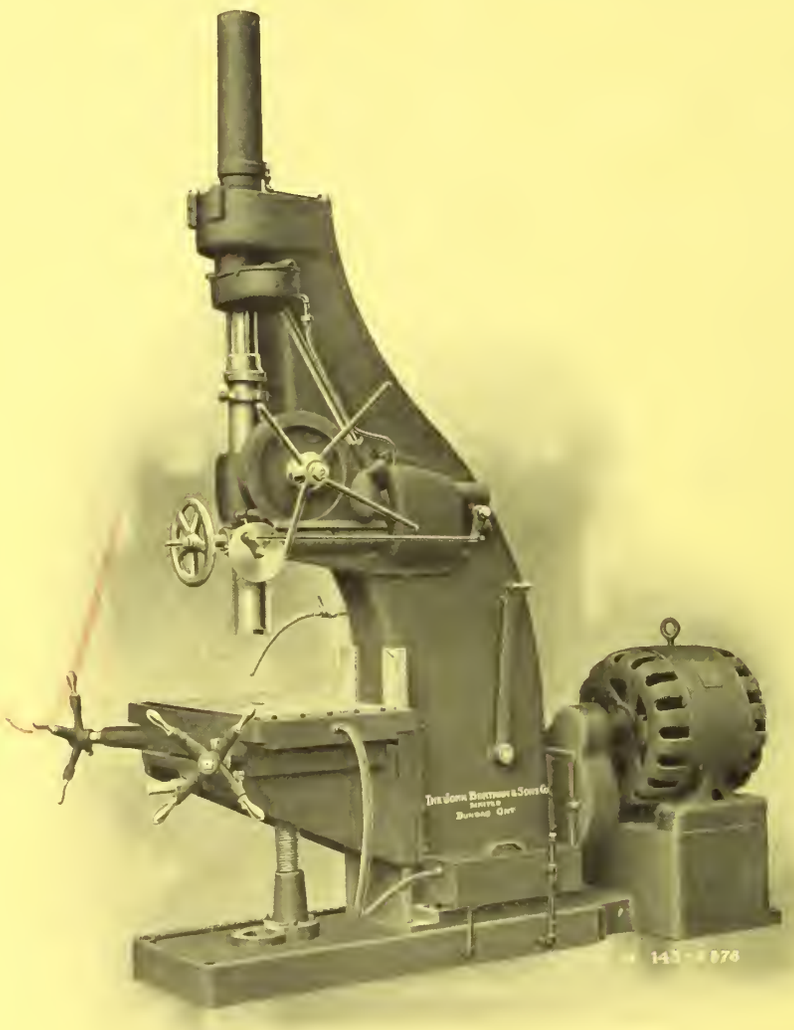
And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO, U.S.A.

Bertram High Speed Drills



36-Inch Heavy Duty Vertical Drilling Machine—Motor Driven.

Capacity up to 3½-inch hole in steel.
Photographs and specifications sent on request.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

Agents: The Canadian Fairbanks-Morse Company, Limited

Offices: MONTREAL, TORONTO, WINNIPEG, VANCOUVER, CALGARY, SASKATOON, ST. JOHN.

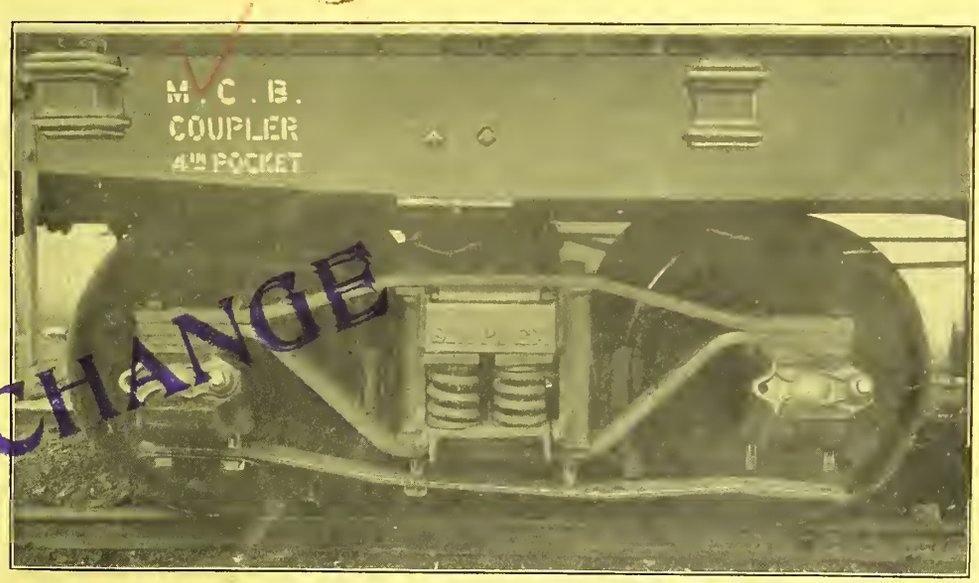
Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 196 — TORONTO, CANADA, JUNE, 1914 — Subscription Rates Page 269

A Truth and a Fact

Trucks never come in that way
once they've been Grip Nutted



CHANGE

Write for Particulars To-day

Canada Grip Nut Co., Limited

Head Office:
263 St. James St.,
Montreal, Que.

Works:
St. Johns,
Que.

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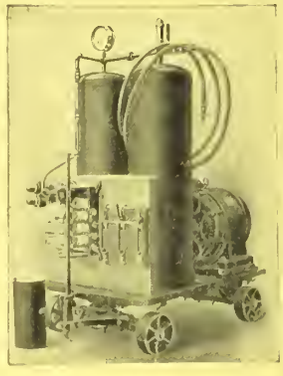
Westinghouse Portable, Motor-Driven Air Compressor Outfits



THESE outfits are being used with great success in power houses, railroad yards, car barns, etc., for cleaning machinery, cleaning cars and for other purposes.

Their compactness allows them to be taken through narrow spaces, their simplicity makes them easy to operate.

They are built in four standard sizes, with capacities of 14 1-2, 25, 37 1-2 and 50 cubic feet of free air per minute.

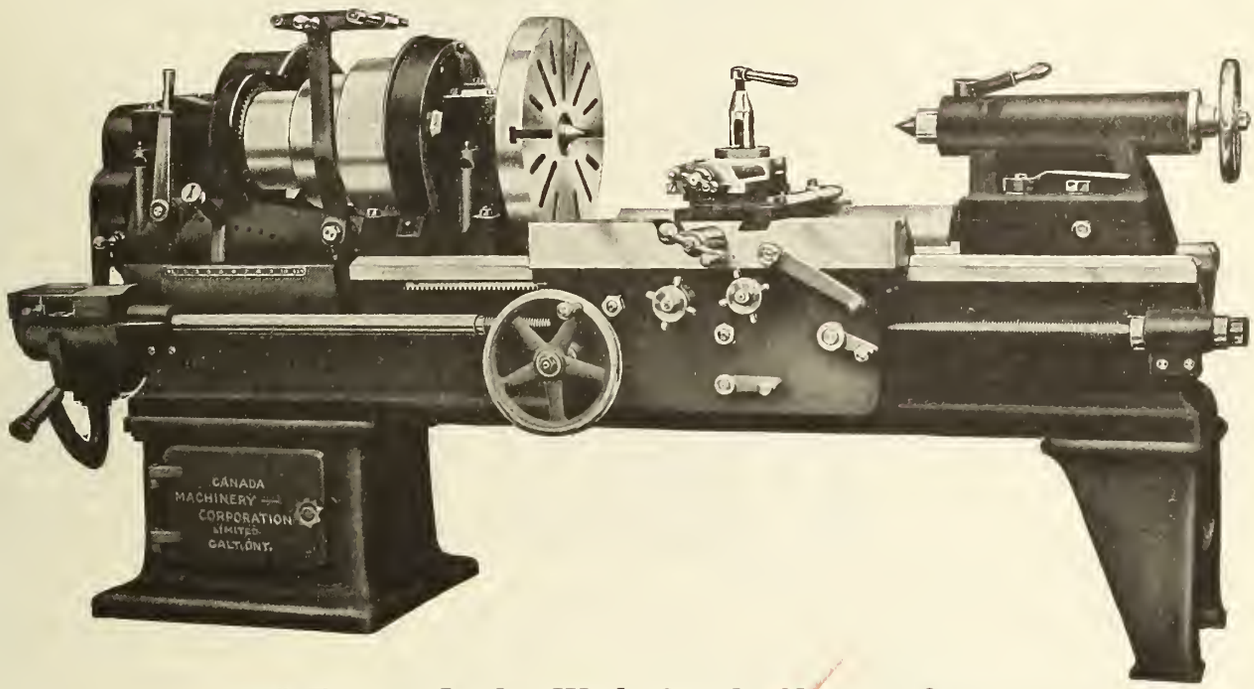
Our nearest office will tell you all about them.

Canadian Westinghouse Co., Ltd., Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX
Traders Bank Building	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.

WINNIPEG	CALGARY	VANCOUVER
152 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

LATHES C.M.C. LATHES



20" Engine Lathe With Quick Change Gears.

A SAFETY BELT SHIFTER IS PART OF THE STANDARD EQUIPMENT OF ALL OUR LATHES.

The practice of shifting lathe belts from step to step of the cone by hand is dangerous, and in the present time of "SAFETY FIRST" movement this practice should receive attention.

A point to be considered.

By the use of our improved belt shifting device the operator can easily and quickly shift the belt without endangering himself.

The head stock of all our lathes is of unusually massive construction, and is equipped with extra wide faced cones to enable modern high speed steel to be used advantageously.

We have a lathe catalogue giving all the details of the improved design and construction of our lathes which we would be pleased to send on request.

We are Canada's largest lathe builders.

Representatives:—

QUEBEC:
Williams & Wilson, Limited,
Montreal

MANITOBA:
The A. R. Williams Machinery Co., Ltd,
Winnipeg

Canada Machinery Corporation, Ltd.

GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.

LIDGERWOOD RAILROAD SPECIALTIES

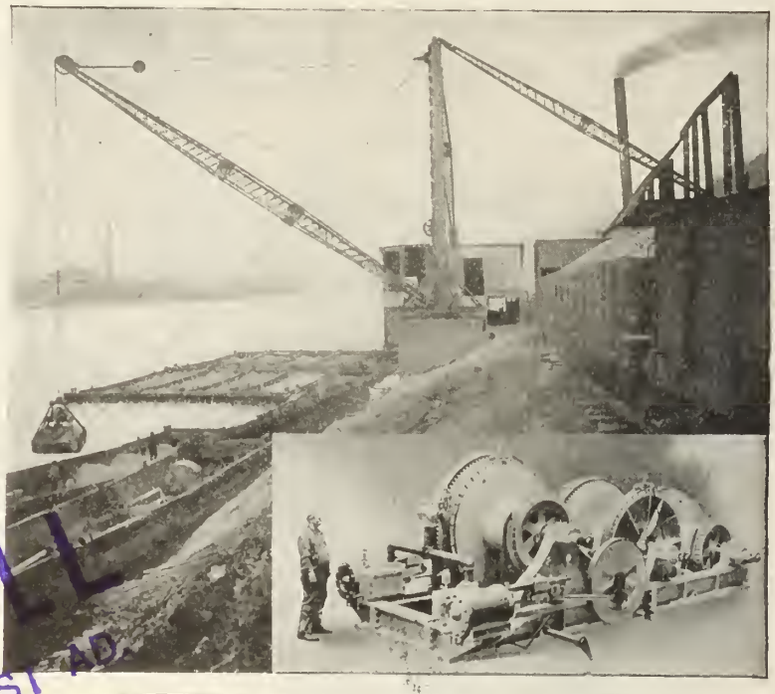
Loading 40 Cars in 10 Hours

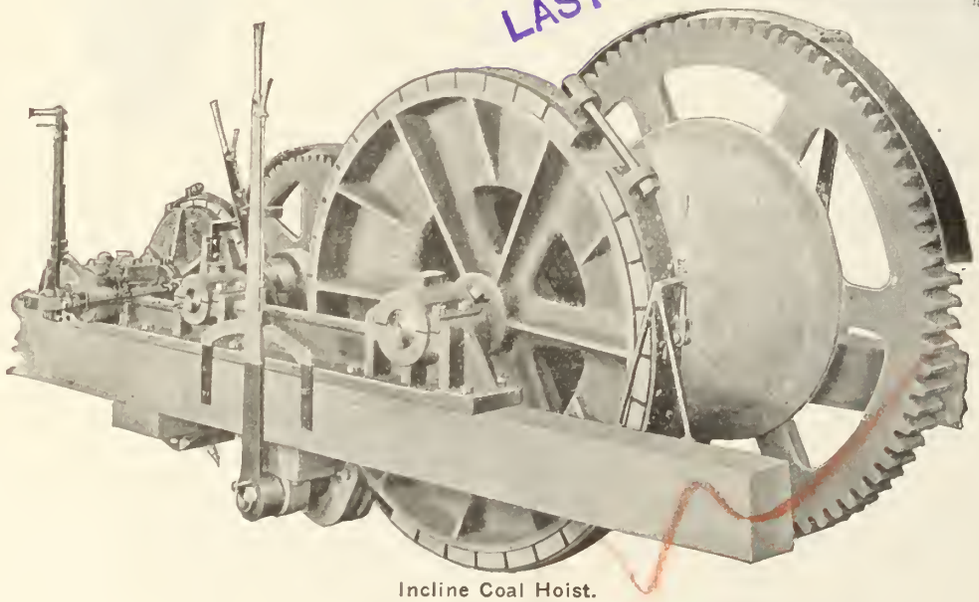
Car Capacity 120,000 lbs. Each

The material handled is sand, which is brought alongside in barges.

A 3-yard bucket is used and 4 cars are loaded per hour. The average day's work is 30 cars, 120,000 lbs. capacity each.

The engine has 14″ x 18″ cylinders, 3 tandem friction drums, 36″ diameter, 27″ face, 72″ friction gears.





Incline Coal Hoist.

INCLINE CAR HAUL HOIST.

These hoists haul loaded coal cars weighing from 100,000 to 150,000 lbs. up inclines to pockets for coaling locomotives and similar work. They contain, among other special features, an **Automatic Brake** to hold cars in any position on the incline and **Cork Insert Friction.** Rope pull, 36,000 lbs. at the drum. Drive—Steam, Electric, Gasoline, Compressed Air, Belt or Chain.

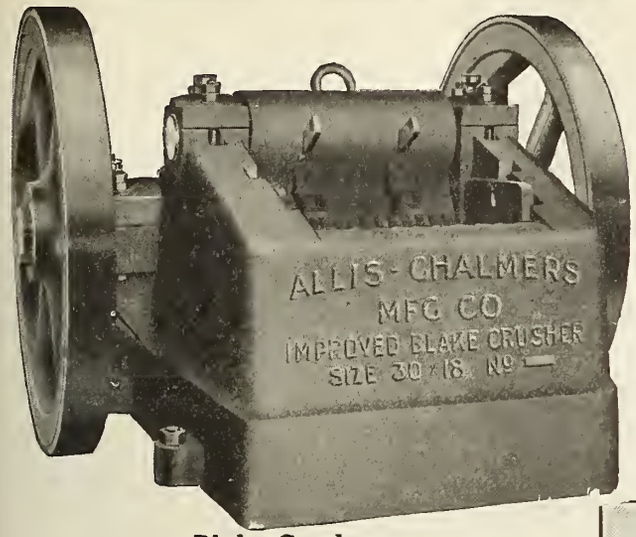
Sole Agents for Canada.

CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

HEAD OFFICES, TORONTO. District Sales Offices, Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



Blake Crusher

CONTRACTORS' EQUIPMENT

ROCK CRUSHERS—GYRATORY OR JAW

Gates "K" gyratory breaker is adapted to reduce all kinds of rock under all conditions. It is stronger, runs smoother, and consumes less power per ton than any other.

When initial cost is the first consideration, the improved Blake Crusher serves a useful purpose. It is built in sizes from 10" x 7" receiving opening, suitable for the smaller mills and crushing plants, up to 36" x 24" receiving opening, suitable for some of the largest plants. We build larger sizes to suit specific requirements. For the plant far from the railroad and having poor transportation facilities, we offer our Reliance type Sectional Blake Crusher.

KOEHRING CONCRETE MIXERS

KILL
LAST AD.

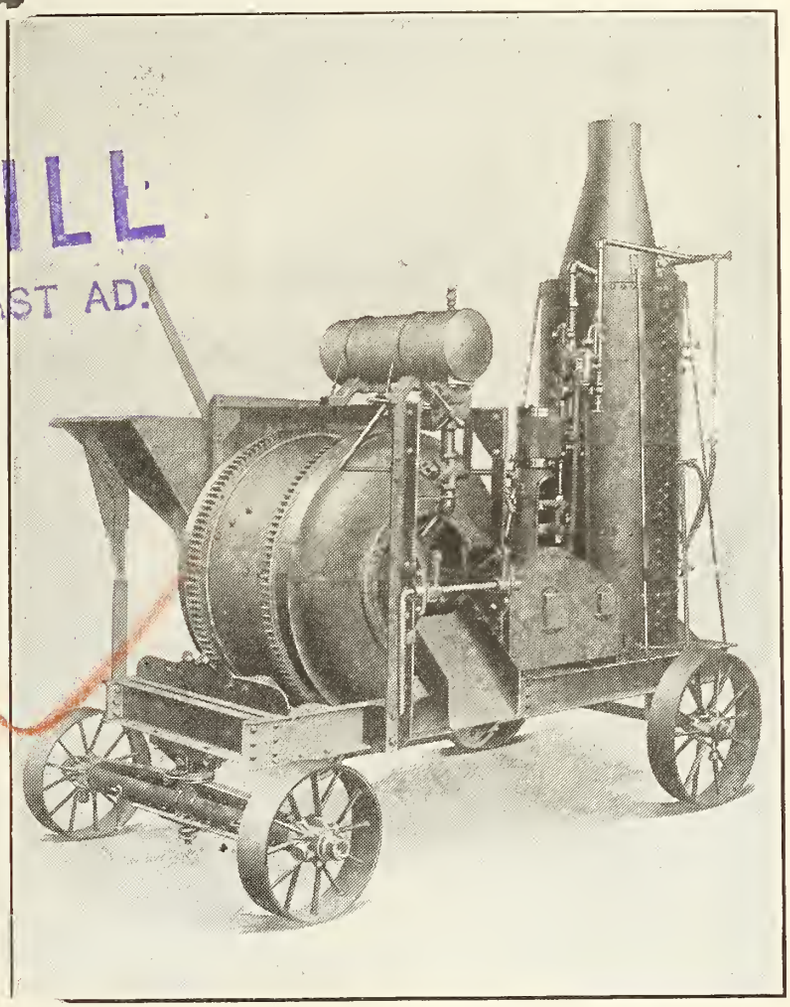
"The Three-In-One."

Mechanical mixers are only used because they mix more thoroughly and more rapidly than hand mixing. The first thing to consider, therefore, in the Koehring mixer, or any other machine, is its mixing principle—will it mix better and faster than other mixers, and why?

In the Koehring mixer there are three independent mixing actions which are constant and opposed to one another. There is a continual intermingling of all the material in the drum, and practically three times as much mixing, which means practically three times as fast mixing as would be possible with any of these actions alone.

Mixers depending for their mixing action on a single series of blades, scoops or faces of the drum, produce a series of flows in which the fine gravitates to the bottom of the mass, and the coarse remains on top. This is entirely overcome in the Koehring principle of three independent and opposed actions producing a perfect intermingling of the entire batch, and therefore absolute uniformity of product.

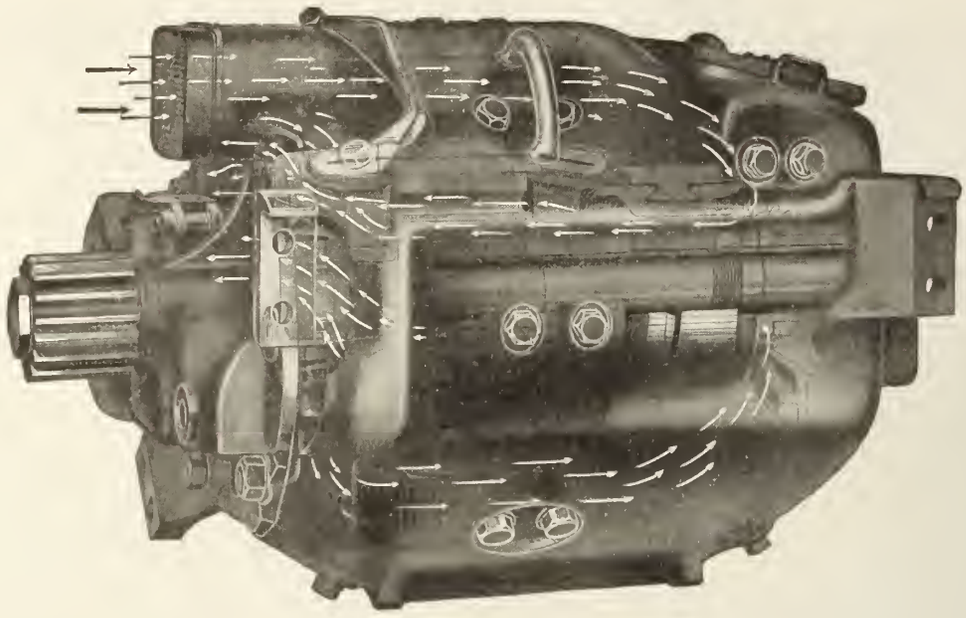
The illustration shows a mixer mounted on trucks with steam power, batch hopper bin and water measuring tank, discharge side showing position of discharge chute.



CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

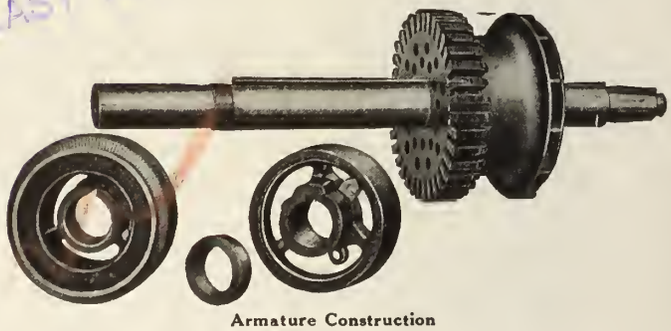


The C-G-E Method of Railway Motor Ventilation Has Revolutionized Railway Motor Design

The fan, mounted integral with the armature core head, draws air through longitudinal ducts in the armature—(see cuts). There are no radial ducts—hence the armature is a solid compact unit which wears well in service and gives the low maintenance which roads are now demanding.

The circulation of air is positive and continuous, over and under the armature, without eddies or cross currents; and hot spots are unknown.

Bulletin A 4171 which gives full information will be sent on request to any of our offices.



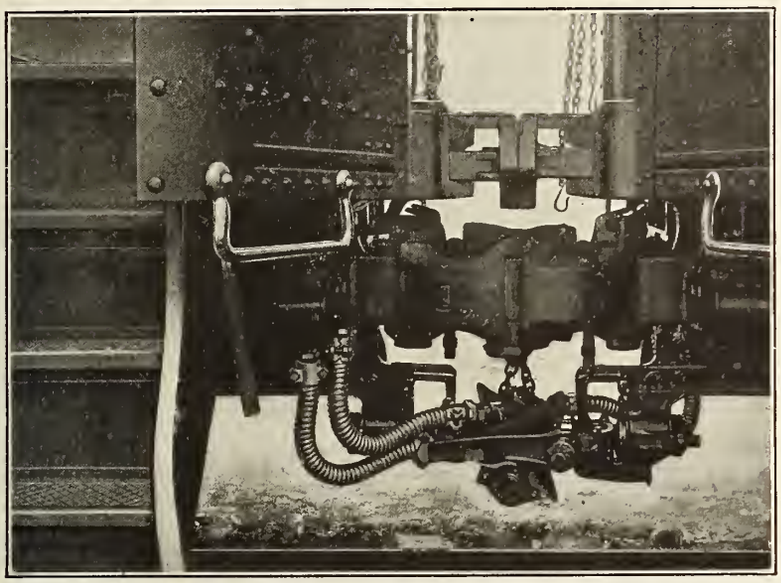
Armature Construction

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

FLEXIBLE STEEL ARMOURED HOSE



Automatic Hose Connector Equipped with Sprague Steel Armoured Hose.

Sprague Flexible Steel Armoured Hose consists of a rubber hose completely covered with an interlocking galvanized steel armour, designed to offer extremely high resistance against external forces or internal pressure.

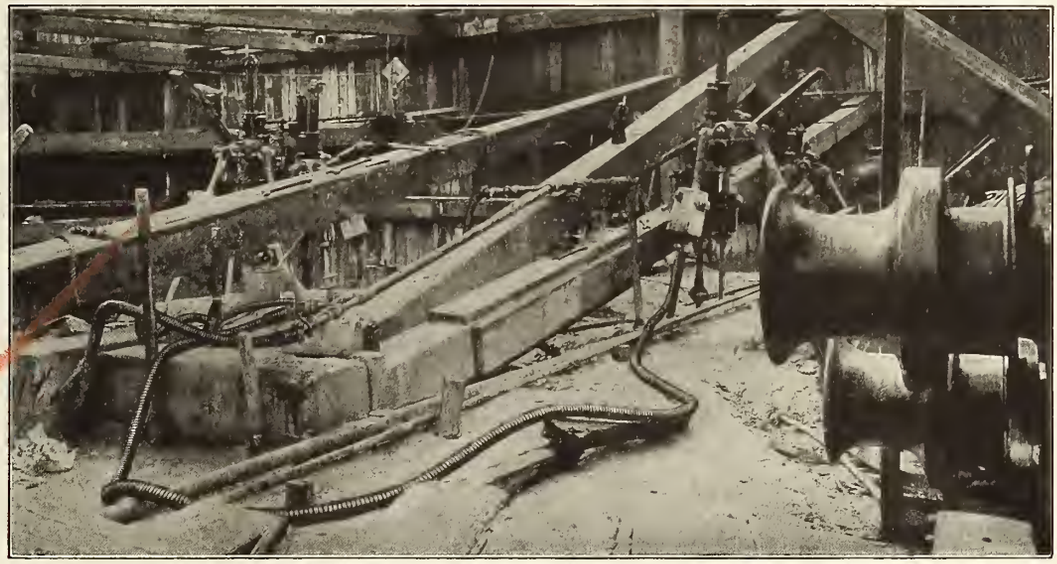
As the armoured hose will withstand a test pressure of 1,000 to 2,000 pounds, depending upon the size, it is apparent that the ARMOUR RELIEVES THE RUBBER HOSE OF THE STRAIN DUE TO INTERNAL PRESSURE and consequently THE DETERIORATION WHICH WOULD OTHERWISE OCCUR DUE TO THE PRESSURE IS NEGLIGIBLE, as well as the variation due to mechanical processes of rubber manufacture.

It is apparent that the STEEL ARMOUR WILL ELIMINATE ALL DAMAGE to the rubber hose DUE TO CHAFING, FLYING BALLAST, ETC., and as this is an extremely large item in air brake service, a VERY GREAT SAVING IS OBTAINED AS A RESULT.

Rough wearing places are met in cuttings, tunnels and shafts, and Flexible Steel Armoured Hose meets these conditions precisely.

The rubber within the armour of this hose merely acts as a conveyance for air, while the pressure is retained by the interlocking galvanized armour, and not alone by the hose proper.

The Special Air Drill Hose is an extra quality of air hose for service where oil is apt to reach the inner tubing.



Excavation Work. The Drills are Connected to Flexible Steel Armoured Hose.

CANADIAN GENERAL ELECTRIC COMPANY,

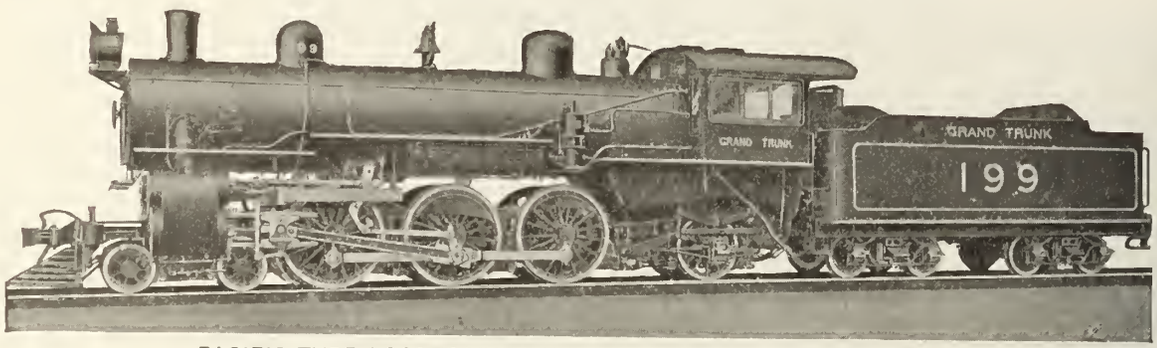
LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

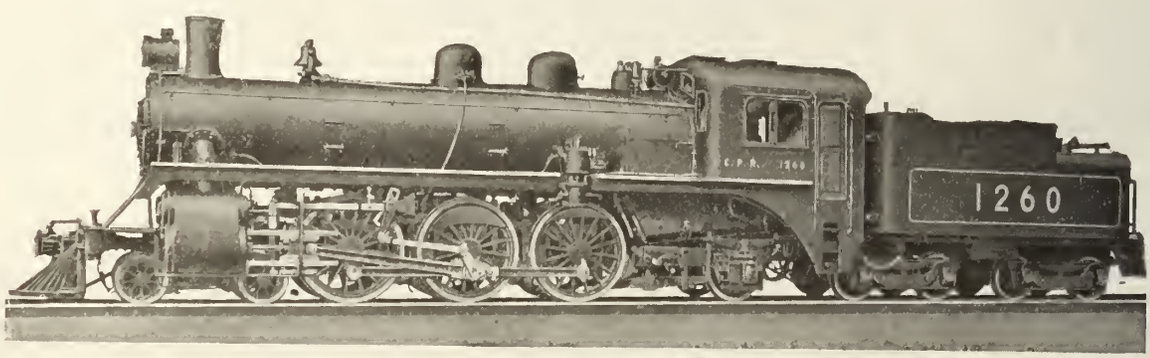
MODERN PACIFICS

FOR FAST PASSENGER SERVICE



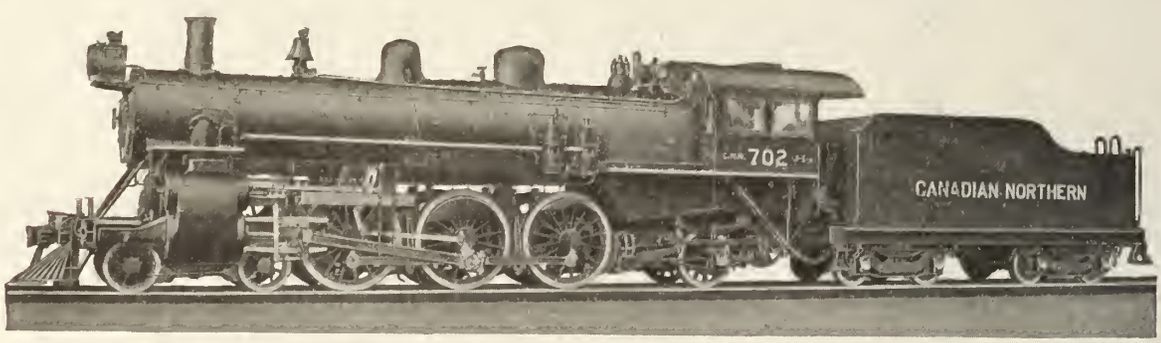
PACIFIC TYPE LOCOMOTIVE BUILT FOR GRAND TRUNK RAILWAY.

Total Weight of Engine, 226,000 pounds; Weight on Drivers, 145,500 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 185 pounds; Cylinders, 23 x 28 Inches; Maximum Tractive Power, 33,900 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN PACIFIC RAILWAY.

Total Weight of Engine, 223,000 pounds; Weight on Drivers, 142,000 pounds; Diameter of Drivers, 70 Inches; Boiler Pressure, 200 pounds; Cylinders, 22½ x 28 inches; Maximum Tractive Power, 34,500 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN NORTHERN RAILWAY.

Total Weight of Engine, 216,000 pounds; Weight on Drivers, 136,400 pounds; Diameter of Drivers, 69 Inches; Boiler Pressure, 170 pounds; Cylinders, 23 x 28 Inches; Maximum Tractive Power, 31,100 pounds.

These locomotives represent the combined knowledge and experience of the officials of the roads and builders.

They were designed and built to fit the physical and operating conditions of the roads.

They include only features which have been thoroughly proven in service, skillfully combined in proportions known to be correct.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

Kinnear Steel Rolling Doors

For Freight Sheds, Round Houses, Warehouses, Etc.

Send for Catalogue.

MUSSENS LIMITED

MONTREAL	TORONTO	COBALT	WINNIPEG	CALGARY
318 St. James St.	155 West Richmond St.	Opp. Right of Way Mine	259-261 Stanley St.	10th Ave. and 3rd St. East

VANCOUVER	QUEBEC	ST. JOHN, N.B.	HALIFAX
101 Water St.	31 St. Louis St.	57 Smythe St.	78 Granville St.

The Right Way To Value Our Rail Report Bulletins

as exemplified in a letter from the chief engineer of an important western system.

"I beg to acknowledge receipt of your favor of January 15th attaching your Bulletin No. 4, which I am glad to receive and have found of great interest and benefit. I know of no suggestion which I could offer to improve the completeness of these excellent reports, which certainly contain a vast deal of valuable information. I am fully alive to the values derived in the proper use of FERRO-TITANIUM alloy, and shall heartily endorse its use when opportunity is presented."

AND THE WRONG

as stated in a letter from the purchasing agent of a southwestern road:

"I think you are in the best position to determine the value of these to you, as it is purely a question as to the value of an advertising medium. If it gets the business that is what you want. If it doesn't bring in the orders it is of no use to you."

In strictly advertising literature it is unusual for a manufacturer to print anything that is not entirely favorable to the advertised article, whereas in this series of Bulletins we are printing the results of tests on a consecutive series of samples regardless of the fact as to whether a particular test is favorable or not; and we are positive that, sooner or later, this will be generally understood and fully appreciated.

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents. Process and Products Patented.

General Offices and Works TPC Reg. U. S. Pat. Off. TRADE MARK. Niagara Falls, N.Y.

Pittsburgh: Oliver Building New York: 15 Wall St. Chicago: Peoples Gas Building

GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Sheffield, England

WHAT DO YOU WANT SIGNALING TO DO?

The prime consideration with regard to any apparatus is, what will it accomplish? What results will it give?

HOW it does these things is a matter for **later** consideration.

Now stop and think a minute of the reasons why signaling protection is necessary.

Certainly not for safety **only,** because traffic can be made absolutely safe merely by limiting train speeds to such a point as to make the limit of vision coincide with safe braking distance.

Clearly then, signaling is not necessary to safety in operating trains. It is necessary to safely operate trains at **high speeds.**

In other words, you can have absolutely safety without signaling. But without signaling you cannot safely secure the maximum efficiency of your track and equipment (which means maximum profit).

What you want signaling to do then is to provide means for securing maximum efficiency of operation, at the lowest cost for that degree of efficiency, with complete assurance of safety to trains.

We believe that any man who will fully investigate the performance of the Simmen System of Signaling on the 114 miles of interurban roads where it is now in service will agree that judged from the standpoints of safety and efficiency and cost **considered together** the Simmen System gives advantages not attainable by any other known method.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

Canadian Locomotives

for contractors, industrial works, railroads, etc.

CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 28 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 7 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 10 tons. Weight of tender in working order 150,000 lbs.

KEEP STANDING
LAST ADVERTISEMENT

We have had fifty years' experience as builders of locomotives. Our expert workmen are in many cases the sons or grandsons of men who worked in our shops many years ago. Combined with this long experience and expert workmanship, we have new equipment, efficient management and expert designers.

Special attention is paid to economy of maintenance; also to design of boiler and fire-box to ensure ample steam capacity and economy of fuel.

Duplicate parts are carried in stock for immediate shipment. We build locomotives to meet the Government regulations of the various Provinces. All sizes—all types—all practical gauges.

All materials used in the construction of Canadian locomotives are the very best. They are subjected to careful inspection and test, and any materials failing to meet the highest standards or showing defects of uniformity are rejected. Any materials developing defects in working are also rejected.

Handsome catalogue, 108 pages, 38 illustrations, with valuable tables and data, free to engineers, contractors or manufacturers—on request.

We are also builders of stationary boilers suitable for contractors or industrial plants.

Canadian Locomotive Company, Limited

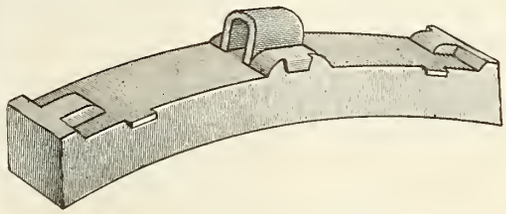
Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly.
New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

Our Improved Reinforced

BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

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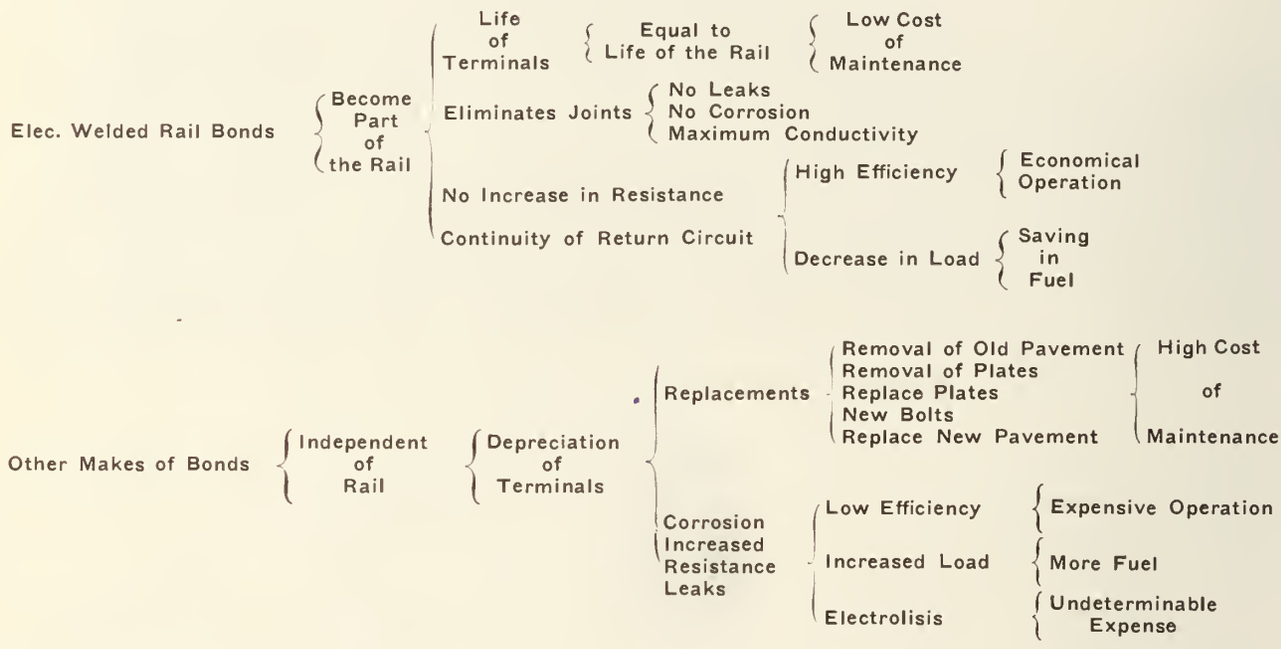

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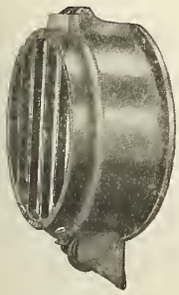
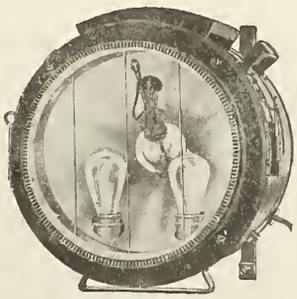
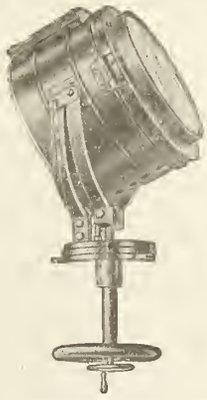


Incandescent—Type W.



Combined Carbon Arc and Incandescent—Type U.

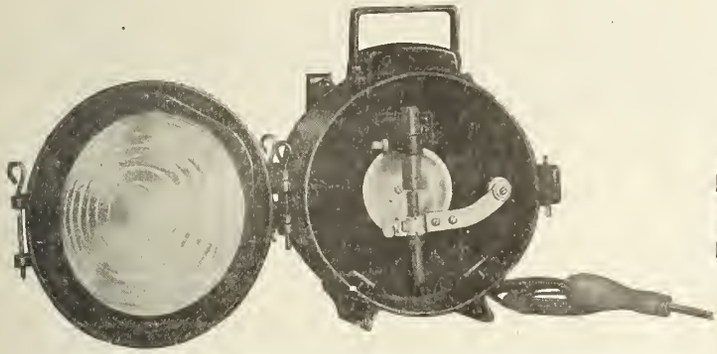


Carbon Arc, for Marine Use—Type X

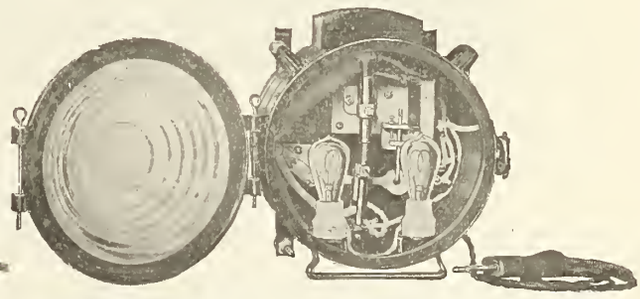
(Front View)

(Side View)

Incandescent—Type Z.



Two-Compartment, Electrode Arc (front view)—Type LK.



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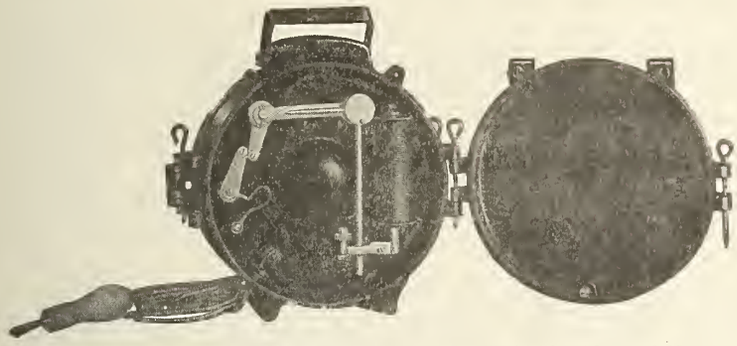
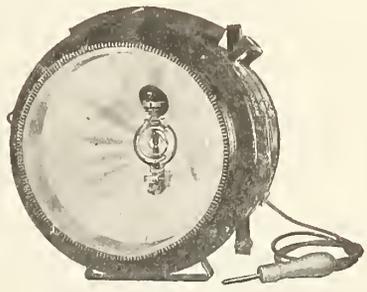


Two-Compartment, Electrode Arc (rear view)—Type LK.



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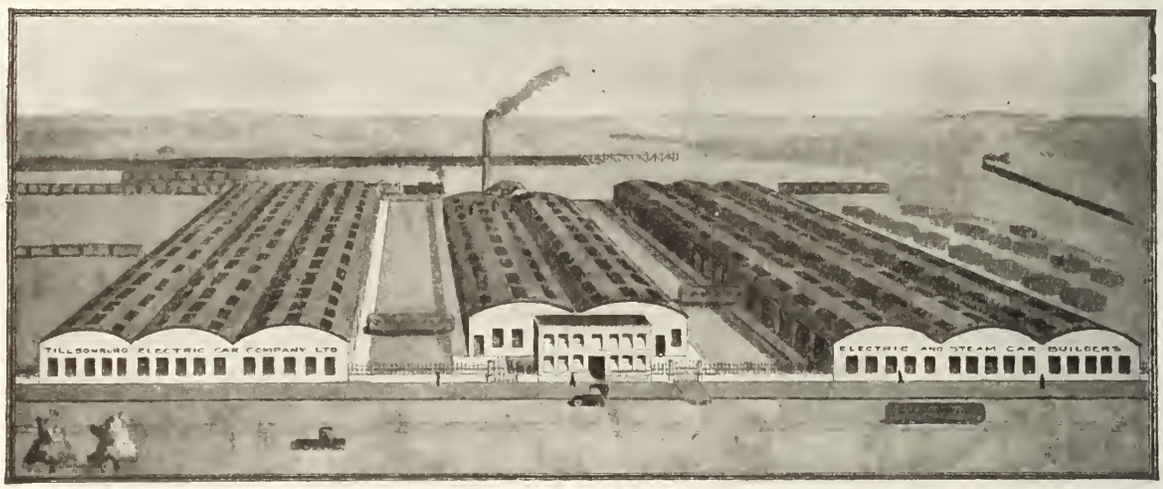

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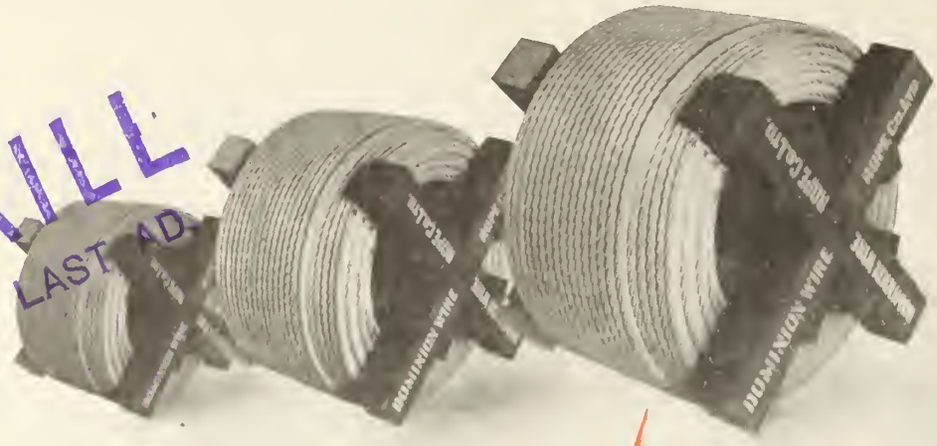

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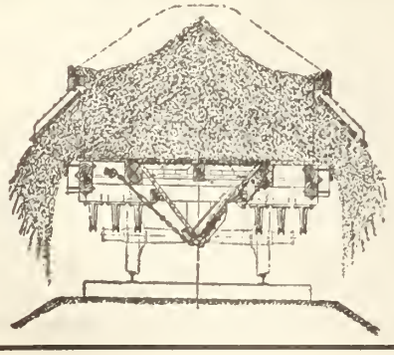

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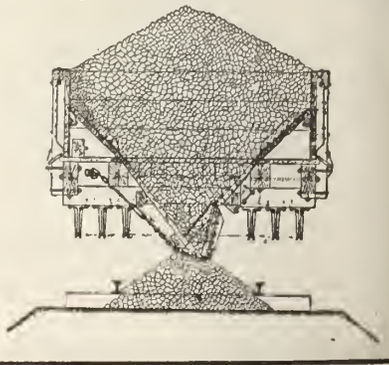

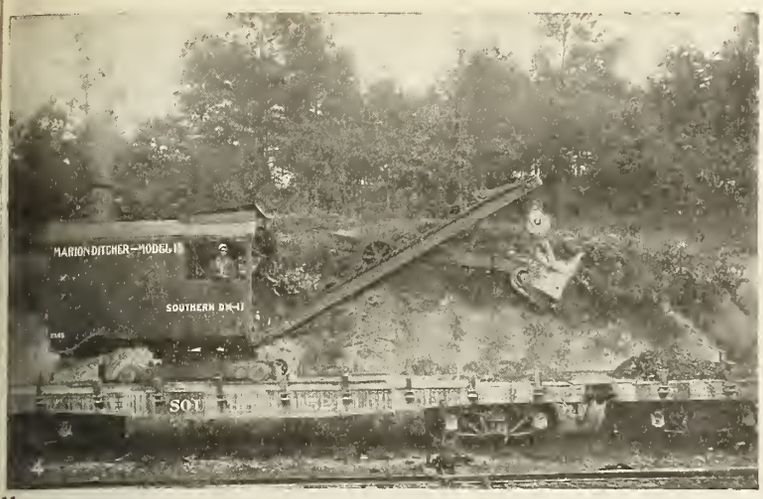

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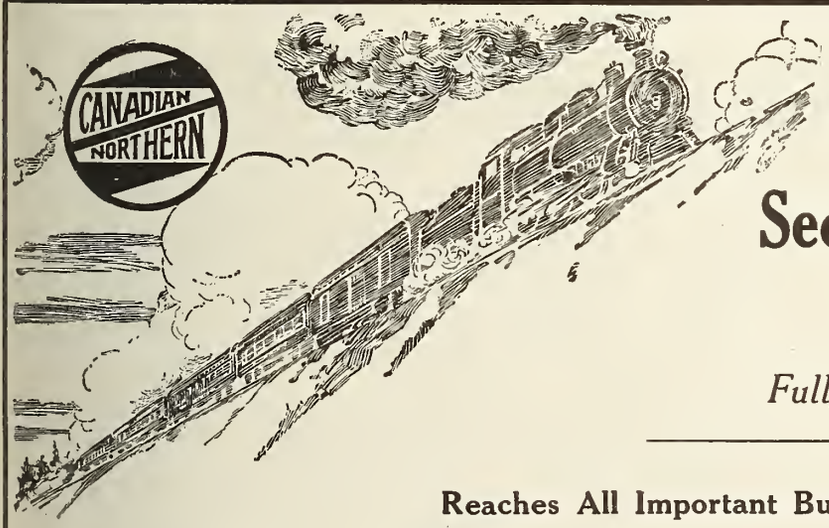

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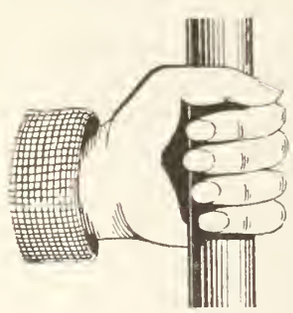

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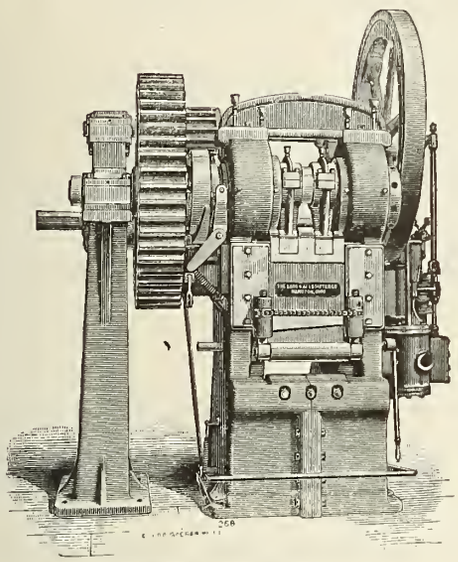

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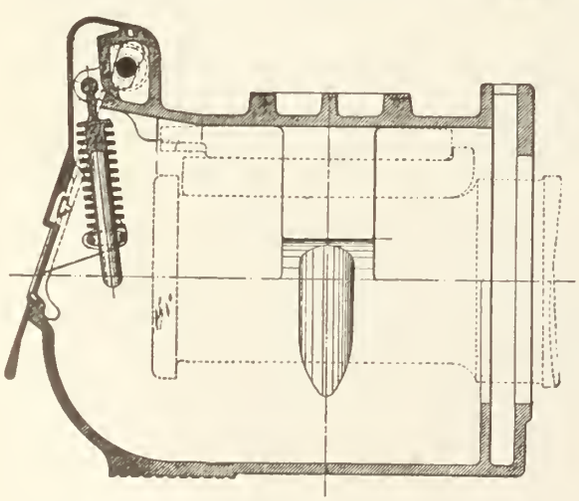

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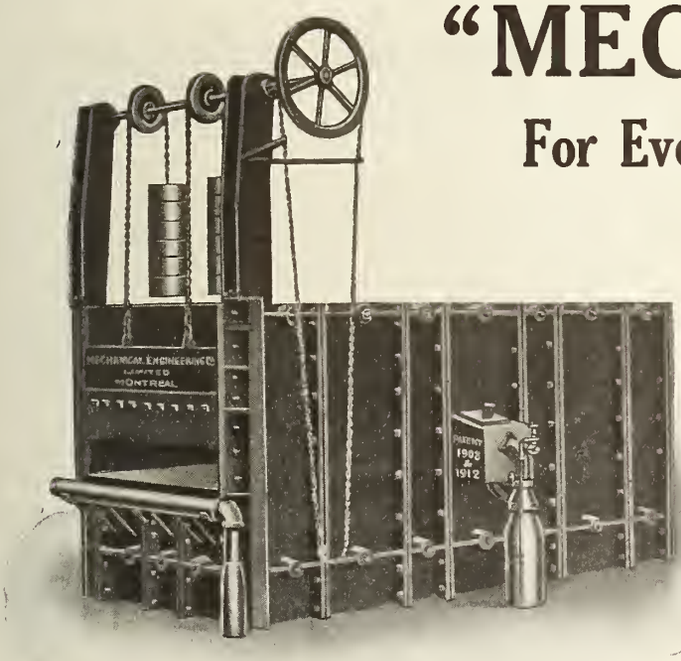

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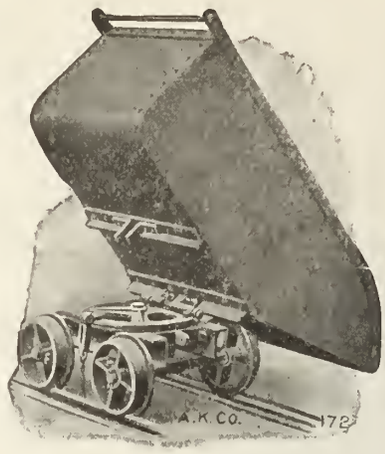

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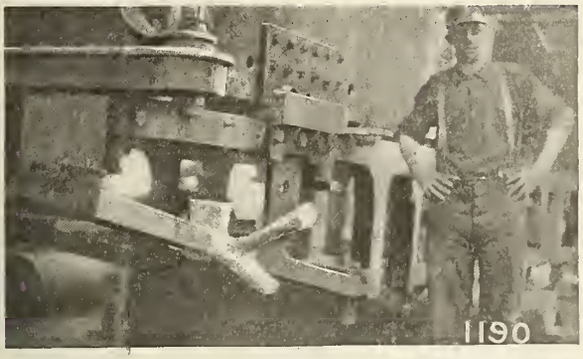

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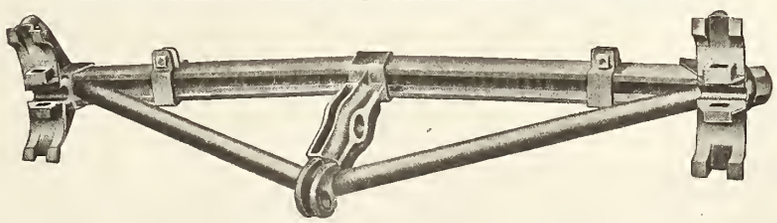

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June, 1914.

Steel Passenger and Freight Car Shop, Angus Shops, Canadian Pacific Railway, Montreal.

By Frederick H. Moody, B.A.Sc.

The steel passenger and freight car shop which the C. P. R. built last year as an addition to its Angus Shops, Montreal, was placed in service late in the year, and since then, while not working to its full capacity owing to the lessened demand for new rolling stock, it has demonstrated the value of a carefully planned shop, in the facility with which the work passes through, and in the expeditious manner in which the work can be fabricated and the parts assembled by the use of the routing system and the shop facilities provided in the layout. A brief preliminary description of the shop appeared in Canadian Railway and Marine World for Aug., 1913.

While the shop is completed to the full size contemplated for present requirements, 10 passenger cars per month and 8 freight cars per day, the interior arrangement, including the location of the machinery and the process of manufacturing the cars is subject to rearrangement, and even in the short time in which the shop has been in operation, the routing of the work has been materially altered in several instances to reduce the amount of handling and for correlated reasons. The operation of the shop will develop improvements, and it was so planned that any improvement might be introduced as developed. The plans were prepared with a view to future enlargement to about double the present capacity as required.

Preparatory to the building of this shop, when the C. P. R. was making its step from all wood to steel underframe, steel frame, and all steel constructions, a complete study was made of the subject, with the idea of building a shop for handling this new work, that would embody only the latest practice. As building the new steel equipment was still in a more or less infant stage, even in the United States, where the building of this class of rolling stock has been going on for the last few years, especial care had to be exercised in the matter of shop planning. With this in view, L. C. Ord, Assistant Master Car Builder, Eastern Lines, then General Car Inspector, made a tour of the principal car shops in this country and the United States, with a view to determining the best practice of all the different makers. The good points in all these shops were observed, which, combined with the original ideas developed by C. P. R. officials, produced the excellent layout to be found in this new shop. At the time of its erection, it probably represented the best practice on this continent, and with the improvements that have been introduced from time to time since it has been in operation, as practice showed where such changes could be made to improve the process, it will no doubt continue to represent the best practice for some time to come.

In designing the shop, 2,750 sq. ft. of floor area per car per day was taken as the average for existing shops, but to prevent overcrowding common in most steel freight car shops, and to allow for the greater amount of room necessitated by the design of the spacing punches, a larger amount of machine room was provided. The final floor area for the freight shop was made 41,785 sq. ft., the area of the machine shop being 22,069 sq. ft., less 7,265 sq. ft., which was set apart for the machinery and assembling of steel centre sills for repair work, giving a total area of 14,795 sq. ft. available for machines. The area of the assembling portion of the freight shop was 9,170 sq. ft., while the erecting area was 17,820 sq. ft.

The shop is located on the west side of the midway which runs through the shop grounds, and is the northernmost shop in the group. It adjoins the old wooden freight car shop and on that side there is no room for any future expansion, but to the north, there is ample room for extension, as contemplated in the layout of the shop as initially planned. This extension may be made without in any way affecting the present arrangement.

There are three main divisions to the shop. The front one may be called the fabricating shop, containing all machinery for working the steel members, and to the rear of this section, is the freight car erecting section on the south, and the passenger car erecting section on the north. The shop is a steel framed structure, with the steel columns carried on concrete piers, resting on bed rock, which at no point in the shop area is more than 4 ft. below the surface, in places coming to the surface. The lower part of the wall is of concrete, 24 ins. thick from the rock surface to the ground level, and 20 ins. thick to a height of 2¾ ft., above which the wall is of red brick, 16 ins. thick, with steel sash. The floor is a 4 in. bed of concrete, with a ⅝ in. mastic surfacing, of a slightly harder constituency than usual, as dictated by experience with other buildings in the plant. The roof is carried on steel trusses, with ample skylight areas. Over the higher sections, the roof consists of 2 by 3 in. planking on edge, separated from a layer of ⅞ in. tongued and grooved boarding by a tar paper, the whole being covered with tar paper, tarred and gravelled. The lower sections of the shop differ in the under layer of the roof, which consists of 2 in. tongued and grooved planking. The skylights are glazed with wired glass, while the side windows have plain glass. The window sills are of concrete. The area of light to the total wall space is apparently 30%.

The fabricating shop consists of two parallel 100 ft. bays, parallel to the midway, the one adjoining the midway being 209½ ft. long, consisting of three 24 ft. sections and five 27½ ft. sections, while the inner bay is one 27½ ft. section shorter on the north end, giving a length of 182 ft. The 24 ft. sections are on the south end of the building, and combined give a 72 ft. width, corresponding to that of the freight car erection section of the shop. Each of the bays is spanned by a steel truss, giving a clear height at the sides of 36 ft. the lower chord of the truss having a rise at the centre of 1 ft. 11 ins. The details of the structural steel work are shown in the cross sectional view of these bays. The columns consist of 24 in. 100 lb. I beams, on each side of which, there is a 15 in. 45 lb. channel and 15 in. 45 lb. I beam for the crane runway support. The roof trusses have a side depth of 9 ft., and a central depth of 11 ft. 2 ins., and are built up of angle iron sections. The crane runway girders in each bay are identical, with a height to base of rail of 28½ ft. These girders are built up of a 36 by ⅜ in. web and six 6 by 11-16 in. flange angles with a crane rail on top. Each bay has a crane span of 96¼ ft., and in each bay there is a 10 ton electrically operated crane of the open lattice type. The parallel 100 ft. bays make an ideal arrangement, the front bay crane handling the material as it comes in, and the other bay, the finished material.

The freight car section consists of a 72 ft. wide extension along the south side of the shop from the far side of the two 100 ft. spans, and comprises two 202½ ft. lengths, the first of which opens along the side into the passenger car shop, the west end being closed along that north side. The full shop length is divided into 18 sections of 22½ ft. by 72 ft. steel spans. This section of the shop is not as high as in the front two bays, having a clear height under the bottom chord of the roof truss of 34½ ft. The trusses have a central depth of 8½ ft., and a side depth of 6 ft. The height to the base of the crane girder rail is 27 ft., the crane span being 67 ft. 7 ins. This bay has a 10 ton electric travelling crane, as in the front bays, only of smaller span.

The passenger car erection section is to the north of the freight car section, and to the west of the north end of the fabricating shop, and consists of four 27½ ft. bays, corresponding to the four 27½ ft. sections of the front bays, these four bays with that of the freight car shops completing the full width of the back of the fabrication bay. This section of the shop is much shallower than either of the other two sections mentioned, and on account of the narrowness of the four bays, a trussed roof is not required, the roof sloping from the central row of columns to each side with a slope of 1 in 12. The clear height under the centre of this section, in the central row of columns, is 30½ ft., and 26 ft. at the sides. Each bay of this section has a separate 2 ton crane, with a 24 ft. 10 in. span, the height to the base of the crane rail being 21 ft. The columns in this section are 8⅝ by 8⅝ in. I beams, at 22½ ft. centres. The crane girders extend into the front section of the shop for 11 ft., the front ends of the crane girders are carried on a column similar to that in the passenger section. These four cranes are controlled through ropes from the floor below.

To maintain the orderly handling of the material through the shop, painted lines are used to define the boundaries of the several piles, and mark the passage ways, which must be kept free of material. These boundary lines are repainted at the end of

each week, at which time an absolute clean up is made of any material which would otherwise tend to accumulate.

Along the front of the shop, between it and the midway, there is a 100 ft. storage space parallel with the midway and shop, spanned by a 10 ton crane having a 96¼ ft. span, and at the same elevation as the two cranes in the front two bays of the shop, being similar to the latter in every particular. The midway crane has a 76 ft. 5 in. span and is lower than the crane referred to, the reason being that it is the intention at some future date to extend the shop from the present east wall to the midway, and as the outside crane in this space is similar to that inside, it will make three parallel bays, similar in all particulars. This outside crane extends a short distance south of the present limit of the shop, and a short distance beyond the north limit as it will be when the contemplated extension to the north is completed.

Along the outside of the south wall of the shop, there is a standard gauge track, extending the full length of the shop, and connecting with the track along the midway through turntables. It is served by the outside yard crane. Through the centre of the outside-crane-served yard at the front, there is a standard gauge track extending nearly the full length of the shop frontage, and connecting with a track through a turntable with a track running into the shop. A cross track from the track along the south wall, connects with this track inside the building. There are also a couple of entry tracks along the south side of the building in the freight car erecting shop section. The standard gauge track through the centre of the front storage yard has one of its rails serve as one rail of a narrow gauge service track, from which there are two tracks leading into the shop through turntables. Through the last section of the front bay, there is a standard gauge track leading in, which crosses the midway, leading through the front bay, paralleling the back bay and passenger car erecting shop along the north wall of the latter parts. The crane of the front bay serves this track.

Through the freight car erecting shop, entering from the rear end, there are two standard gauge tracks at 36 ft. centres, extending the full length of the bay, the both of which at their forward end connecting through turntables with the track along the south wall. These tracks do not lead into the fabricating shop. Through each bay of the passenger car erecting shop section, there is a standard gauge track, leading in from the rear, the track in each section being placed slightly to the north of the centre line, 18 ft. from the south rows of columns, and 9½ ft. from the north rows. These tracks do not extend into the front shop section, but are entered from the rear, where there is a transfer table. Intermediate to each of the shop tracks, extending from the rear wall to the transfer table, there is a standard gauge track, of sufficient length to store a passenger car.

The machinery equipment includes the latest in structural steel working machinery. The division line for the machine equipment for the passenger and freight car sections is the row of columns across the two 100 ft. bays, midway in the length of these bays, the northern section being for passenger car equipment, and the southern portion for the freight car equipment. The passenger car shop equipment consists of the following machinery: Two coping punches, two high speed punches, four spacing punches, angle shears, metal cold saw, metal band saw, bending rolls, plate rolls, plate planer and plate shears. The freight car section contains the following machinery: Five spacing punches, two coping punches and two high speed punches. The individual machines can best be described in dealing with the process of manufacture, to be outlined further on.

The high speed punches are of special construction, designed for this shop by John Bertram and Sons Co., Dundas, Ont. They operate at the high speed of 60 strokes per min., and are belt driven direct to the flywheel of the punch from the motor, without the intervention of gearing. The clutch is of the 6 point type. Two punches are fitted to each head, both being controlled by a single gag lever, which has three positions, one for each punch, and one neutral. These punches are not equipped with spacing tables, as the slow movement of the latter, reduced the advantages to be attained for the high speed. The method adopted was that of using a drilled or punched template, and butting the piece against a gauge inserted in each successive hole in the template. In certain classes of work, the operator can move the material fast enough to catch every hole with the punch running at its 60 strokes per minute. This is three times as fast as on the spacing table, and while only one piece can be handled at a time, for light, short material, it is fully as cheap as when done on the spacer.

Special provision against the holding up of the plant due to a machine breakdown, has been made in a twofold manner. First, by the use of machines of relatively small capacity, but sufficient in number to obviate the expense and delay of changing dies and setting, and to prevent the big accumulation of material necessary to feed the shop without delay. The breakdown of such a large capacity machine would be a serious handicap. Secondly, the additional heavy punches for coping, slotting, etc., are duplicates of those used in the spacing tables, so that, should any of the punches in the spacing table become totally disabled, it would be possible to substitute another punch, either whole or in part, with but short delay, and thereby keep the shop running. The interchange of punches, gags and other jigs has been carefully planned.

The crane served yard in the front of the shop, is used for the storage of the larger parts required in the manufacture of the steel cars, both freight and passenger. The majority of the smaller parts, such as carlines, corner pieces, and similar parts, a large number of which are made in the bulldozer and hydraulic press, come from the

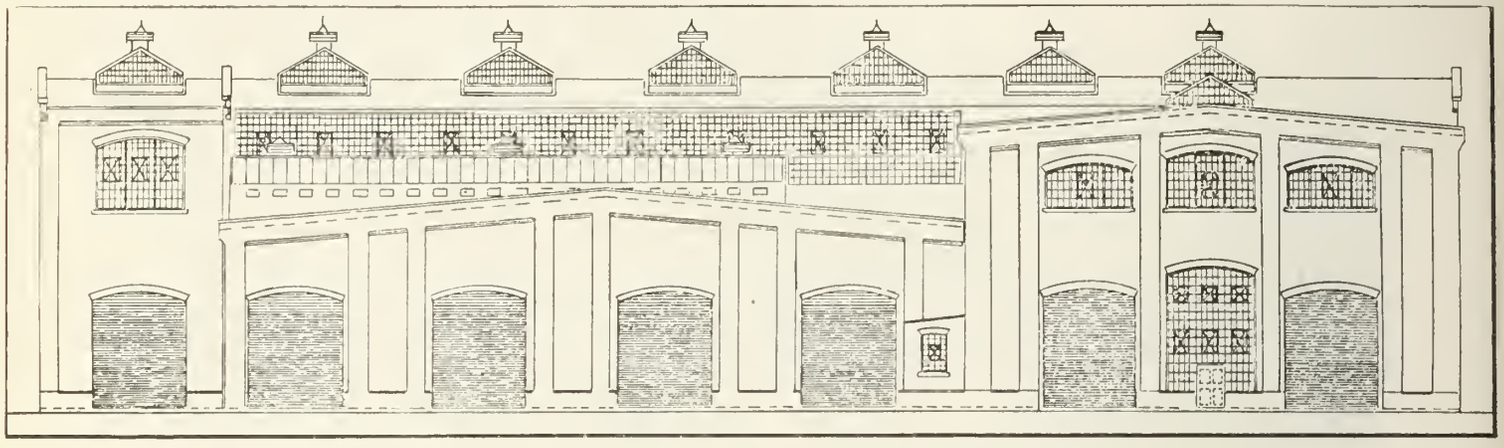


Fig. 1.—Rear Elevation of Steel Car Shop.

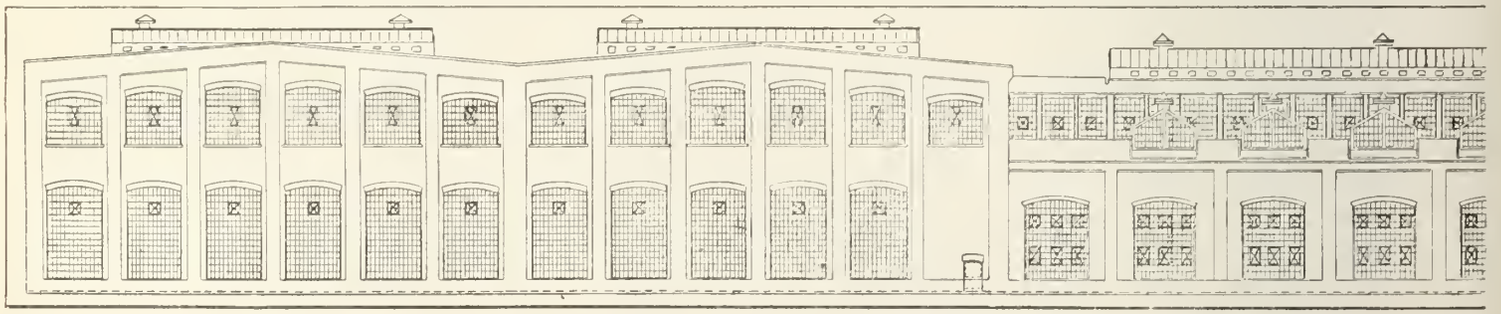


Fig. 2.—Side Elevation of Steel Car Shop (see opposite page).

blacksmith shop, but the other parts, such as sills, stringers, side plates, etc., are all finished in the steel car shop. The material, as brought from the mill, is brought in car lots along the track adjoining the steel car shop, and handled by the yard crane to the several piles shown, where they are conveniently arranged for rehandling into the shop, as required. The heavier of these parts as needed are again handled by the crane, and carried in lots to the north end of the shop, where they are loaded on shop lorries on the track that runs through the end of the east bay, and brought into the shop, where the crane in this bay handles the material to the several machines. The smaller and lighter parts which are stored in the front storage yard, are brought into the shop on the narrow gauge service tracks, to the several machines. The arrangements for expeditious and convenient handling, are excellent. The material can be skidded from the piles on to the shop lorries when required, as when the yard crane breaks down.

The two main service tracks running into the shop in the third and fourth sections from the south, handle most of the material to and from the machines for the freight car work. The centre sills and side sills, which are channel sections, in one piece, are brought in on truck lorries on the northerly of the 2 ft. main service tracks, and just inside the door, opposite the traveller of the centre and side sill web punching machine, are lifted by the crane, and are carried across the traveller, and deposited on three trestles to the back of the traveller. The trestles are topped with rail, for convenience in shifting the channels sections across the top. This storage position is just back of the point from which fig. 6 was taken. Running under the trestles at each end of the sills, there is a 15 in. track, each track carrying a small air jack, the heads of which just clear the under side of the sills when in the lower position. As required, the sills are lifted three at a time, flanges down, and carried down on to the rollers of the traveller, and deposited thereon. The form of the traveller rollers is shown in the foreground of fig 6. For the sill webs, the traveller rollers have narrower faces, and are six in number, and are set so that there is a set of rollers near the side of each of the sills, on which the latter roll. These rollers are adjustable vertically as shown in fig. 6, by means of a long rod from the punch in the background, an arm on each roller stand controlling the location of each set of rollers, all the rollers acting in unison from the central control at the punch. This adjustment is arranged for so as to accommodate shapes of different depths. On the far side of the punch, as shown on the left in fig. 6, there is a similar set of spacing rollers, differing only in that over top of the rollers there is an elevated runway carrying the traveller head, which is clearly shown on the left in fig. 6. This head works automatically in spacing the sills under the punch for the requisite punching. On the punch end of the head, there are projecting jaws, in which the member to be punched is gripped. Along the operating side of the traveller head track, there is a spacing template, laid out with projecting pins, which engage a trip lever suspended from that side of the head. This suspended lever, on striking a pin, closes an electric circuit, which arrests the travel of the head, and closes the circuit of punch control, the punch dies descending through the work. This template is laid out to give the requisite spacing of the holes throughout the length of the member to be punched, and is easily removable, when another pattern is to be punched. The templates are made of wooden strips 3 by ⅞ in., and the projecting pins are of 3 in. nails, cut off so that the end projects about ½ in. above the surface of the strip. The travel of the head being automatic, the pins arrest the travel at the required points, punching the holes at the points required. Permanent steel templates may be used. The punch is of a powerful type, and punches as many as three ¾ in. holes in each of the three sills at one stroke. The punch has a gagging attachment, controlled by the operator. At each of the points at which the automatic head arrests the forward travel, the operator places out of operation the desired punches by this gagging arrangement. The pass through the machine is very rapid, and the accuracy of the spacing mechanism is such that the punching error is very slight, and is not as great as if each hole was laid out independently, as punched in an ordinary punch.

As the sills pass through three at a time, and have all the web holes punched, they are released from the jaws of the traveller head, when the latter is in the position shown on the left in fig. 6, and the three sills are lifted out by two jib cranes, one of which is shown on the left at the end of the traveller table, in fig. 6. The other is just back of the position from which the view was taken. These two jibs deposit the sills in the storage space made by the bent rails

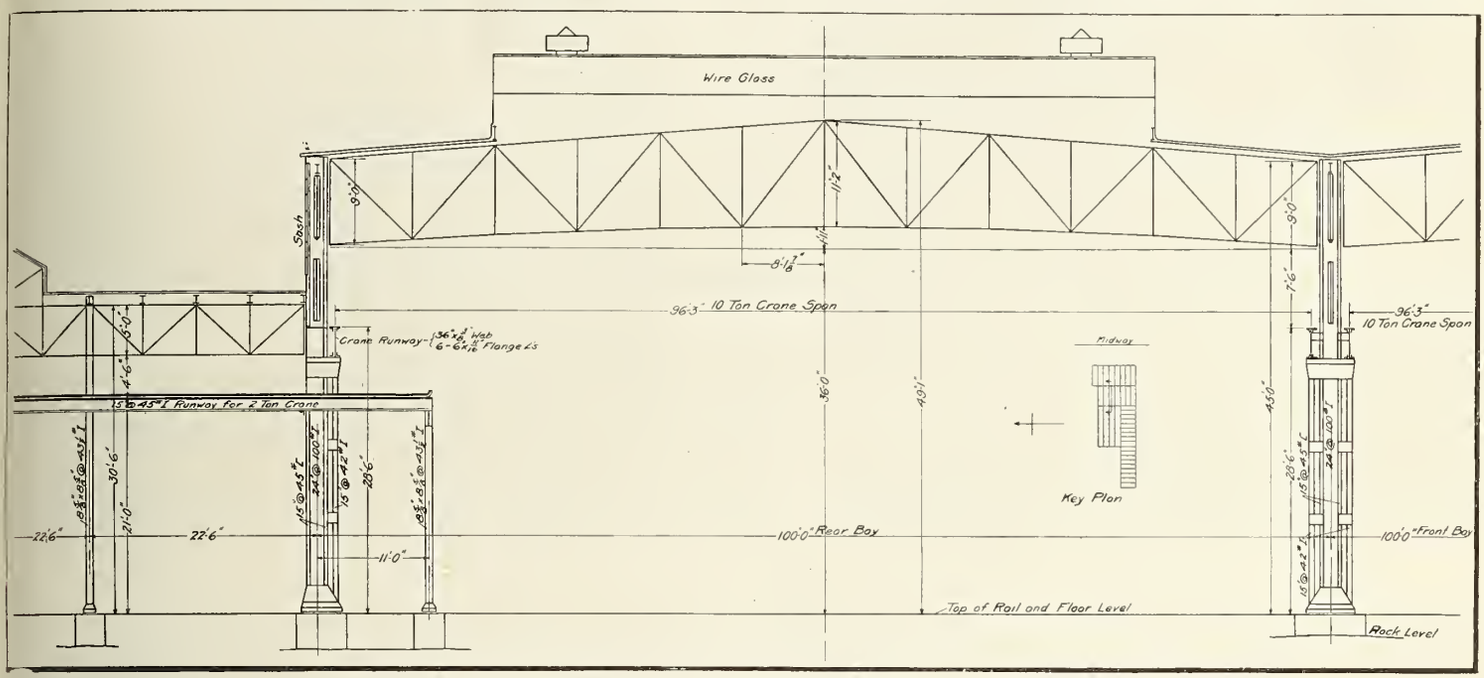


Fig. 3.—Cross section through Front Bays of Steel Car Shop.

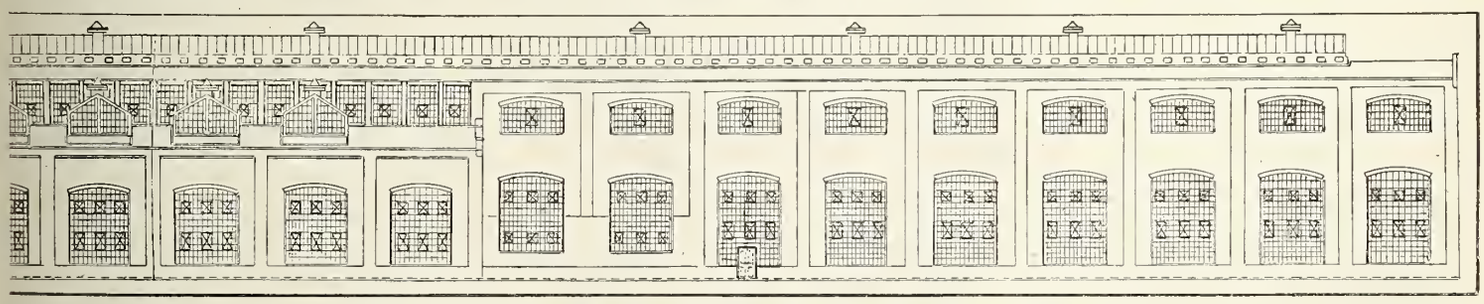


Fig. 2 (contd.).—Side Elevation of Steel Car Shop (see opposite page)

in the lower left foreground.

The next operation is that of punching the flange holes in the sill members, in the punch shown to the right of the storage pile in fig. 4. The entry table of the latter is right hand pair in the foreground. In the bottom of these U retainers, there are rollers, along which the sills are moved into line with the entry carriage. On the column back of these rollers, there is a stationary again passed through for the punching of the holes in the flanges on the other side. The inner 100 ft. crane picks up the flanges on the completion of this operation, and carries them over to the punch along the south

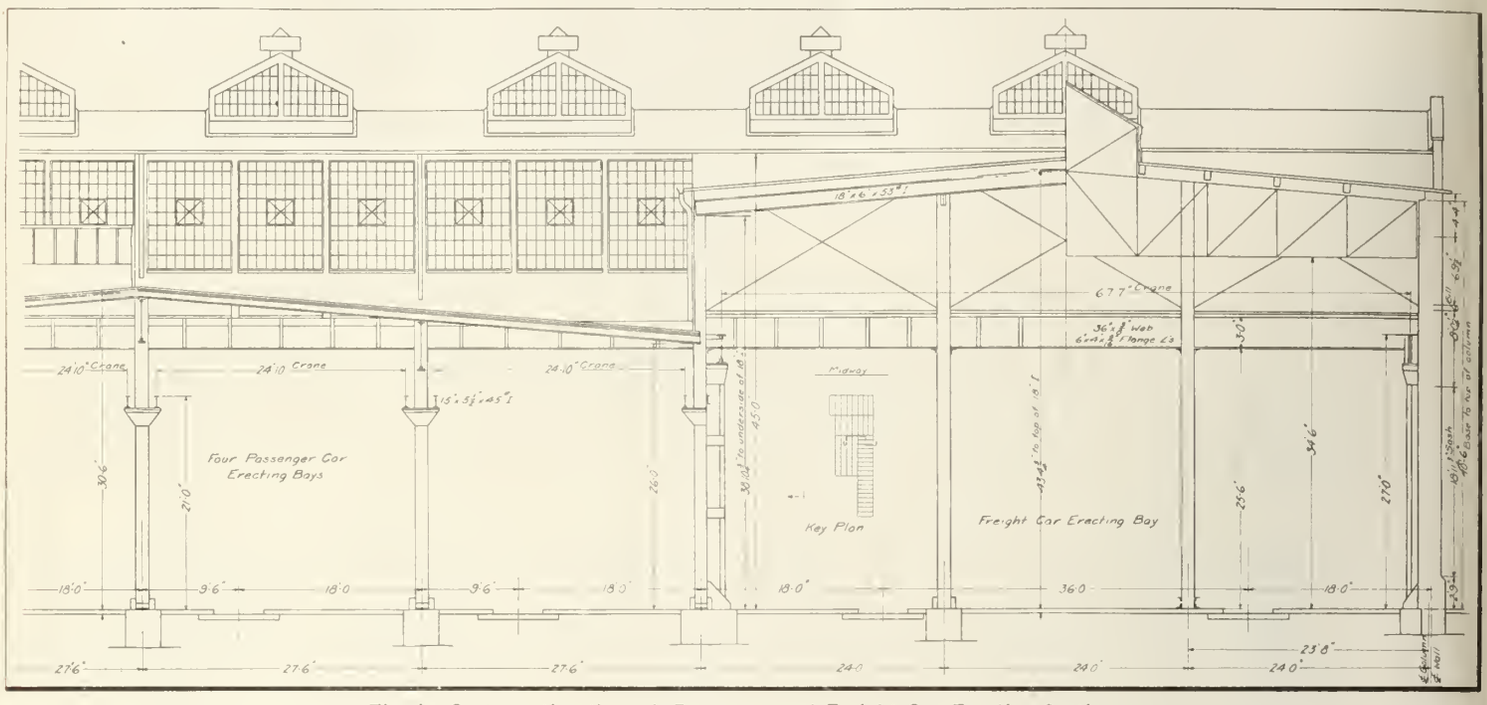


Fig. 4.—Cross section through Passenger and Freight Car Erection Sections.

placed directly opposite the delivery end of the web punch for obvious reasons. The traveller rollers in this case have wider surfaces, as the sills travel through the punch resting their flanges, two at a time, back to back. In the storage pile, a pair of jib, as shown in this view, by means of which the pair of sills are lifted on the rollers, and run into the machine, where the sills are clamped by the traveller head on the far side. The sills pass through the punch, and have all the flange holes punch wall where the draft gear slot is punched. This completes the operation on the sills.

With the present output of the shop, the web punching spacer works as described for only one half the time, the balance of the time being used on cover plates and similar

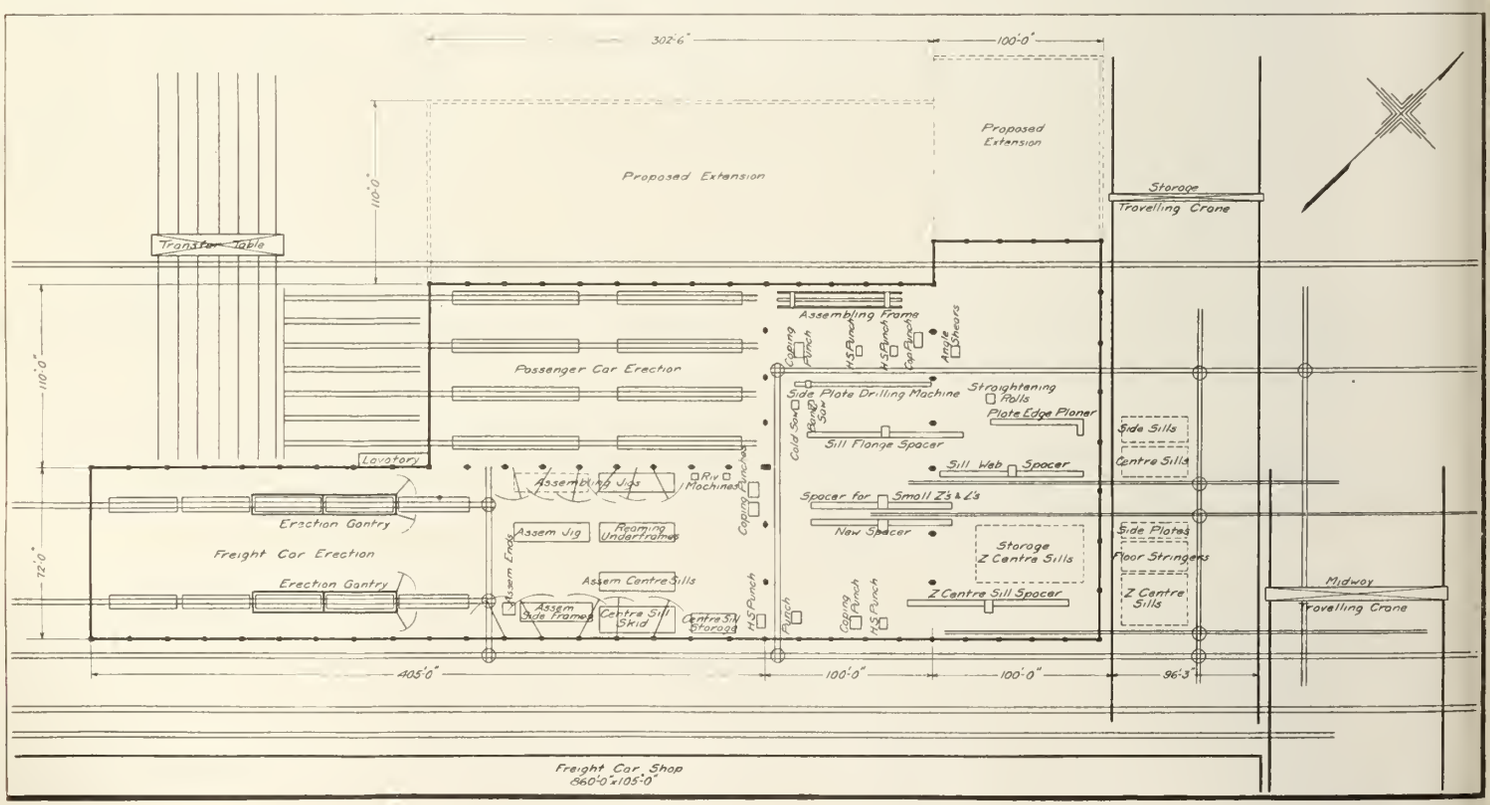


Fig. 5.—Plan of Steel Car Shop, showing Machinery Location.

the sills are bolted together, back to back, and lifted from the pile by the same jibs, and deposited by them in the U forms between the storage pile and the entry rollers of the second traveller, as shown by the ed. When through to the far end, the sills are disengaged from the head clamps, and pushed back to the starting point, where they are again lifted by the stationary jib crane, and turned over in a chain loop, and flat work. The new punch shown, has been installed for the flanges, and the spacing table so set up that without disarranging the handling of the material, it will be possible to double the output of these machines.

With this coping punch having a spacing table, with the addition of another, an extra coping punch, the machine capacity might be readily increased to 25 cars a day.

The Z bars for the top rails, and the cross bracing for the car frames, enter the shop on the southernmost of the two main service tracks, to the point shown in fig. 7, passing through the punch on the right in that view, two at a time. On the first pass the holes had by the use of clamps instead of bolts. All the parts that enter into this assembling operation are stored conveniently under the assembling frames, as shown.

The riveting stand is over against the row of columns, in the left background of fig. 9, and resembles in most particulars the passenger car assembling frame shown in fig. 16. The object of this frame is to hold the several members in perfect alignment, peditiously. The bolsters and cross bearers have surfaces which are not parallel with the floor. By the use of this suspending arrangement, the bull can be tilted so as to be at right angles to the member being rivetted in all positions. All the main rivetting is completed here with the bulls, and some of the minor rivetting completed concurrently with small air hammers. The partially completed underframe is then

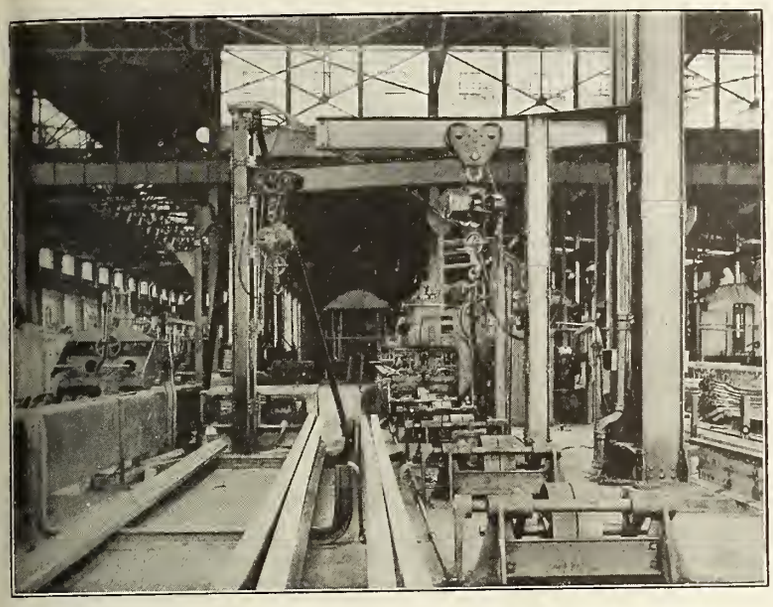


Fig. 6.—Freight Car Sills passing between Web and Flange Punches.

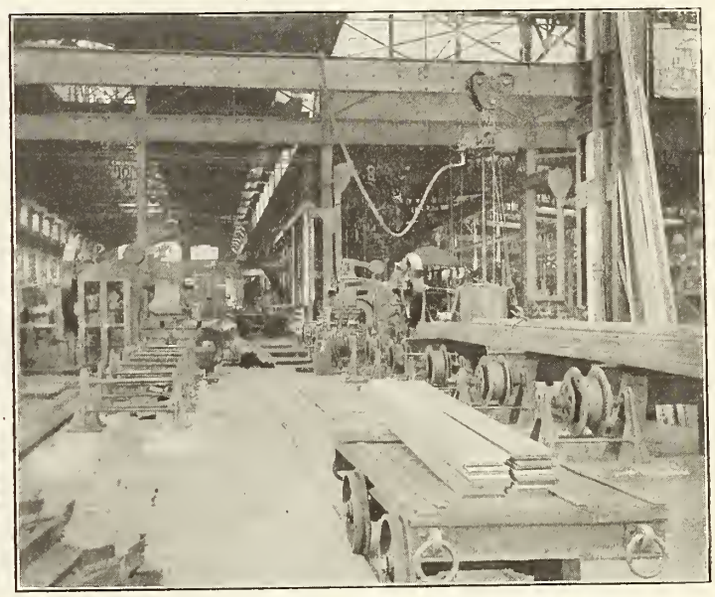


Fig. 7.—Punch for Handling Steel Car Z Bar Sections.

in the Z bar flanges are punched, and on a second pass, the holes in the web are punched, all in the same manner as in the passing through of the sills. The completed Z bar members are piled on the floor at the far end of the machine, as shown in the background in fig. 7. This completes the machining of the different members of the car.

The next step is the assembling of the centre sills, just inside the freight car erecting shop, at the point shown in fig. 8. The final steps in the punching of the centre sills are made in the punch shown in the immediate foreground of fig. 8, which is just inside the erecting shop. Through this punch, the centre sills are run on the trestles shown in the background. The first step in the assembling operation is to attach with bolts the draft gear castings. The individual sill members are then moved across to the right, where the separators and centre pin castings are applied, the two sills being fastened together by these members, the whole structure being temporarily bolted together. Along the row of columns adjoining, which separate the two erecting shops, there is a craneway, with traveller overhead, for handling the completed structure. This craneway is shown in the background on the columns in fig. 9.

The next operation is that of assembling the underframes in the foreground in fig. 9. Here, there are four wooden stands, on which are placed the bottom members of the body bolsters and cross bearers, as shown. There are two sets of stands for this operation, the one adjoining being used for the same purpose. The location of the four stands is exactly as in the completed car. On the located under members, the assembled centre sill is placed, being carried across from the assembling position. It is located directly in the centre, and around it are assembled the side members of the bolsters and cross bearers, and the top plates of these members placed on top. The whole structure is clamped together, ready for the rivetting, an important gain being so that the rivetting may be accomplished. This rivetting frame consists of several cast iron pedestals, one under each centre pin, and one under each end of the bolsters and cross bearers, the end of the latter being recessed so as to hold the several ends in perfect alignment. The result of this arrangement is that the rivetting may be proceeded with without the necessity of

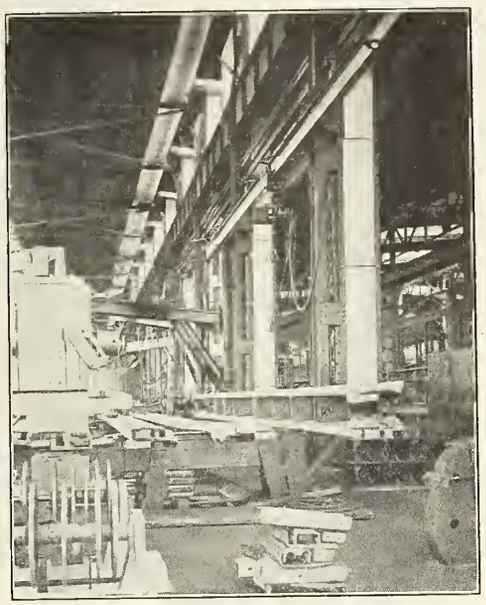


Fig. 8.—Assembling Centre Sills for Steel Box Cars.

constant checking up of the members for squareness. Along the row of columns as shown in fig. 9, there are three jib cranes, one to each of the columns at the end of the rivetting frame, and one midway. These handle the rivetting bulls, which are suspended in the manner shown in fig. 10. This arrangement is one of the special features by which the work can be handled expeditiously. The bolsters and cross bearers have surfaces which are not parallel with the floor. By the use of this suspending arrangement, the bull can be tilted so as to be at right angles to the member being rivetted in all positions. All the main rivetting is completed here with the bulls, and some of the minor rivetting completed concurrently with small air hammers. The partially completed underframe is then moved down the shop another length, and the balance of the rivetting completed. The underframe is then ready for final assembling into the car structure.

To rivet the underframe on the jig by the riveters without turning it over, it was necessary to have a special type of rivetter, designed with a thin nose, to permit the top row of rivets to be driven and to allow sufficient clearance for the bottom row, particularly on the bolsters, to be driven without moving the underframe. A heavy block of cast steel is used for the top die, with a small high-speed steel insert. It is not possible to use a high speed steel snap for ordinary work, as it is extremely liable to break, but when it is inserted in the cast steel block, it is well supported and does not fracture. The amount of steel for renewals is so small that the cost is inconsiderable.

The only portion of the steel car output which is fixed is that of rivetting the underframe with the rivetter, which limits the capacity to 14 to 15 cars per day. It is the intention to increase this stage of the work by the installation of another rivetting frame, as all the other positions can easily handle 25 cars a day, by the addition of more help where required.

The top side rails are assembled in the stand shown in fig. 11, which is located along the south wall. The connecting members are all bolted to it, when it is ready for passing along to the side frame assembling operation, which is shown in fig. 12. The side and end frame assembling stands are similar in construction, and are both shown in this illustration. They consist of a bar iron frame, on the top of which, there are sheet iron forms into which the various members comprising the side frame and end frame are thrown, the jig automatically locating them in their proper relation to each other, in the manner shown in the illustration. Here the parts are first clamped together, and then rivetted by two bulls suspended from jib cranes on the side wall columns. The completed side and end frames are then picked up by the overhead crane and passed

along down the shop to the position shown on the left in fig. 13, which also shows the final assembling frames. At this point, the completed trucks from the truck shop are brought into the shop through the side door, and turned into the assembling track, just back of the point from which this view was taken. The completed underframe is brought down the shop from the underframe assembling stand, and placed on the awaiting trucks, the understructure of the car then being ready to pass into the final assembling frame, shown in this illustration. There are two of these frames, so that from the truck and underframe assembling point, the final assembling may be carried on along both tracks.

This assembling frame consists of a steel gantry, straddling the erecting track, carrying on the frame columns at the near end, jib cranes. On the top of the frame, there is a travelling crane, of novel design, the upper part having drops, to the lower end of which there is a cross track attached, consisting of an I beam member, the ends of which project beyond the sides of the assembling frame, so that it can pick up the side frames and swing them into position on the car. The car as it stands at the end of the frame, before entering the latter, has the end frame at that end applied by the end jib cranes, and bolted into place. When run into the assembling frame, the side frames of the car are lifted into place by the overhead traveller, and bolted into position. The assembling frame is the length of two cars, and on the bolting together of the car frame, the car is moved down into the second section of the assembling frame, and the carlines applied and the rivetting of the assembled members proceeded with. Practically all the rivetting is completed as the car leaves the frame, the balance being completed at the end of the shop. After the assembling of the draft gear, brake rigging, etc., in this final position, the car is ready to be hauled out by a tractor at the end of the shop, this tractor also being used for moving the string of cars in their several stages of completion, from point to point in their process of erection. The cars, on removal from the steel car shop, are taken to the wood freight car shop for sheathing in the conventional manner, which has previously been outlined in these columns.

The southeast corner of the steel car shop is reserved for the handling of Z bar centre sill work, of which there is a great deal. The C. P. R. some time ago adopted the policy of replacing all wooden centre sills on wooden box cars, when the sills required replacement, with a special type of Z bar centre sill, which could be applied to the wooden car without a very great change in the underframe design. With the exception of the draft gear fittings, this centre sill consists of two Z bars, the length of the car. Fig. 14 shows the arrangement in the southeast corner of the shop for handling this particular piece of work, and while included in the steel car shop section must be considered purely as a repair job.

The Z bars for the centre sills are stored in the pile adjoining the 2 ft. service track, which enters the front of the building along the south side. These sills are loaded on shop lorries on this track by the overhead yard crane. The track leads into the shop at the point shown in the foreground in fig. 14, the view being taken from the door at that corner of the building. The lorries are run along this track to the far side of the punch shown in the view for passage through the punch coming this way. Overhead of this position on the far side of the punch, there is an overhead I beam traveller, at right angle to the service track, and sus-

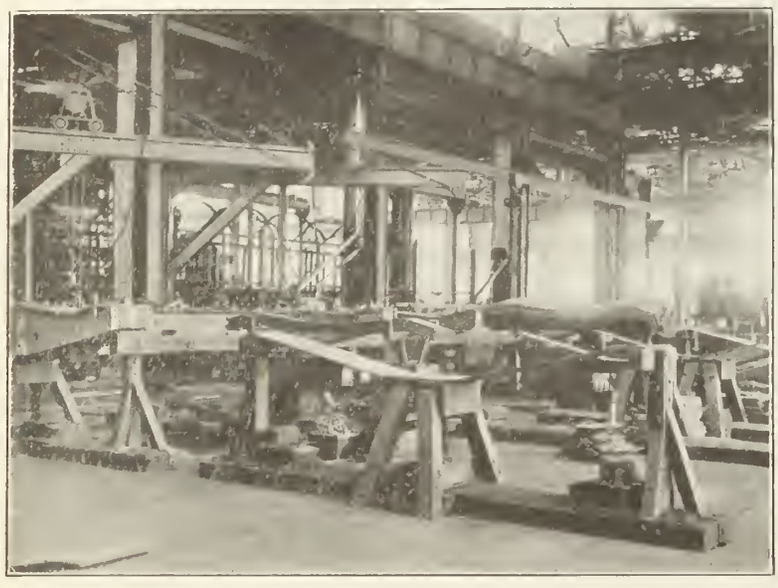


Fig. 9.—Assembling Underframe of Steel Freight Car.

Fig. 10.—Suspending Mechanism for Bull Rivetters.

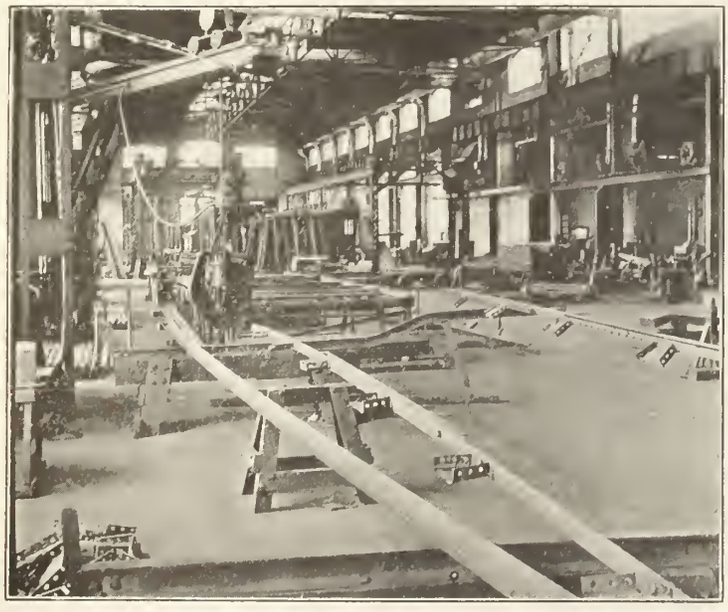


Fig. 11.—Assembling Parts for Steel Freight Car Side Ralls.

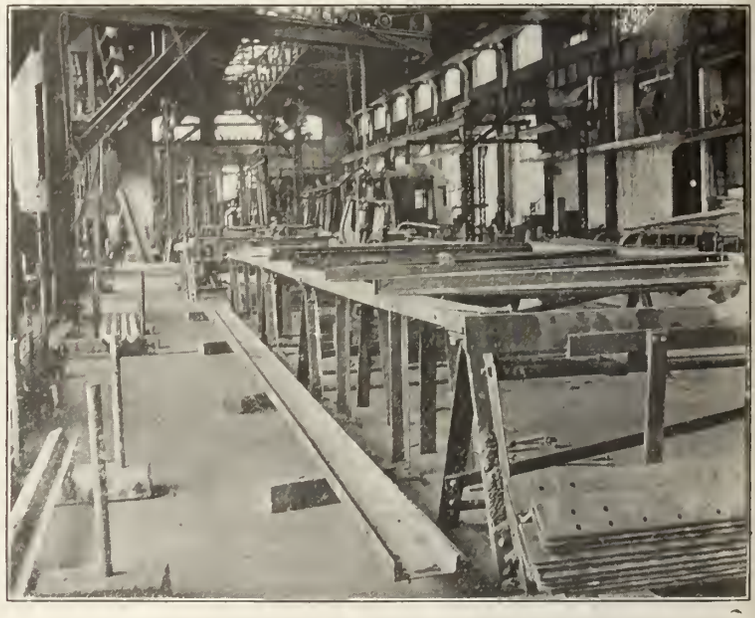


Fig. 12.—Assembling Steel Freight Car Side and End Frames.

pended from the underside of the overhead heater platform. On top of the lorries, there are wooden blocks, with rail sections across the top. To the right of the track, there are three trestles, with rail tops, at the same level as those on the lorries. On the track end of each trestle, there is a small jib, the surface of which is level with that of the trestles and lorries, so that for unloading the latter, it is only necessary to swing the jibs under the Z bars on the lorries, and slide the Z bars across on to the trestles. The usual practice, however, is to lift the load from the lorry by the overhead traveller, depositing the load on the trestle rails.

Two 15 in. tracks are laid on the floor, one just inside each of the outer trestles, and parallel with the trestle. Each track carries a small carriage on which is a small air jack, by means of which the Z bars are lifted in pairs, and carried across to the supporting rollers of the punch traveller. The bars pass through in the manner already outlined earlier in the article, having the holes in both flanges punched in this pass, the traveller head being on this side of the punch as shown, and travelling in this direction. Under each end of the traveller table, there is an air cylinder, which raises the Z bars on completion of the first pass, so that the two sloping jibs shown fastened to the side of the traveller table, may be swung underneath. Lowering the bars on these jibs causes the bars to slide down into the pile in the foreground.

The stationary jib crane on the left in fig. 12 raises the bars, several at a time, to the lorry, which carries them along to the other end of the machine for the second pass through, for the web holes, in the same manner as before, the process from the lorry being similar. Back of the traveller table, to the right in fig. 14, there are three trestles, extending clear back to the southerly of the two main service tracks. On the near end of these trestles, there are small swinging jibs, the top of which are flush with the trestle top. On the raising of the Z bars on the traveller table by the vertical air cylinders, these jibs are swung underneath, and the bars pushed along on the trestle. On the other end of the trestle, the centre sills are completely assembled, when they are taken out of the shop either by the travelling crane to the far end of the shop, or else through the southerly of the main service tracks.

The passenger car fabricating section occupies the north end of the two 100 ft. bays, and is shown in fig. 15. As detailed a description of the process through which the parts pass in their course through the shop, cannot be given, as the manufacture of steel passenger cars is such a new departure for the C. P. R. that the process is constantly being improved upon, and as complete a system as that in use with the freight cars has not been developed.

The arrangement of the machines is very similar to that in the freight car section, except that it is not possible to get enough work of the same class with the relatively small output to use spacing tables to advantage. A coping punch is, therefore, fitted up with rollers for the convenient handling of long material, and the work is punched to gauge much in the same way as on the smaller punches, although as yet, a great deal of the work is marked off.

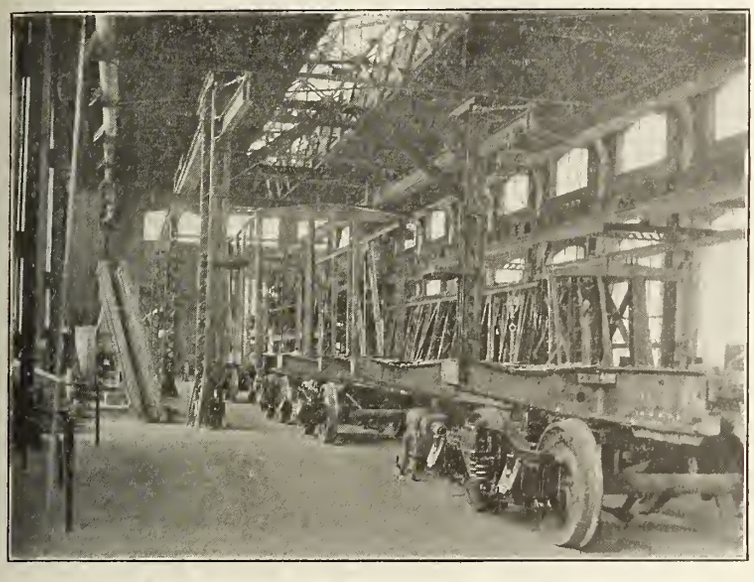


Fig. 13.—Erecting Side and End Frames on Steel Freight Cars.

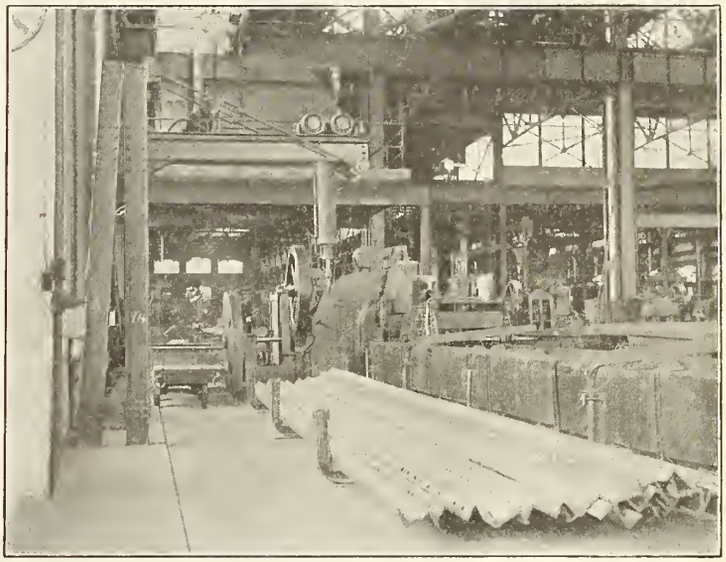


Fig. 14.—Punching Z Bars for Z Bar Centre Sills.

Instead of punching the side plates, they are drilled, for which purpose, a special type of machine has been designed and built in the company's shops. It is similar in construction to a locomotive frame slotting machine, the plates being laid out on a long table, to which they are bolted in piles, over top of which there is a travelling head with several electric drills, travelling on ways outside the machine table. Templates with hardened steel bushes are used for the drilling. Drilling the plates in piles makes the expense compare favorably with punching, while the holes are absolutely accurate, and the plates are not buckled. The long side members of the car are similarly drilled.

The several underframes as punched in the forward part of the shop, are brought to the assembling frame, shown in fig. 16, for final assembling. This assembling frame is similar in most particulars to the

Fig. 15.—General View of Passenger Car Fabricating Section.

Fig. 16.—Assembling Steel Passenger Car Underframes.

freight car assembling frame described earlier. In the floor, there are six Z bar sections embedded, to which are bolted in the desired location, depending on the kind of car under construction, cast iron columns, a row under the centre sill and a row under each side, all of the pedestals being located at the ends of the body bolsters and the cross bearers. The top of the pedestals carry bolted on castings, of a form to fit the part of the underframe that will be directly above. The parts are all perfectly aligned in this manner. Outside the outer row of cast iron pedestals, there is on each side, a row of steel columns, each row carrying a crane girder. Spanning the space over the underframe erecting stands, there are two electrically operated travelling cranes, which are used for handling the members during assembling, and also for handling the rivetting bulls.

From this assembling stand, the underframe is carried down into the passenger car erecting section, on one of the four tracks. The four cranes in these four bays, project into the inner 100 ft. bay, and make it convenient for the handling of the passenger car parts from the fabricating section to the erecting floor. Each of the four tracks will accommodate two passenger cars. The process of erection is very similar to that used in wooden passenger car work, the principal difference being that there is no fitting of the parts, all the members being machined to exact fit. Supported from the dividing columns, there are adjustable working platforms, from which the erecting work is conducted. On completion of the erection, the car is taken out through the back, and thence by way of the transfer table, to the old passenger car shop for final finishing.

We are indebted to R. W. Burnett, General Master Car Builder, for the permission to secure the data for this article, and to E. J. Harvey, Assistant Shop Engineer, for the detailed information obtained. We are also indebted to L. C. Ord, Assistant Master Car Builder, Eastern Lines, who recently read a paper describing the shop, before the Canadian Society of Civil Engineers, of which free use has been made.

The Canadian Pacific Railway's New Station at Vancouver.

The scheme for extensive improvements to the C. P. R. Vancouver terminals has been under way for upwards of two years, and will soon be nearing completion, as it is expected that the station will be ready for occupancy sometime this summer, and the steamship station facilities, adjoining the main station, somewhat earlier. Descriptions of the general scheme of the work appeared in Canadian Railway and Marine World for July and Aug., 1912, and April, 1913, the second article containing a plan of the whole terminal scheme as it will appear when completed.

The former passenger terminal, which was located at the foot of Granville St., near the shore line of Burrard Inlet, was built about 16 years ago, and, save for minor alterations, was unchanged from the original plan. By reason of its favorable location and good transportation facilities, Vancouver has grown to a city of about 125,000 in slightly under 30 years. The consequence was that the station facilities were considerably outgrown. In view also of the fact that the growth of the city's population would doubtless continue uninterrupted for many years, on account of it being based on advantages that will assure a steady advance, it was planned to build a station that will meet the reasonable requirements for some time to come.

The problem presented was materially different from that usually encountered, as while the traffic is quite heavy, there is a marked absence of suburban traffic. The aggregate number of trains is not large, and they are largely transcontinentals, and are long, frequently running in two and more sections, and carry a number of classes of traffic.

The general scheme embraces a passenger station and office building, situated on a stretch of available land to the east of the former station site. The former station level was 30 ft. above the tracks, and as it was desired to have the new station at the same level, the tracks have been raised 5 ft., making the new station level 25 ft. above them. There will be four passenger tracks in the present scheme, with provision for more when required, and they will be separated by wide platforms, between the station and the present freight yard. The four tracks will be covered by two sheds, 1,000 ft. long.

In order to avoid an inconvenient grade crossing and delays to traffic between the city and steamship wharf, because of the 1,000 ft. platforms extending beyond Granville St., a bridge on the line of that street is to pass over the passenger and freight tracks to the steamship pier, and connect directly with the passenger accommodations on the pier. An incline will also lead from the west side of the bridge to the wharf, giving access to the lower deck of the pier and freight sheds, and water front. This Granville St. viaduct will lead directly through the site of the former station, and, in consequence, will not be completed until some little time after the new station, due to the delay in tearing down the old structure.

Cordova St. Facade of C.P.R.'s New Station at Vancouver.

The main entrance to the passenger station will be from Cordova St., with the general waiting room central in the station, and at the street level. The station is a combination stone and brick structure, on a steel frame, divided into two principal levels, the main floor for waiting rooms and ticket offices, and the lower level floor for baggage, mail and express rooms. An upper floor will contain the company's divisional offices.

The building is of a triangular shape, with a frontage of 380 ft., a depth of 60 ft. at the Granville St. end, and about 130 ft. at the other end. The central frontage will consist of 10 columns, forming a porchway, in the centre of which, there will be three double swing doors, leading directly into the main waiting room, which will be 145 by 55 ft., with a lobby on either end, 45 by 30 ft. At the lower end of the west lobby, an entrance hall, containing two elevators and stairway, will lead up to the company offices upstairs. This hall may also be entered directly from the front porchway by a side door, which will be convenient in relieving the waiting rooms from those who are not travelling. A 15 ft. wide corridor will lead from the back end of the west lobby, through to Granville St., and near the street entrance, there will be three swing doors leading into the lunch room, which will be 35 by 60 ft. This room will contain a central lunch counter, with tables ranged around the walls. The restaurant service room, 30 by 20 ft., will adjoin to the east, and from this room, two elevators and a stairway will connect with the restaurant stores in the basement.

On the east side of the general waiting room, there will also be a lobby of the same size as that on the west, with a similarly situated corridor, leading from it into the plaza at that end. At the south end of this lobby, there will be a partitioned off section containing telephone and telegraph accommodation and cab call stand. The women's quarters will occupy the southeast corner of the building, and consist of a waiting room, 46 by 35 ft., entered from the east lobby, this waiting room connecting in turn through a lobby with a women's lavatory and retiring room, which will occupy the balance of that corner of the building.

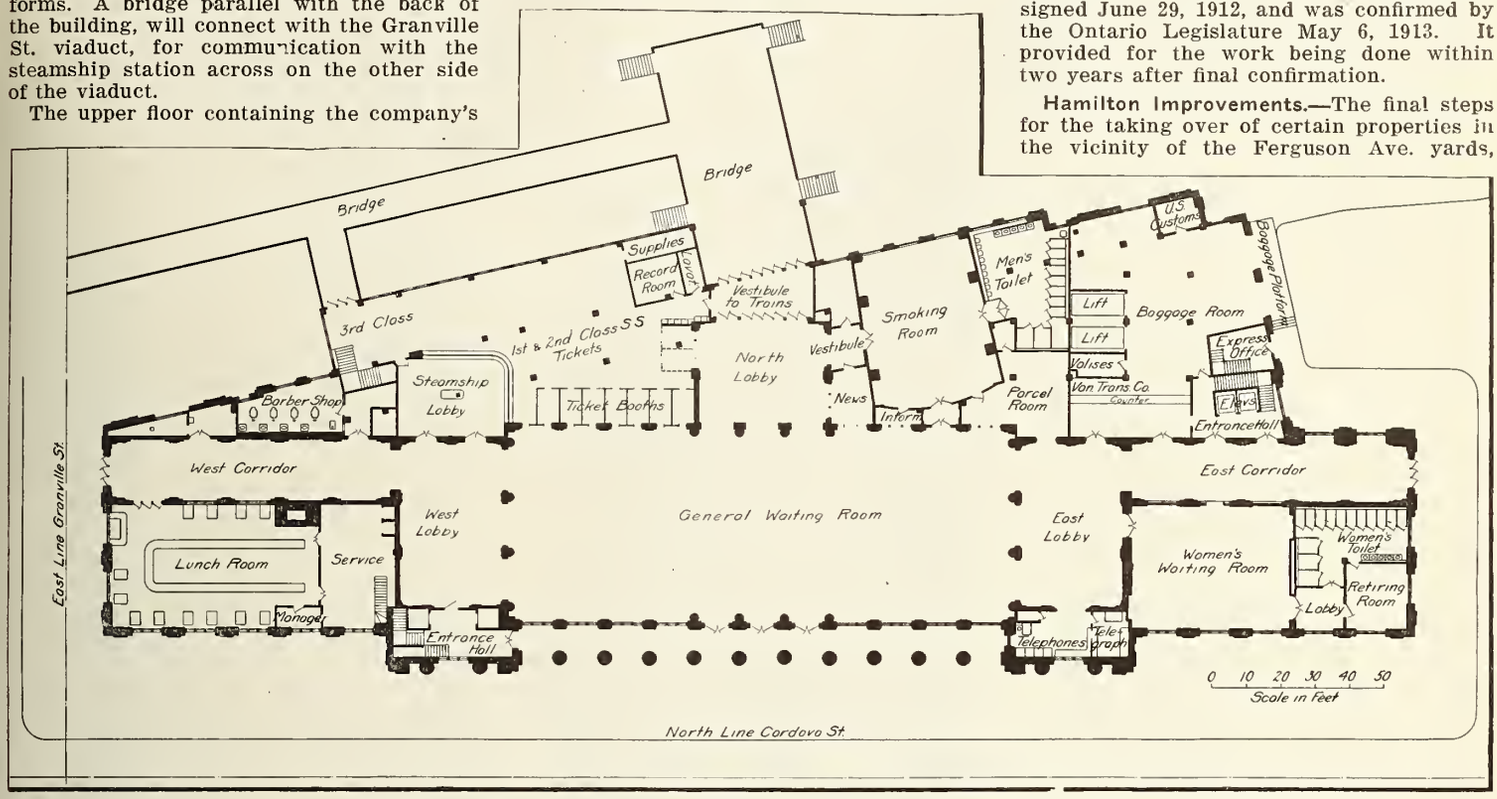
A north lobby will lead out from the centre of the main waiting room, through a doore on the east side of which the smoking room, 33 by 47 ft., will be entered. There will also be an entrance to this room through a vestibule from the east end of the general waiting room. The east side of the smoking room will connect through a vestibule with the men's lavatory. In one corner of the smoking room, will be the information booth and in another, the parcel room. The baggage receiving and delivering quarters will all be located in the northeast corner of the building, entered from the east corridor. In the baggage room will be two lifts for moving baggage in truck loads between the two levels, the main baggage room being below at the track level. An entrance hall from the east corridor, will contain two passenger elevators and stairway for communicating with the lower baggage room. Back of this entrance hall, in a corner of the baggage room, will be the express office, and in a back corner, the U. S. Customs office. The baggage will be brought into the building through the plaza at the east end and deposited on the baggage platform at that end.

On the west side of the north lobby will be the ticket booths, in a corner of the steamship accommodation. This latter will contain a lobby, and first, second and third class ticket booths. West of this, and con-

necting with the west corridor, will be a barber shop, boot blacking stand, and the janitor's room.

Through the north lobby, connection will be made by way of a train vestibule, with a bridge leading across the tracks, with stairs on either side leading down to the train platforms. A bridge parallel with the back of the building, will connect with the Granville St. viaduct, for communication with the steamship station across on the other side of the viaduct.

The upper floor containing the company's



Street Level Floor Plan of Canadian Pacific Railway's New Station at Vancouver.

divisional offices, will be divided on the unit system, each unit having complete heating and lighting facilities, with partitions that may be readily installed or removed as changes in the arrangement of the offices become necessary.

Canadian Pacific Ry. Station, Vancouver, Elevation on Track Side, showing Old Station on Right.

Barrott, Blackader and Webster, Montreal, are the achitects for the work, and Westinghouse, Church, Kerr and Co., New York and Montreal, are the engineers for the complete design, construction and equipment of the terminal, working in conjunction with C. P. R. officials.

Grand Trunk Railway Betterments, Construction, Etc.

Pembroke Station.—In pursuance of the company's policy of erecting new stations where such are necessary, a new station building and freight shed are being completed at Pembroke, Ont., at a cost of about $60,000. It is expected to be opened early in July.

Terminals at Prescott, Ont.—A recent press dispatch from Prescott, Ont., stated that preliminary operations had been started on the construction of the divisional terminals at that place; that sidings were being built to the site of the locomotive house and shops, so that building materials might be taken in ready for starting operations. We are officially advised that beyond the preliminary studies made some time ago no plans have been made and no preliminary work is in progress. Under the terms of the agreement with the town, the company is to expend not less than $150,000 on the buildings and to remove its terminals from Brockville to Prescott. The agreement was signed June 29, 1912, and was confirmed by the Ontario Legislature May 6, 1913. It provided for the work being done within two years after final confirmation.

Hamilton Improvements.—The final steps for the taking over of certain properties in the vicinity of the Ferguson Ave. yards, Hamilton, are being taken by the company. The amount involved in the purchase is about $110,000.

Signalling at Paris Jct.—This installation, which has been completed and put in operation, is purely a mechanical one, having annunciators in advance of the distant signals, for the purpose of annunciating the approach of trains, which is given by a train annunciator. All of the materials are according to R. S. A. standards.

The Galt-Elmira Branch.—The Mayor of Berlin, Ont., received a letter from Vice President Kelley, recently stating that after considering the estimates for the electrification of the Galt-Elmira branch, which amounted to $4,000 a mile, the management were of opinion that the traffic on the branch did not warrant the expenditure.

London Improvements.—C. G. Bowker, General Superintendent, is stated to have informed officers of the London, Ont., City Council, recently, that there was absolutely nothing new with regard to the projected track elevation. The city missed its opportunity when the company was elevating its tracks west of the city. Since that time, while the matter had not been lost sight of, nothing had been done. The extensive works in Toronto, and those under consideration at Montreal, would be completed before the question of track elevation in London was again considered. (April, pg. 174.)

Atlantic, Quebec and Western Ry.—400,000 acres of land granted by the Quebec Legislature in aid of the building of the line from New Carlisle to Gaspe, 100 miles, is reported to have been sold to the Chicoutimi Pulp Co.

The Rogers Pass Tunnel, Canadian Pacific Railway.

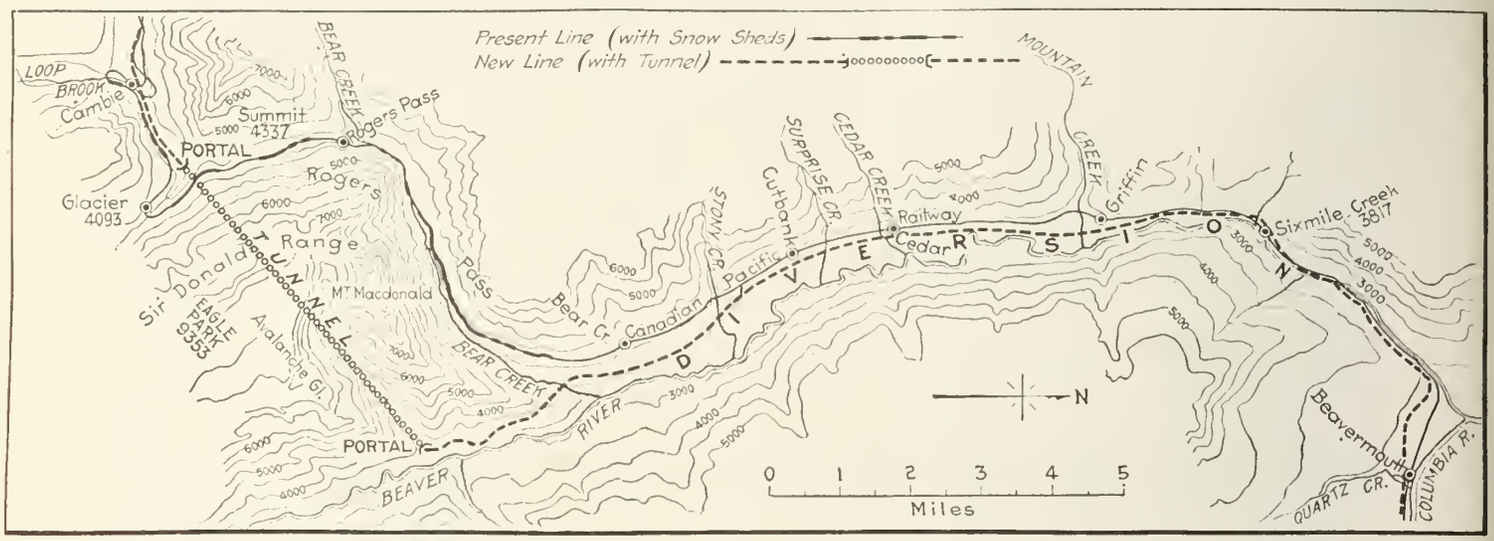
The C P. R. has undertaken a very important task to improve its main line where it crosses the summit of the Selkirk range in the famous Rogers Pass in British Columbia. An entirely new line is being constructed for 18 miles and its most notable feature is a 5 mile tunnel, under the summit of the pass, which will be, when completed, the longest railway tunnel in North America. That distinction, however, will pass shortly afterward, probably, to the Moffat tunnel under the continental divide, 50 miles west of Denver, Col., which is to be built jointly by the Denver & Salt Lake Ry. and the City of Denver, and will be nearly six miles long if built according to present plans.

The accompanying map and profile show the old and the new C. P. R. lines at Rogers Pass. The old line has long grades of 2.2% and reaches a summit elevation of 4,330.67 ft. in the pass, while the summit on the new line is 540 ft. lower. The new line will effect a saving of five miles in distance, and has the special advantage of eliminating a stretch of line subject to frequent troubles from snow and requiring long stretches of snowsheds. The present line has nearly five miles of snowsheds in 13 miles, while the new line will have only about 4,800 ft. The maximum grades on the new line are 2.2%, but their total length is less than one third of those on the old line. The total curvature is also reduced considerably and two loops are eliminated. It is proposed to use electric traction. Thus while the maximum train load will remain the same, the operating conditions will be very much more favorable in consequence of the lower elevation, the shortening of the heavy grades, and the reduction of the expense and delay due to snow. A comparison of the two lines is made in the following table:

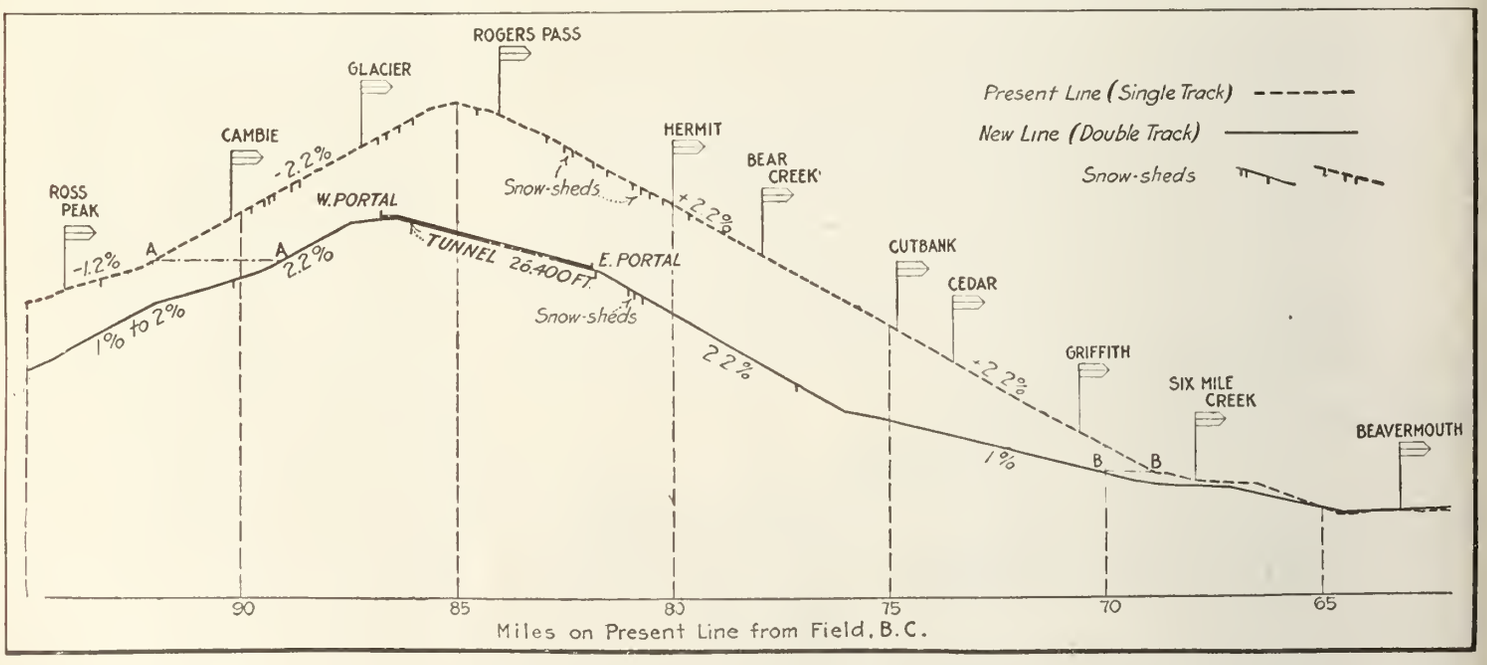
	Old line open summit.	New line summit tunnel.
Length, between same points	23 miles	18 miles
Max. grades (compensated)	2.2%	2.2%
Length of max. grades	22.15 miles	6.61 miles
Grade through tunnel (tangent)		0.98%
Summit elevation	4,330 ft.	3,791 ft.
Sharpest curves	10°	10°
Max. train load	870 tons	870 tons
Track	Single	Double

The tunnel will be 26,400 ft. long (exactly five miles), and all on tangent. It will have no intermediate shafts. For about 1,100 ft. at each end the material encountered will be clay and boulders. The balance is expected to be in solid rock, mica schist and quartzite, so far as can be judged from the investigations made. The maximum depth of rock above the tunnel will be 5,690 ft. In cross-section, the tunnel will be 24 ft. high and 29 ft. wide, with concrete lining through the softer materials.

The method of construction is unusual. A pioneer heading or tunnel is being driven 45 ft. from the centre line of the main tunnel and with its grade 10 ft. above the subgrade of the latter. From this pioneer tunnel crosscuts will be made to the line of the main tunnel at such distances as may prove desirable, probably 750 to 1,000 ft. apart. Drifts from these crosscuts will be driven along the centre line of the main tunnel, from which drilling and shooting can be



Revision of C.P.R. at Rogers Pass, with Double Track, Five Mile Tunnel.



Profiles of Old and New C.P.R. Lines at Rogers Pass.

At A-A and B-B the double track line will be on the same location as the present single track; the differences in distances indicate the saving by the new line.

carried on, while mucking will be done with air operated shovels in the enlarged section of the main tunnel. The muck will be handled by 16 yd. side dump cars and compressed air locomotives. The drills and ventilating fans will also be operated by compressed air.

By the middle of February the pioneer tunnel at the east end had been advanced 900 ft., and the right hand wall plate heading at the east portal had been started and carried 30 ft. The headings will be continued, timbering carried on and bench excavated by the air shovel until rock is encountered. Another steam shovel cut at the west end will enable the pioneer tunnel to be started at that end also.

The work is under the direction of J. G. Sullivan, Chief Engineer, Western Lines C. P. R. F. F. Busteed is engineer in charge, covering grade revision and double tracking as well as the tunnel. The contractors are Foley, Welch & Stewart, of Winnipeg, and A. C. Dennis is engineer in charge for them. Westinghouse Church Kerr & Co. have been retained as consulting engineers for the electric traction plans.—Engineering News.

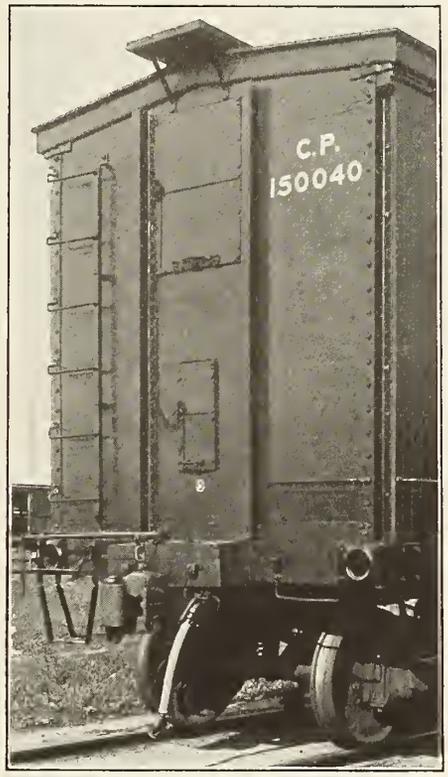
Instruction of Station Agents on Intercolonial Railway.

In connection with the general reorganization of the Canadian Government Railways system, James W. Barnett has been appointed Tariff Inspector and Assistant Weighing Inspector, for the I. R. C., with headquarters at Moncton, N. B. He will visit each station and report to the head office the condition in which the freight tariffs and circulars are kept. Tariff binders for filing tariffs will be supplied for all booking stations. All tariffs will be punched ready for filing in these binders before being distributed, and they are to be filed in them in the order shown in tariff index 9 and subsequent issues. He will carry with him a list of the tariffs issued to the different stations, and on his first visit will assist those agents who do not understand the system of filing, and after that, agents will be expected to file all tariffs in proper order when received, and if, on subsequent visits, this duty has been neglected, the Inspector will report the matter for such action as may be considered advisable. If additional copies of any tariffs are required by any of the agents for billing or checking purposes, application should be made to the Inspector for them, and they will be supplied, if in stock, but in any case, the book files must be kept complete and in order. The Inspector will be prepared to discuss with the agents any questions concerning the application of any tariffs in their possession about which they may be in doubt, thus affording them an opportunity of familiarizing themselves with the tariffs, and helping to minimize incorrect billing and the misrouting of traffic. Circulars are also to be filed in the tariff binders in the order shown in index of circulars 2. As Assistant Weighing Inspector, he will enquire particularly into the condition of the small scales at stations, and of the weighing of less than carload shipments.

Journal Brass.—Recent tests are said to have demonstrated that the M.C.B. journal brass is not the most satisfactory form for electric railway service, as the journal has a tendency to shift from under the brass under heavy brake application, and that great reductions in hot box troubles were effected by the use of a special brass of practically full semi circular cross section

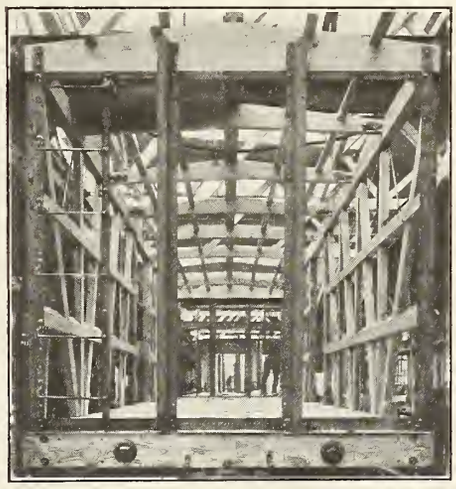
Reinforced Ends for Wooden Box Cars on the Canadian Pacific Railway.

The weakest point in the superstructure of the wooden box car, with the possible exception of the wooden roof, is the car end, where the shifting of the lading frequently has an injurious effect in damaging the end. This is particularly true of the



Reinforced End Wooden Box Car, C.P.R.

former construction, in which the end framing was identically the same as that in the sides, although the stresses in service on the ends of the car are much in excess of those in the sides, from the before mentioned cause.



Details of End Framing on Wooden Box Cars, C.P.R.

The wooden car end construction recently evolved on the C.P.R. is shown herewith. The corner posts consist of Z bars, with two intermediate Z bars for end posts, these four being tied together with a Z bar on top and an angle on the bottom. The bottom angle is bolted to the end sill and rivetted to the steel centre sills. The top Z bar is securely attached to the end plate. The end sheathing is horizontal, and consists of 1¾ in. tongued and grooved lumber. This is secured to the vertical end Z bars by bolts.

This construction very closely resembles the framing arrangement on the steel frame car, of which the C. P. R. has such a large number. It makes a very solid end arrangement, and one that is not easily damaged in the event of the lading shifting in transit.

We are indebted to R. W. Burnett, General Master Car Builder, C.P.R., for the data on which this article is based.

Inverness Railway and Coal Company's Annual Report.

The report presented at the annual meeting in Toronto recently, over the signature of Sir Wm. Mackenzie, President, covers the two years to June 30, 1913. Following are extracts:—

The results of operations of the colliery were:—

	Year ended June 30, 1913	Year ended June 30 1912	Year ended June 30, 1911
Output (tons)	278,197	295,789	295,899
Gross earnings	$545,702.87	$536,312.35	$543,711.76
Operating expenses	546,562.35	529,030.40	532,866.42
Net earnings	x859.48	7,281 95	10,845.34

And those of the railway were:—

Gross earnings	$213,824.00	$200 704.20	$207,229.98
Operating expenses	120,439.31	111,291.72	114,040.71
Net earnings	93,384.69	89,412.48	93,189.27

x Deficit.

The result of operations for the two years is a net revenue of $170,747.18 towards the payment of interest and other charges amounting to $423,512.25, or a deficit in the operations for the two years of $252,765.27. The underground workings of the mines have, as usual, been regularly inspected by the Government inspector and are in good condition. The physical condition of the railway is being fully maintained.

INCOME ACCOUNT.

Balance at June 30, 1911			$725,659.27
INTEREST ON BONDS, &c.—			
First mortgage bonds	$213,100.00		
Bank advances	141,877.15		
Sundry creditors	54,922 51		
Interest account to June 30, 1912, and June 30, 1913	$38,722.90		
Less accrued at June 30, 1911, and June 30, 1912, paid during 1912 and 1913	38,722.90		
		$409,899.66	
Hire of equipment		13,612.59	
			423,512.
			$1,149,171.52
NET EARNINGS—			
Colliery—Gross earnings	$1,082,015.22		
Operating expenses	1,075 592.75		
		$6,422.47	
Railway—Gross earnings	$414,528.20		
Operating expenses	231,731.03		
		182,797.17	
Operation boats, &c.—			
S.S. Renwick	$ 598.58x		
S.S. Kilkeel	8,971.96x		
Port Hastings pier	8,543.46x		
Inverness B—1	344.96x		
		18,458.96x	
Miscellaneous earnings (debit balance)		13.50	
			170,747.18
			$978,424.34

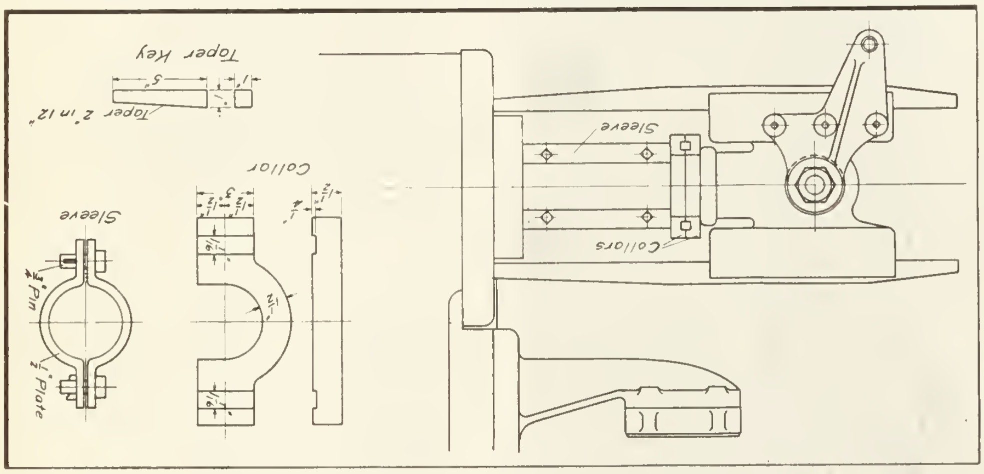
x Deficit.

Canadian Northern Prairie Lands Co.—The financial statement for the year ended Dec. 31, 1913, shows net income from investments, loans, sales of land, etc., of $194,496, out of which two dividends of 6% each, making 12% for the year, have been paid, leaving a balance of $14,496. The deficit on land sales for the year was $2,660, so that the net balance carried forward was $11,826. In 1912, the net income was $232,094, and the balance carried forward was $52,994.

Railway Mechanical Methods and Devices.

Piston Extractor on Canadian Northern Railway.

A piston rod extractor of unusual strength, and one that will draw pistons without damaging the crosshead in any way, is shown in the accompanying illustration. A sleeve, formed from ½ in. boiler plate, in two parts, each in the shape of a bearing



C. N. R. Piston Rod Extractor.

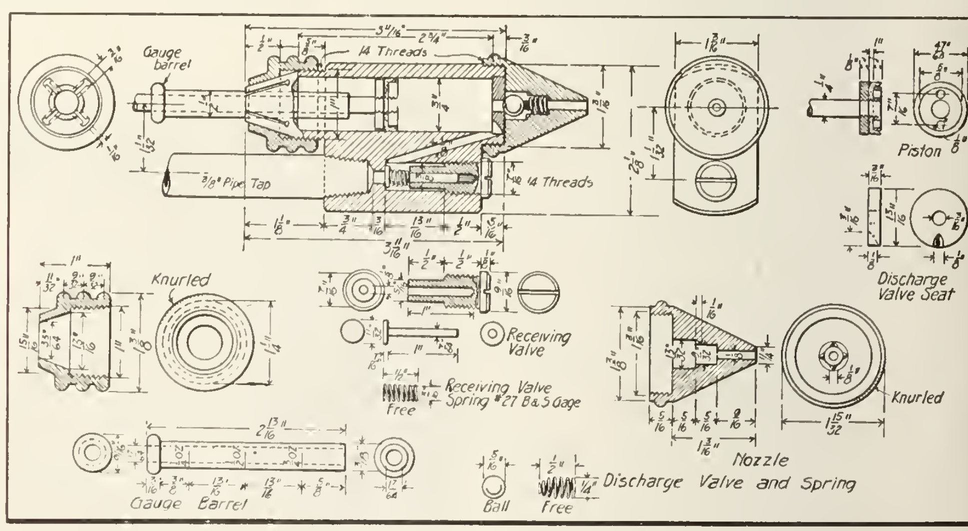
cap, fit around the piston rod, and is held together by four ⅝ in. pin bolts, although ordinary bolts would be equally satisfactory, though not as quick to apply. This two part sleeve is made long enough to extend from the packing gland to within 3 ins. of the back of the crosshead when the latter is in its rearward striking position.

In this 3 in. space, there are placed two collars of the form shown, each 1½ in. thick. In the mating surface, there is cut a half keyway in each. Taper keys are driven in the bays between the collars, the piston rod being thereby drawn from the piston without any damage to the locomotive working parts. This method of extracting piston rods has been adopted as standard on the C. N. R. system.

Centre Plate Oiler.

It has been believed by a great many, that a large proportion of the derailments which cannot otherwise be satisfactorily explained, have been caused by excessive friction in the centre plates of box cars. The Denver and Rio Grande Rd. took up the practice of oiling its centre plates, and a noticeable improvement has been effected in keeping the freight car trucks on the rails, and it is the opinion that this may be attributed to the use of oil. A cheap grade of summer black oil, costing 11 cts. per gal., is used, and ¼ oz, is sufficient for a narrow gauge centre plate.

When this system of oiling was first introduced, a helper was detailed to go all over the yard, oiling all centre plates with a long spout oil can, which proved very wasteful of oil, and had, in addition, the more serious disadvantage of placing the oiler in a very precarious position, as he was compelled to go under the narrow gauge cars to get at the centre plate. An average of only 30 cars per gal. was the best possible result obtainable with this method. A different type of oiler was developed, by which the number of cars per gallon was increased to 60, or slightly more than ¼ gill per centre sill. This arrangement consists of an oil can with an unusually long spout, on the outer end of which is the discharge valve shown in the accompanying illustration. The plunger in the small cylinder is connected to a long rod that runs back alongside the spout to the can, and which can be operated at that point by the oiler. The forward movement of the plunger discharges oil on the centre plate. Drawing the plunger back causes the discharge valve to seat, and the receiving valve to open, filling the chamber again with oil. A half gallon can with this valve arrangement attached at the outer end of a 4 ft. pipe, is light enough to be handled with facility, and reduces the time of oiling by three quarters. It also saves the oiler, as all the work can be performed from outside the trucks. The plain oiler proved such a success that, as the line handles both narrow and standard gauge cars, a graduated oiler was made, as some of the narrow gauge cars do not require as much oil as the standard. This information is from an article in the Railway Master Mechanic.



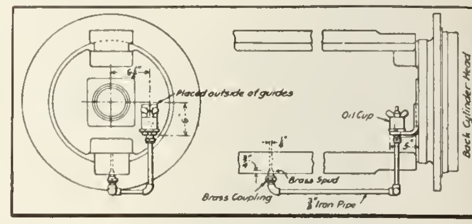
Centre Plate Oiler Discharge Valve Details.

Pere Marquette Rd.—Application is being made to the U. S. courts at Detroit, Mich., by the receivers of the company, for authority to issue $12,000,000 of receivers certificates. This application has nothiag to do with the foreclosure suits against the company, filed by the Farmers' Loan and Trust Co., New York, Mar. 30.

Lubricating Bottom Guide Bars.

To overcome the usual difficulty in lubricating the bottom guide on locomotives of the two bar guide type, the Baltimore and Ohio Rd. makes use of the arrangement shown herewith. This overcomes any trouble, and places the oil on the guide where required, that is, at the centre.

The oil cup is supported on a small wrought iron bracket fastened to the back cylinder head, the feed pipe from the lubricator passing down alongside the guide to its underside, a connection being made along the latter to its centre, where the



Oil Cup and Connections for Lubricating Bottom Guide Bar.

pipe taps into the guide. The lubricator is placed at a higher elevation than the guide, so that the surface is gravity fed. The lubricator cup should be of the regulated feed type. The foregoing information is abstracted from an article in the Railway Age Gazette, mechanical edition.

Valve Setting Machine on the Canadian Northern Railway.

The parts for a valve setting machine, which varies to a degree from the type commonly found in railway shops, is shown in the accompanying illustration. It is used for revolving the main locomotive driving wheel for adjusting the valve during setting, and this particular mechanism represents standard practice on the C. N. R. system.

The four bed plates are of cast iron, carrying roller trunnions cast integral with the bed plate. The bottom face has a groove machined out ⅜ in. deep by 2½ ins. wide, to fit over the top of the rail. They are designed to accommodate a maximum width of tire of 6 ins. Each bed plate carries a roller 7¼ ins. in diameter, three of which

are of cast iron, chilled on the surface, and with the corners rounded off to a 11-16 in. radius to fit snugly against the tread and flange of the driving wheel. The fourth, or driving roller, is of open hearth steel, with the face cut with 91 teeth, 3-16 in. deep, and ¼ in. circular pitch, the roller being case hardened.

The smooth faced rollers work on case hardened steel roller bearings, ⅜ in. diameter by 2⅛ ins. long, held in place by double collars, of case hardened steel, 1-16 in. thick. The toothed roller is keyed to the main operating shaft, which operates in bearings in the main bed plate. The three smooth rollers work independently in their respective trunnions, and each carries a small case hardened steel axle, 2 3-16 ins. diam. by 7 15-32 ins. long, the ends of which are tapped for ½ in. machine screws, a washer 3½ ins. diameter and ⅜ in. thick on each end, holding the shaft in place. The pairs of bed plates, that is the pairs on each side, are secured together by 1 in. tie rods, two on each side of the locomotive.

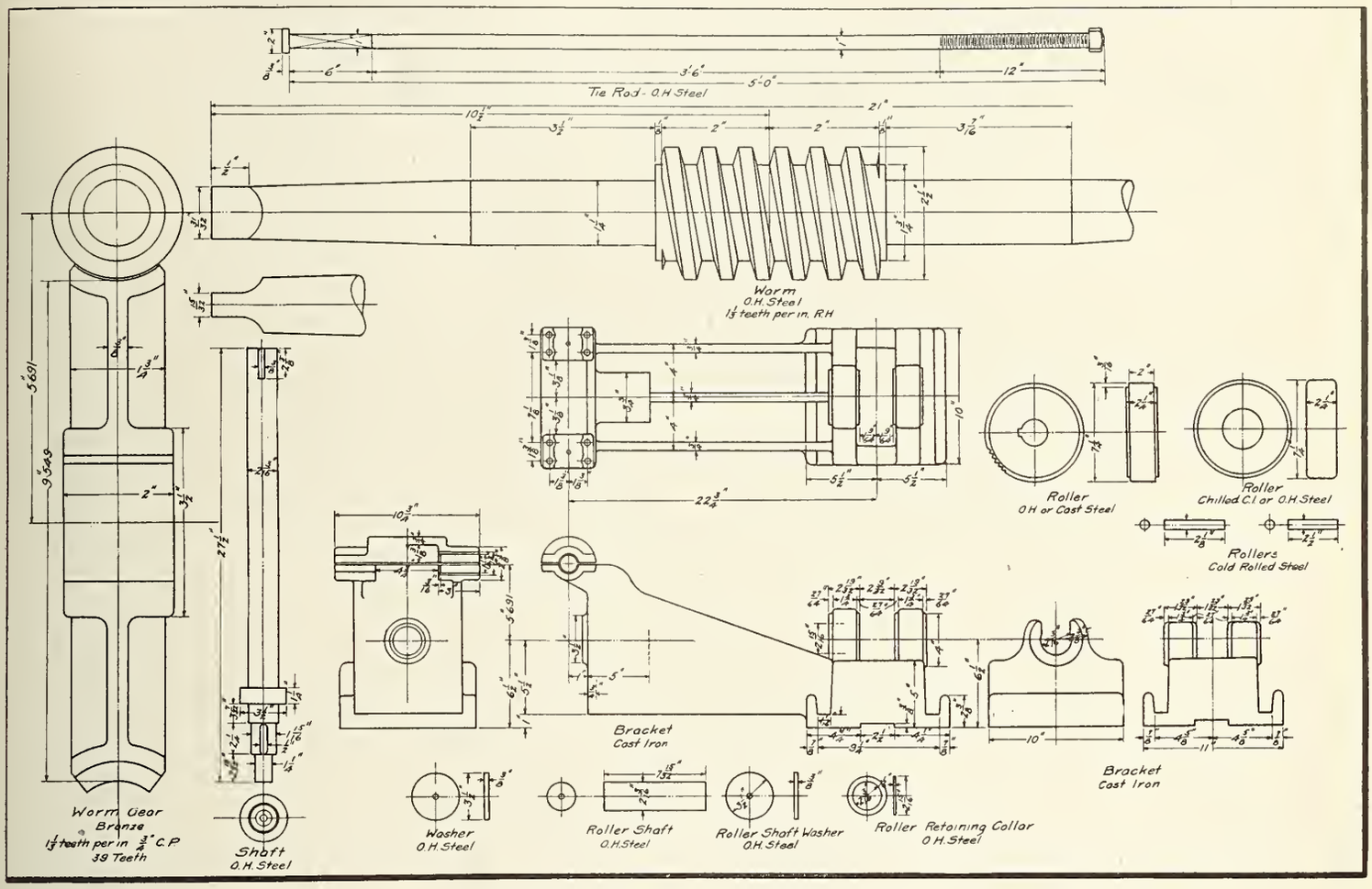
A bronze worm gear, 9.549 ins. diam., 1 1-3 teeth per in., ¾ in. circular pitch, making a total of 39 teeth per gear, is keyed to the other end of the toothed wheel shaft, close against the bearing. This worm gear engages with a worm, 4¼ ins. long, 2½ ins. outside diameter, with six teeth, 1 1-3 teeth per in., right hand, which is carried in bearings on the back of the main bed plate. The worm shaft has a taper shank, no. 4 Morse, which carries an air motor. A cast worm might be used if a machined one was not to hand.

The advantage claimed for this arrangement is that the operating mechanism is off to one side and in plain view of the operator. The arrangement is simply installed, as the only adjusting required is in the rods, which are fitted up to suit the diameter of the wheel.

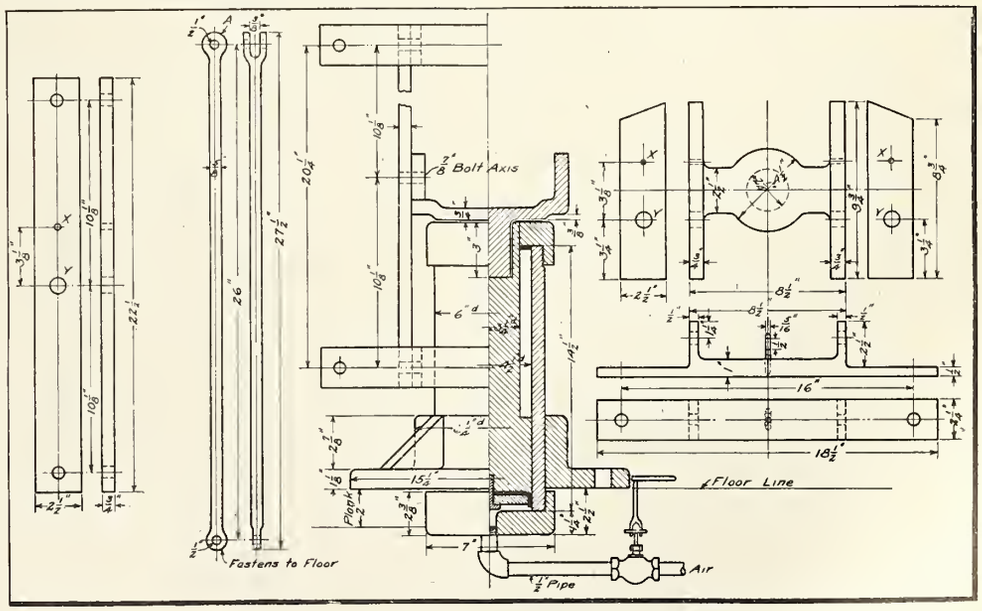
The Outlook recently published an authorized interview with Sir Thomas Shaughnessy on the question of railways and the people, in which he gave a summary of the case for and against Government ownership.

Air Pump Repair Stand on Canadian Northern Railway.

The accompanying illustration shows an air pump repair stand used on the C.N.R., the device being so arranged as to facilitate work on the pump, bringing all parts of the latter within easy working range.



Valve Setting Mechanism with Component Parts.



Air Pump Stand for Convenient Handling of Repairs.

A quick method of finding the approximate area of pipe is to square the diameter and take three-quarters of the result.

Pivotted on a ⅞ in. pin through the U head of a vertical air cylinder, there is an air pump bracket, with four holes by means

of which the pump is secured. The vertical air cylinder is let into the ground, with the air connection through the lower end, controlled by a small air globe valve. The ⅝ in. rod shown is attached at one end to the bracket, and at the other end to the floor.

Turning on the air causes the piston and bracket to rise, the restraining action of the rod to the floor causing the bracket to revolve into a horizontal position. Through the U of the piston head and the arm of the bracket there is a pin hole, X, through which a pin is inserted, holding the pump in a horizontal position. The tilting rod may then be removed, and the pump raised or lowered into the desired position for working. Not only does this arrangement permit of the pump being placed in any desired elevation for working, but it may be swung around as desired to convenience.

Telegraph Statistics for Year Ended June 30, 1913.

The capitalization of telegraph companies operating in Canada for the year ended June 30, 1913, as reported by the companies, was $202,468,041.32, of which $160,342,873.32 was in stocks and $42,125,168 in funded debt, these figures being practically the same as in the previous year. There is no capital liability attached to the C. P. R., Timiskaming and Northern Ontario Ry. and Dominion Government telegraph services. The total number, 2,885 were operators, 2,693 males and 192 females. The salaries and wages were $2,962,159.13 against $2,703,032.09; the total salaries and wages for 1912-13 being equal to 73.4% of the operating expenses, compared with 76.7% in the previous year.

Company	Capital Stock	Funded Debt	Cost of Real Property and Equipment	Revenue from Operation	Operating Expenses	Net Operating Revenue	Pole Mileage		Wire Mileage				
							Operated by Company	Operated by other Company	Galvanized	Copper			Multiple
										Overhead	Under.	Subm.	
Anglo-American Telegraph	$34,066,666.66		$ 34,066,666.66										
American Telegraph and Cable	14,000,000.00												
Canadian Northern Telegraph	500,000.00	$ 800,000.00		$ 276,739.70	$ 141,742.68	$ 134,997.02	5,013.10		16 343 50				
C.P.R			6,696,421.40	3,286,508.95	1,691,953.38	1,594,555.57	12,826.00	820.00	45,821.00	24,122.00	448.00	155 00	x 36,233.00
Direct U.S. Cable	5,909,106.66		5,909,106.66										
Dominion Government			2,211,950.00	215,526.11	491,550.80		9,335.50		9,514.00	346.00		277.00	
G. T. Pacific Telegraph	100,000.00			72,126.80	62,236.13	9,890.67	2,474.00		5,874.75	2,908.50			
G.N.W. Telegraph	500,000.00			1,244,302.67	911,884.98	332,417.69	9,409.00		27.101.00	2,036.00	250 00	131.00	3.340.00
Halifax and Bermuda Cable	250,000.00		757,740.00	69,710.00	25,695.00	44,015.00							
Marconi Wireless Telegraph	5,000,000.00			218,660.00	218,597.00	63.00							
North American Telegraph	200,000.00		51,666.47	22,023.49	21,084.55	939 94	44.00		783.50				
Pacific Cable Board		8,723,168.00	55,000.00	85,166.60	69,649.69	16,516.91							
T. & N. O. Ry			33,034.49	36,297.73	12,495.34	23,802.39	297.00		862.00				
Western Union Telegraph	99,817,100.00	32,602,000.00	136,125,768.07	568,150.85	387,590.88	180,559.97	2,829.89		15,868.01	4.77		72.96	22..51
Totals	$160,342,873 32	$42,125,168.00	$185,907,353.75	$6,095,212.90	$4,034,480.43	$2,337,757.16	42,228.49	$20.00	122,167.76	29,417.27	698.00	635.96	39,703.51

x Not included in wire mileage.

cost of real property and equipment was returned at $185,907,353.75, an increase of $1,757,676.75 over the amount for the previous year. The total revenue from operation was $6,095,212.90, an increase of $879,041.98; while the operating expenses were $4,034,480.43; the net operating earnings being $2,060,732.47. The ratio of operating expenses to gross revenue was 66.84 as compared with 65.83 for the year 1911-12. The pole mileage for the year was 43,048.49 miles, and the wire mileage, 152,918.99 miles, against 40,785 pole mileage, and 167,939 wire mileage, reported for the previous year. In this connection the decrease in the total of wire mileage reported for the year 1912-13, is due to the improper exaggeration of the total reported for the previous year, one company reporting one mile of quadruplex mileage as four miles. There appeared to be a general misunderstanding in the reporting of multiple wire mileage as double or four times the single wire mileage, instead of as single wire mileage.

The number of land messages transmitted was 11,176,753 against 9,252,540 in the previous year. Cablegrams sent were 877,534 against 768,559. In order to make a proper comparison of the cablegrams, the number of words should be given, and an effort is being made to have this done in future reports.

The number of employes reported was 6,006 against 4,828 in 1911-12. Of the first

Dominion Government Railway to Hudson Bay.

The acting Minister of Railways in the course of a statement presenting the annual report of the department to the House of Commons recently said the mileage of the line from Pas, Man., to Port Nelson is 418 miles; the whole line is under contract to J. D. McArthur & Co. The work on the terminals is being carried on by day labor under the Department. Steel has been laid to about mile 90. Grading is practically completed to mile 130, and the work is well manned to about mile 240, where the first crossing of the Nelson River occurs, which involves a span of over 400 ft. Between this first crossing of the Nelson at Manitou Rapids, and the second crossing near Kettle Rapids, about 90 miles, the contractors have been equipping their camps, and getting in supplies to enable them to proceed with grading during the year. The progress being made is more satisfactory than hitherto, and gives reason for hope that the line will be completed to Port Nelson in 1916.

At Port Nelson buildings and warehouses for the working forces had been erected, and also a wireless telegraph station which is in communication with Ottawa, through the wireless station erected by the Department at Pas. A fair amount of plant, including a large suction dredge, is ready for operation on the work there. Ties and lumber are being got out for the work. By the opening of navigation the temporary wharf will have been extended so as to adequately deal with the 20,000 tons of freight which will be shipped in during this year. The Department has under construction three small steamboats for lighters, so that no further difficulty in the way of handling freight is expected.

The choice of Port Nelson was made after very careful investigation, and not until after a consideration of the very exhaustive report prepared by H. T. Hazen, who was sent in at the opening of navigation in 1912, and who did not come out until late in the winter. It will be necessary, of course, to supply aids to navigation so that vessels may be able to locate the proper channel. In a new port this is to be expected, and when the wireless station at Nelson is augmented by one in the Straits, much of the difficulty of navigating the Straits and the bay will be overcome.

The Dominion Parliament has voted $750,000 on account of the construction of railway terminals and elevators. (April, pg. 175.)

Ocean Railway Terminal Facilities at St. John and Halifax.

The new ocean terminal facilities at St. John, N.B., are being laid out by the Department of Public Works, and the principal extension of the railway terminal facilities is being carried out by the C.P.R. The whole of the works for the railway and steamship terminals at Halifax are being carried out by the Department of Railways. In the House of Commons recently the acting Minister of Railways said the following contracts had been let in connection with this work. Sect. 1:—From Rockingham to Jubilee House, 3.5 miles, to the Cook Construction Co. and Andrew Wheaton. This contract is for constructing a railway which it is estimated will cost when completed, $407,995. Sec. 2:—From Jubilee House to Reid Rock, Halifax Harbor, about four miles. The Cook Construction Co. and Andrew Wheaton were awarded the contract for the construction of a railway which it is estimated will cost $1,035,160. In addition to this railway a contract was let for the construction of about 6,500 lineal feet of quay walls, foundations for building, sewers, dredging of harbor to a depth of 45 ft. at low water, and filling reclaimed area to Foley Brothers, Welch, Stewart and Fauquier. The work is estimated to cost $5,208,743. On the first two contracts about 30% of the grading, ditching and culverts from Fairview to Quinpool has been completed. On the third contract very little has been done. The contractors are busy getting plant ready, and the work will be pushed ahead as fast as possible. The Government believes that when these terminals are complete Halifax will have a harbor equal to any other port in the world, with a capacity sufficient to handle the traffic which is expected to go through the port. Work has also been in progress for some time at Halifax on pier 2. It is nearing completion and was partly used during the winter to relieve the congestion. It is estimated that the expenditure for the current year will be $240,000. The total cost of the work is estimated at $800,000.

Full descriptions of these works, with an illustration, were given in Canadian Railway and Marine World in 1913, Sept., pg. 421, Oct., pg. 462, and Nov., pg. 535.

Railway Lands Patented. Letters patent were issued during March, in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:

	Acres.
Calgary and Edmonton Ry.	4,777.67
Canadian Northern Alberta Ry.	1.77
Canadian Northern Branch Lines Co.	2.80
Canadian Northern Ry.	480,00
Canadian Pacific Ry. grants	71.12
Canadian Pacific Ry. roadbed and station grounds	.82
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	2,943.10
Total	8,277.28

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

21533. Mar. 23.—Approving Essex Terminal Ry. deviation as built from near Bedford St., Sandwich, Ont., to Detroit River.

21534. Mar. 24.—Amending order 21382, Dec. 12, 1913, re Canadian Northern highway crossings on its Alsask Southeasterly line.

21535. Mar. 24.—Authorizing C.P.R. to connect with Mond Nickel Co.'s spur at mileage 103.25, Sudbury District, Ont.

21536. Mar. 24.—Authorizing G.T.R. to use 57 bridges.

21537. Mar. 23.—Authorizing G.T.R. to build bridges, 29, over Grand River, near Paris; and 21, over its Brantford and Tillsonburg line, near Brantford, Ont.

21538, 21539. Mar. 24, 23.—Authorizing G.T.R. to build bridge 257, District 13, Milton, and 5 bridges, District 12, Ont.

21540. Mar. 23.—Authorizing G.T.R. to build siding for Pelleyrino Del Sole, St. Bruno Parish, Que.

21541. Mar. 25.—Suspending tariffs and supplements applicable to international traffic, filed by G.T.R., M.C.R., Wabash Rd., C.P.R., and P.M.R., pending hearing, to be fixed by Board, for companies to justify removal of Essex Terminal Ry. from joint tariffs.

21542. Mar. 4.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to widen its right of way for transmission line to 125 ft. in St. Ignace du Coteau du Lac and St. Polycarpe Parishes, Que.

21543. Mar. 19.—Authorizing G.T.R. to expropriate lands between Yonge and Cherry Sts., Toronto.

21544. Mar. 24.—Approving clearance at G.T.R. turntable at St. Thomas, Ont.

21545. Mar. 24.—Authorizing G.T.R. to rebuild bridge 328, across Vanstone's Pond, mileage 143.14, near Lansdowne, Ont.

21546. Mar. 23.—Approving revised location of G.T. Pacific Branch Lines Co.'s Regina-Moose Jaw Branch, mileage 2.10 to 3.11, Regina District, Sask.

21547. Mar. 25.—Authorizing G.T.R. to operate over interlocking plant at Paris Jct., Ont., without first stopping trains.

21548. Mar. 23.—Approving location of C.P.R. station at Denhart, Alta.

21549. Mar. 24.—Ordering G.T.R. to submit for approval, a plan showing new station at Summerstown, Ont., providing for accommodation for receiving, loading, unloading and delivering traffic offered there, station to be completed with facilities by July 1.

21550. Mar. 24.—Authorizing City of Fort William, Ont., to build highway crossing over G.T. Pacific Ry. where Stanley Ave. would intersect same.

21551. Mar. 24.—Ordering C.P.R. to reappoint station agent at Beverly, Sask.

21552. Mar. 25.—Authorizing Saskatchewan Board of Highway Commissioners to build highway crossing over Canadian Northern Ry. at west end of station grounds, Forgan, Sask.

21553. Mar. 21.—Amending order 21332, Feb. 4, re taking of certain lands in Bathurst Tp., Ont., by C.P.R.

21554. Mar. 24.—Authorizing C.P.R. to build spur for City of Moose Jaw, Sask.

21555. Mar. 26.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to widen its right of way for transmission line in St. Joseph de Soulanges Parish, Que.

21556. Mar. 24.—Authorizing C.P.R. to build road diversion at mileage 100.3, McAuley Subdivision, Sask.

21557. Mar. 25.—Authorizing Niagara, St. Catharines and Toronto Ry. to build siding for the Electric Steel and Metals Co., Welland, Ont.

21558. Mar. 26.—Authorizing Toronto, Hamilton and Buffalo Ry. to build temporary spur for Dominion Power and Transmission Co., Hamilton, Ont.

21559. Mar. 27.—Extending to Mar. 27, 1915, time within which Campbellford, Lake Ontario and Western Ry. (C.P.R.) may use crossing of C.N. Ontario Ry. at mileage 0.35.

21560. Mar. 26.—Dismissing application of Town of Forward, Sask., for order directing C.P.R. to move its station. Ordering C.P.R. to build spur at Forward, Sask., by June 1.

21561. Mar. 31.—Allowing correction of book of reference endorsed on C.P.R. plan of June 24, 1911, to show H. L. Auger as owner of certain portions of lands instead of C.P.R.

21562. Mar. 27.—Authorizing C.P.R. to build extension to spur for Hyde and Sons, Outremont, Que.

21563. Mar. 27.—Authorizing G.T.R. to build siding from south of Allanburg station, Ont., southwesterly along Water St.

21564. Mar. 30.—Authorizing Saskatchewan Board of Highway Commissioners to build highway over Canadian Northern Ry. in n.e. ¼ Sec. 8-48-25.

21565. Mar. 27.—Authorizing G.T.R. to build siding for Canadian Buffalo Forge Co., Berlin, Ont.

21566. Apr. 1.—Approving Montreal and Southern Counties Ry. Standard Freight Tariff C.R.C. 1, to become effective Apr. 13.

21567. Mar. 31.—Authorizing Cedar Rapids Mfg. and Power Co. to take additional 25.8 ft. of land from J. Bissonnette, St. Joseph de Soulanges, Que., for its transmission line.

21568. Apr. 1.—Authorizing Lake Erie and Northern Ry. to build bridge across Lynn Pond and Lynn River, Simcoe, Ont.

21569. Mar. 31.—Authorizing C.P.R. to build bridge 19.86 across Richelieu St., St. Johns, Que.

21570. Mar. 30.—Authorizing C.P.R. to build spur for International Linseed Oil Co., Moose Jaw, Sask.

21571. Mar. 30.—Authorizing Canadian Northern Ry. to build extension of spur to gravel pit, Lot 45, McIrvine Tp., Ont., and to cross Government colonization road and Rainy River road.

21572. Mar. 31.—Approving location of C.P.R. station at Schepler, mileage 51.4, Port McNicoll Subdivision, Ont.

21573. Mar. 28.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands for access to station grounds in Oshawa, Ont.

21574, 21575. Mar. 30.—Authorizing Cedar Rapids Mfg. and Power Co. to take additional 28.9 ft. for transmission line, across Lot 142, and 25 ft., across Lots 309, 310, and Lot 14, St. Joseph de Soulanges Parish, Que.

21576. Apr. 1.—Authorizing Midland Ry. of Manitoba to lay pipes under C.P.R., between Erin and Clifton Sts., Winnipeg.

21577. Mar. 31.—Approving location and design of G.T.R. new station at Ekfrid, Ont.

21578. Mar. 31.—Ordering G.T.R. to install improved type of automatic bell at first public highway west of South Indian station, Ont.

21579. Apr. 1.—Relieving G.T.R. from providing further protection at crossing of second highway east of Carlsbad Springs, Ont.

21580. Apr. 2.—Authorizing C.P.R. to rebuild bridges 24, over Irish Creek, near Jasper, Ont., and 2.9, over Three Tree Creek, near Fredericton Jct., N.B.

21581. Apr. 2.—Authorizing Cedar Rapids Mfg. and Power Co. to take additional 25 ft. across Lots 125, 123, and 129, St. Ignace du Coteau du Lac Parish, Que.

21582. Apr. 2.—Approving location of C.P.R. station at Spillimacheen, B.C., mileage 40.93, Kootenay Central Ry.

21583. Apr. 2.—Ordering Bank of Montreal, New Westminster branch, to pay to Great Northern Ry. or order, $1,222.50 deposited by Delta Shingle Co. to Board's order under order 18508, Jan. 14, 1913, re spur near Townsend station, B.C.

21584. Apr. 3.—Authorizing C.P.R. to build spur for Fernie-Fort Steel Brewing Co., Fernie, B.C.

21585. Apr. 2.—Authorizing C.P.R. to use Red River Bridge, Winnipeg Terminals; and bridges 0.41, Fort William Terminals, Ont.; 131.3, Brandon Subdivision, and 63.3, Lac du Bonnet Subdivision, Man.

21586. Apr. 2.—Authorizing C.P.R. to build spurs for Manley and Slater Automobile Co., and Canadian Standard Automobile and Tractor Co., Moose Jaw, Sask.

21587. Apr. 3.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spurs for Hamilton Bridge Co., Hamilton, Ont.

21588. Apr. 3.—Approving C.N. Quebec Ry. plan of proposed arrangement of signals at crossing of C.P.R. at L'Epiphanie.

21589. Apr. 3.—Authorizing Pointe aux Trembles Terminal Ry. to build across Notre Dame St. East, Montreal Island.

21590. Apr. 3.—Suspending C.P.R. Tariff, C.R.C. no. E. 2765, and G.T.R. Tariff, C.R.C. no. E. 2896, covering proposed new rules governing milling-in-transit of grain, pending investigation by Board.

21591. Apr. 4.—Amending order 21558, Mar. 26, re Toronto, Hamilton and Buffalo Ry. spur for Dominion Power and Transmission Co., Hamilton, Ont.

21592. Apr. 3.—Authorizing Pointe aux Trembles Terminal Ry. to build across C.N. Quebec Ry., Pointe aux Trembles Parish.

21593. Apr. 2.—Authorizing the G.T.R. to build 28 bridges at various points in Ontario.

21594. Apr. 2.—Ordering G.T.R. to flag all trains over crossing of Bridge St., Niagara Falls, Ont.

21595. Apr. 2.—Relieving G.T.R. from providing further protection at the crossing of Light St., Woodstock, Ont.

21596. Apr. 4.—Authorizing C.N. Alberta Ry. to build across and divert north and south road allowance in Sec. 31, Tp. 54, r. 27, w. 4 m., at mileage 15.0.

21597. Apr. 3.—Ordering the C.N. Ontario Ry. and Campbellford, Lake Ontario and Western Ry. (C.P.R.) to widen approaches at Mary St. and James St., Belleville, Ont., to 24 ft., and provide protection fences and sidewalk.

21598. Apr. 6.—Amending order 21457, Mar. 9, re certain C.P.R. bridges.

21599. Apr. 1.—Authorizing Cedar Rapids Mfg. and Power Co. to take certain lands in Soulanges County, Que., for widening transmission line right of way.

21600. Apr. 6.—Authorizing C.P.R. to build spur for M. M. Cummings, Westboro, Ont.

21601. Apr. 6.—Authorizing C.P.R. to build road diversion at grade in Con. 16, Tp. 2, r. 15, w.p.m., Man.

21602, 21603. Apr. 6.—Authorizing C.N. Ontario Ry. to cross Davenport Road and St. Clair and Prescott Aves., Toronto, and to build structure carrying highway over railway.

21604, 21605. Apr. 6.—Authorizing Canadian Northern Ry. to build its Bienfait-Estevan Branch across C.P.R. spur in n. e. ¼ Sec. 19-2-6, w. 2 m., Sask., and rescinding order 20117, Aug. 16, 1913, in so far as it authorized crossing spur to Western Dominion Collieries; and to cross and divert road between Secs. 20 and 29-29-8, w. 4 m., Alta., and rescinding order 17158, Aug. 1, 1912, in so far as it authorizes similarly.

21606. Apr. 6.—Authorizing G.T.R. to build siding and spur for Lord and Burnham Co., Grantham Tp., Ont.

21607. Apr. 3.—Amending orders 19346 and 21197, May 19, 1913, and Jan. 12, 1914, respectively, re operation of crossing of Canada Southern Ry. industrial spur, and of Essex Terminal Ry, Windsor, Ont., and authorizing Sandwich, Windsor and Amherstburg Ry. to cross same not exceeding 10 miles an hour; seniority of C.S.R. and Essex Terminal Ry. not prejudiced by this order.

21608. Apr. 7.—Approving location of C.P.R. station at mileage 36.74, in Lot 4, Con. 11, Hinchinbrooke Tp., Ont.

21609. Apr. 6.—Authorizing Montreal and Southern Counties Ry. to operate over Central Vermont Ry. between Marieville and St. Cesaire, Que., 9 miles; and to use C.V.R. stations, yards and facilities between these points.

21610. Apr. 6.—Ordering City of Vancouver, B.C., to pay expenses of inspector appointed by C.P.R. to protect traffic at crossing of Harris St., pending final decision by Board.

21611. Apr. 6.—Ordering G.T.R., within 60 days, to install improved automatic bell at crossing of County Road 8, Moorefield, Ont.; 20% to be paid out of railway grade crossing fund.

21612. Apr. 8.—Authorizing G.T.R. and C.P.R. to operate over crossing in west half Lot 14, Con. 2, Trafalgar Tp., mileage 32.56 from Toronto, without first stopping trains.

21613. Apr. 8.—Authorizing C.P.R. to build spur for Heron Bros, Sudbury, Ont.

21614. Apr. 7.—Authorizing G. T. Pacific Ry. to build across 41 highways in North Alberta District, mileage 0 to 60.4.

21615. Apr. 7.—Authorizing G.T.R. to rebuild bridges at mileage 179.99, mileage 175.86, District 6, and mileage 62.88, District 5, Ont.

21616. Apr. 7.—Authorizing clearances of C. N. Quebec Ry. standard house for track scales.

21617. Apr. 8.—Authorizing Canadian Northern Ry. to operate, for construction purposes only, for three months, between 6 a.m. and 7 a.m., 12 and 1, and 6 and 7 p.m., over crossing of C.P.R. in Lot 101, St. Paul Parish, Man.

21618. Apr. 7.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur for Gillies Guy Coal Co., Hamilton, Ont.

21619. Apr. 7.—Authorizing Cedars Rapids Mfg. and Power Co., Montreal, to take certain lands in St. Joseph de Soulanges Parish, Que., for right of way of transmission line.

21620. Apr. 8.—Authorizing Montreal Light, Heat and Power Co. to lay gas pipe across swamp near western end of G.T.R. Turcot Yards, Que.

21621. Apr. 9.—Suspending, pending investigation by Board, increased rates on lumber shown in Supplement 51 to G.T.R. Tariff C.R.C. no. E-2318; C.P.R. Tariff C.R.C. no. E-2779; and C.N.R. Tariff C.R.C. no, E-419.

21622. Apr. 9.—Approving revised location of Esquimalt and Nanaimo Ry. between mileage 71 and 76.6, Vancouver Island, B.C.; and authorizing it to divert Government waggon road in Lot 66, from station 3657+43 to 3654+8, and to carry highway under railway.

21623. Apr. 9.—Authorizing Winnipeg Electric Ry. to cross, at grade, Canadian Northern Ry. spur to Arctic Ice Co. and Agricultural College, Fort Garry, Man.

21624. Apr. 8.—Approving location of C. N. Ontario Ry. station grounds at National Park, Boyd Tp., at mileage 170 from Ottawa.

21625. Apr. 9.—Authorizing C.P.R. to rebuild bridge 86.5, over Magog River, Sherbrooke Subdivision, Que.

2126. Apr. 14.—Approving certain deviations in location of Glengarry and Stormont Ry., from connection with C.P.R. in Lot 418, St. Polycarpe Parish, Que., southwesterly to east side of River Beaudet, Lot 8, Con. 5, Lancaster Tp., Ont., mileage 0 to 4.96; and from Lot 10, Con. 2, Charlottenburg Tp., mileage 15.04, to Ninth St., Cornwall, Ont., mileage 27.

21627. Apr. 14.—Amending order 21559, March 27, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) crossing of C. N. Ontario Ry.

21628, 21629. Apr. 11.—Establishing express collection and delivery limits in Lethbridge, Alta., and Regina, Sask., and rescinding orders 21088, Dec. 23, 1913, and 14906, Sept. 14, 1911.

21630. Apr. 9.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur across Lots 37 and 36, Con. 1, Ancaster Tp., Ont.

21631. Apr. 11.—Authorizing Great Northern Ry. to operate over C.P.R. crossing at mileage 1.4, Lot 1899, East Kootenay Dist., B.C., without first stopping trains.

21632. Apr. 11.—Approving location of C. N. Ontario Ry. station grounds at Lac a Travers, mileage 140.8 from Ottawa.

21633. Apr. 11.—Approving location of C.P.R platform and shelter at mileage 36.0, Bobcaygeon Subdivision, Ont.

21634. Apr. 14.—Reporting to Governor in Council for sanction Dominion Atlantic bylaw 13, approving General Train and Interlocking Rules.

21635. Apr. 14.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands in Oshawa for access to diversion of Albert St.

21636, 21637. Apr. 14.—Authorizing C.P.R. to use bridges 18.7, St. Gabriel Subdivision, and 11.3, Standbridge Subdivision, Que.

21638. Apr. 15.—Approving Pacific and Hudson Bay Ry. location from Bella Coola Harbor to Hagensborg, B.C., mileage 0 to 10.

21639. Apr. 14.—Authorizing Lake Erie and Northern Ry. to build bridge over Western Counties canal, at Brantford, Ont.

21640. Apr. 8.—Authorizing Toronto, Hamilton and Buffalo Ry. to take certain lands in Pelham Tp., Ont., for providing additional team tracks.

21641. Apr. 15.—Authorizing Canadian Northern Ry. to cross and divert public highways at mileage 76, Kipling Subdivision, Sask

21642. Apr. 14.—Authorizing Canadian Northern Ry. to build a highway crossing over its line on Second St. North, Leask, Sask.

21643. Apr. 14.—Ordering G.T.R., within 60 days, to install stop blocks on sidings at east side of Cherry St., Toronto.

21644. Apr. 9.—Authorizing G.T.R. to build siding for American Road Machine Co. of Canada, Goderich, Ont.

21645. Apr. 14.—Authorizing G.T.R. to use bridge 257, mileage 25.25, Milton, Ont.

21646. Apr. 14.—Amending order 19646, May 16, 1913, re C.P.R. operation of interlocking plant at Batiscan River Bridge, Que.

21647. Apr. 16.—Approving revised location G.T. Pacific Branch Lines Co. Battleford Branch, through n.w. ¼ Sec. 4-43-16, w. 3 m., Sask.

21648. Apr. 15.—Approving revised location G. T. Pacific Branch Lines Co. station at Coalspur, mileage 35.8, Alberta Coal Branch, Alta.

21649. Apr. 16.—Amending order 21537, March 23, re certain G.T.R. bridges in Ontario.

21650. Apr. 15.—Authorizing C. N. Ontario Ry. to build bridge over Raimbault Creek, St. Laurent Parish, Que., mileage 48 from Hawkesbury; and rescinding order 19657, June 21, 1913, in same connection.

21651. Apr. 15.—Approving location of Canadian Northern Ry. extension of its Swift Current line through Tps. 15-10 and 12, w. 3 m., Sask., mileage 124.96 to 142.53.

21652. Apr. 17.—Authorizing C.P.R. to build spur for F. A. Fish, Caledon Tp., Ont.

21653. Apr. 17.—Ordering G. T. Pacific Ry., within 30 days, to reappoint station agent at Zelma, Sask.

21654. Apr. 18.—Authorizing C.P.R. to build road diversion in Sec. 22-36-11, w. 4 m., Alta., and to build its Swift Current Northwesterly Branch across 11 highways at grade, mileage 0 to 13.

21655. Apr. 16.—Authorizing Esquimalt and Nanaimo Ry. to build siding for British Columbia Pottery Co., Esquimalt, B.C.

21656. Apr. 16.—Relieving G.T.R. from providing further protection at crossing of St. Patrick St., Port Dover, Ont.

21657. Apr. 17.—Authorizing Hamilton Cataract Power, Light and Traction Co. to erect 2,400 volt overhead distribution circuit over G.T.R. at Ferguson Ave., Hamilton, Ont.

21658. Apr. 15.—Approving clearances as shown on plan of overhead platform runway to serve Toronto, Hamilton and Buffalo Ry. on north side of Forest Ave., Hamilton, Ont.

21659. Apr. 18.—Authorizing C. N. Ontario Ry. to build across Castle Crescent Road, York Tp., carrying highway over railway.

21660. Apr. 17.—Authorizing Canadian Northern Ry. to cross and divert south road allowance between Secs. 7 and 8-26, and highway between Secs. 19-5-27 and 24-5-28, w. 2 m., on its Maryfield Branch, Sask.

21661. Apr. 16.—Authorizing Montreal and Atlantic Ry. to build siding for Bedford Manufacturing Co., Bedford, Que.

21662. Apr. 16.—Authorizing Western Canada Power Co. to build spur from main line through Langley Indian Reserve no. 2, crossing a highway and connecting with trestle in Stave River, B.C.

21663. Apr. 15.—Authorizing Montreal and Atlantic Ry. to build spur for B. R. Stevens, Bedford, Que.

21664. Apr. 17.—Authorizing C.P.R. to build Y at grade at mileage 230, Weyburn-Stirling Branch, across road allowance between Secs. 8 and 17, Tp. 8, R. 18, w. 3 m., Sask.

21665. Apr. 17.—Authorizing C.P.R. to alter and extend tracks at Hardisty St., Fort William, Ont.

21666, 21667. Apr. 17.—Authorizing C.P.R. to build spurs for J. E. Wilder, Montreal, Que., and for Goold, Shapley & Muir Co., Regina, Sask.

21668. Apr. 17.—Authorizing C.P.R. to build at grade spur for City of Moose Jaw across River St., and to build at grade Y connection across Manitoba St. and Second Ave., Moose Jaw, Sask.

21669. Apr. 15.—Authorizing C.P.R. to build spur for City of Edmonton, Alta.

21670. Apr. 16.—Authorizing C.P.R. to rebuild bridge 37.5, Havelock Subdivision, Ont.

21671. Apr. 15.—Authorizing Esquimalt and Nanaimo Ry. to build siding for Empire Lumber Co. at mileage 2.5, Osborne Bay Branch, Vancouver Island, B.C.

21672. Apr. 18.—Approving location of Pointe aux Trembles Ry. through Montreal East, Que.

21673. Apr. 18.—Authorizing Cedar Rapids Mfg. and Power Co. of Montreal to take an additional width for right of way of transmission line, St. Joseph de Soulanges and St. Ignace du Coteau du Lac Parishes, Que.

21674. Apr. 17.—Ordering C.P.R. to build spur for Dustbane Manufacturing Co., Gloucester Tp., Ont.

21675. Apr. 18.—Authorizing C.P.R. to build and rearrange sidings for McGregor and McIntyre, North Toronto, Ont.

21675. Apr. 18.—Authorizing C.P.R. to build spur for S. A. Early & Co., Saskatoon, Sask.

21677, 21678. Apr. 18.—Authorizing C. N. Ontario Ry. to build across Scarlett Road and Jane St., York Tp., carrying highways over railway.

21679. Apr. 20.—Ordering C.P.R. to build spur for S. A. Hamilton Co., Moose Jaw, Sask.

21680. Apr. 18.—Authorizing Canadian Northern Ry. to build across 29 highways in Sask.

21681. Apr. 21.—Relieving G.T.R. from providing further protection at crossing of highway immediately east of Pike Creek flag station, Tecumseh, Ont.

21682. Apl. 22.—Authorizing G.T. Pacific Branch Lines Co. and C.P.R. to operate over crossing in Calgary, Alta., without stopping trains.

21683. Apl. 21.—Amending order 18032, Nov. 13, 1912, re G.T.R. subway at Cardinal, Ont.

21684. Apl. 21.—Relieving G.T.R. from providing further protection at crossing of Colborne St., London, Ont.

21685. Apl. 20.—Authorizing C.P.R. to build highway crossing at grade at McDougall St., Port Arthur, Ont.

21686. Apl. 20.—Suspending sine die, G.T.R. and Michigan Central Rd. schedules in so far as they increase rates now charged on caustic soda and bleaching powder; disallowing Pere Marquette Rd. schedule in so far as it increases rates charged on same commodities, and ordering that rates lawfully in force immediately prior to said schedules be continued until further order.

21687. Apl. 22.—Authorizing Saskatchewan Government to build highway crossing through Canadian Northern Ry. station grounds, at Brancepeth siding, Sask.

21688. Apl. 21.—Authorizing Canadian Northern Ry. to build across 17 highways in Alberta.

21689. Apl. 25.—Amending order 20423, Sept. 25, 1913, re City of Ottawa's sewer across C.P.R. lands.

21690. Apl. 27.—Amending order 21513, Mar. 16, re connection of London and Lake Erie Ry. and Transportation Co.'s line and Michigan Central Rd. at St. Thomas, Ont.

21691. Apl. 26.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands in Bowmanville, Ont., for freight yard and approaches.

21692. Apl. 23.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional 25 ft. for right of way of transmission line across Lot 7, Con. 2, Cornwall Tp., Ont.

21693. Apl. 28.—Amending order 21476, March 11, authorizing G.T.R. to use bridge over viaduct near Port Hope Station, Ont., to make it read as an authorization to use viaduct near Port Hope Station, Ont.

21694. Apl. 21.—Relieving C.P.R. from speed limitation of 15 miles an hour between mileage 0 and 41, Golden to Spillimacheen, B.C.

21695. Apl. 28.—Authorizing C.P.R. to use bridges 15.6 and 91.1, Lethbridge Subdivision, Alta.

21696. Apl. 27.—Dismissing Milton Pressed Brick Co.'s complaint against C.P.R. in suspending work on double tracking between Toronto and Guelph Jct., Ont.

21697. Apl. 28.—Authorizing Kettle Valley Ry. to build across 3 highways near Penticton, B.C.

21698. Apl. 29.—Authorizing Canadian Northern Ry. to build spur for P. O. Dwyer Co., Edmonton, Alta.

21699. Apl. 29.—Authorizing G.T.R. to build extensions to siding and spur therefrom for Maple Sand, Gravel and Brick Co., Vaughan Tp., Ont.

21700. Apl. 29.—Authorizing G.T.R. to build siding for Toronto Brick Co., Scarboro Tp., Ont., near York station.

21701. Apl 29.—Authorizing Alberta Central Ry. to build its ballast pit spur at grade across two highways at mileage 34 west of Red Deer, Alta.

21702. Apl. 29.—Authorizing Canadian Northern Ry. to build across 23 highways in Saskatchewan.

21703. Apl. 29.—Authorizing C.P.R. to rebuild bridges 7.6, Emerson Subdivision, and 8.4, Winnipeg Beach Subdivision, Man.

21704. Apl. 29.—Authorizing C.P.R. to rebuild bridge 11.9, Brandon Subdivision, Man.

21705. Apl. 28.—Authorizing C.P.R. to build ballast pit across highway, at mileage 23.79 Swift Current Northwesterly Branch, Sask.

21706. Apl. 21.—Authorizing clearances as shown on C.P.R. plan under file 23749, pending rearrangement of switching lead to provide standard 13 ft. clearances between centres of all tracks at West Toronto, Ont.

21707. Apl. 25.—Authorizing Canadian Northern Ry. to build spur to gravel deposit in n.w. ¼ Sec. 8-15-1, w.p.m., for Lake Winnipeg Shipping Co.

21708. Apl. 29.—Authorizing C.P.R. to build spur for Canada Cement Co. in St. Charles Parish, Man.

21709. Apl. 29.—Authorizing C.P.R. to build spur for Calgary Paint and Glass Co., Calgary, Alta.

21710. Apl. 29.—Approving G.T. Pacific Ry. bylaw 15 appointing G. T. Bell, W. P. Hinton and W. E. Duperow to prepare and issue tariffs of tolls, and rescinding order 8288, Oct. 8, 1909, in similar connection.

21711. Apl. 28.—Ordering G.T.R. to install gates, operated by day and night watchmen, at crossing of Eighteenth Ave., Lachine, Que., apportioning cost of installing and operating, and rescinding order 9616, Feb. 7, 1910, directing installation of electric bell.

21712. Apl. 29.—Authorizing C.N. Ontario Ry. to cross Weston plank road, Toronto, by structure carrying highway over railway.

21713. Apl. 29.—Authorizing Pointe aux Trembles Terminal Ry. to build across Montreal Terminal Ry. in Pointe aux Trembles Parish, Que.

21714. Apl. 29.—Authorizing C.P.R. to build additional track (double track) across Champlain St., St. Johns, Que., mileage 19.9, temporarily, pending hearing in Montreal, May 15.

21715. Apl. 30.—Approving location of C.P.R. platform and shelter at mileage 9.20, Bobcaygeon Subdivision, Ont.

21716. Apl. 30.—Dismissing complaint of R. L. Rice, Vancouver, B.C., against charge by C.P.R. for two seats in sleeping car for daylight journey from Sicamous to Vancouver.

21717, Apl. 30.—Authorizing Canadian Northern Ry. to operate for construction purposes only, for 90 days from date, pending installation of interlocking plant, over crossing of C.P.R., Lot 101, St. Paul's Parish, Man.; trains to be flagged over by watchmen, appointed by C.P.R. at expense of C.N.R., and rescinding order 21617, April 9.

21718. Apl. 30.—Approving G.T.R. bylaw appointing certain officials to prepare and issue tariffs of tolls, and rescinding order 13449, Apl. 18, 1911.

21719. Apl. 28.—Relieving G.T.R. from providing further protection at crossing of Danforth Road, east of Scarboro Jct., Ont.

21720. Apl. 30.—Authorizing G.T.R. to build siding for W. R. Smith, Toronto.

21721. May 1.—Amending order 4353, Feb. 3, 1908, re C.P.R. spur for Northwest Jobbing and Commission Co., Lethbridge, Alta.

21722. Apl. 27.—Authorizing C.P.R. to take certain land for enlarging station yard at Laval Rapids, Que.

21723. May 1.—Approving C.P.R. plan, showing proposed rearrangement of interlocking plant at crossing of Quebec, Montreal and Southern Ry. at Iberville Jct., Que.

21724. Apl. 28.—Approving C.P.R. plan showing layout of crossing bell at First Ave., Oak Lake, Man.; and relieving it from speed limitation of 10 miles an hour in operation of trains over crossing.

21725. Apl 29.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build across unopened road allowance at mileage 88.62, Murray Tp., Ont.

21726. Apl. 22.—Authorizing G.T.R. to build siding for S. W. Marchment near St. David's, Ont.

21727. Apl. 27.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional right of way for transmission line across Lot 122, St. Ignace du Coteau du Lac Parish, Que.

21728. Apl. 29.—Authorizing Marcil Trust Co. to relocate farm crossing on official Lot 61, Pointe Claire Parish, Que., about 75 ft. eastward, work to be done under supervision of G.T.R. engineer.

21729. Apl. 22.—Authorizing Canadian Northern Ry. to cross abandoned C.P.R. right of way in East Selkirk, Man., reserving questions of seniority and protection until C.P.R. desires to lay tracks there.

Canadian Pacific Railway Construction, Betterments, Etc.

Sir Thomas Shaughnessy returned to Montreal, May 19, after having made a trip over the line as far as Vancouver, following his attendance at Sir William Whyte's funeral in Winnipeg. He did not make any general statement as to the work in progress, or as to future developments, but on May 6, at Winnipeg, he is reported to have said there is no intention on the part of the company to undertake any further work on the western lines this year, that the company will go ahead with the work started in 1913, and everything will be carried through to completion as rapidly as possible, and that the second track work will be proceeded with, although along the Thompson River, east of Spence's Bridge, it had been stopped pending the starting of the Kettle Valley Line service via the Nicola Valley. During his trip Sir Thomas formally opened the Bassano Dam, in the irrigation district of Alberta.

Atlantic Division.—It is reported that the betterments to be carried out during this year include the laying of 13 miles of 85 lb. steel; replacing 40 wooden and stone culverts with concrete structures; ballasting 25 miles of track; laying 61.5 miles of heavier steel on branch lines; erecting shelters, loading platforms, and other buildings at a large number of places in the division.

Eastern Division.—The Board of Railway Commissioners has authorized the erection of a bridge across Richelieu St., St. Johns, Que.

Ontario Division.—An official inspection of the Campbellford, Lake Ontario and Western Ry., the line from Glen Tay to Agincourt, Ont., 182 miles, was made, May 12. Ballasting is being completed, and the station and other buildings are fast being got into shape. A regular train service will be put in operation July 1.

The second track which is being built from Leaside Jct. to Agincourt, Ont., is expected to be completed by June 1. The bridge over the Don River, nine miles from the Toronto Union Station, has been widened. It is 1,000 ft. long, the rail level being 120 ft. above water level. The superstructure is carried on nine steel towers on concrete bases, and two concrete abutments. In two of the towers openings are provided for railways, one on each side of the river. The contract for the substructure was carried out by Dickenson and Burns; and the superstructure is being erected by the Canadian Bridge Co. The C.P.R. has now a double track line westerly from Montreal to Glen Tay; two lines from that point to Agincourt—the old line via Peterborough, and the new Campbellford, Lake Ontario and Western Ry.; and a double track from Agincourt through Toronto to Guelph Jct.

Lake Superior Division.—J. J. Scully, General Superintendent, is reported to have said that 150 miles of second track have been completed on this division between Romford and Port Arthur, Ont., and that about 45 miles more will be built this year. The work is not continuous but is in stretches of about 10 miles each. In carrying on this work, a number of diversions of track have been made in order to reduce gradients and to flatten out curvature.

The Board of Railway Commissioners has approved of revised location for the building of second track, mileage 51.49 to 54.37, Schreiber subdivision, and mileage 10 to 14, Nipigon subdivision.

A contract is reported to have been let to the Somervion Construction Co., for work at the sinkhole near Rossport, Ont., which gave the company considerable trouble last autumn.

Manitoba Division.—The Board of Railway Commissioners has authorized the opening for traffic of the Bergen northeasterly line, double track from mileage 0 to 9.92, Emerson subdivision; second track mileage 0 to 2.08 Lac du Bonnet subdivision from Whittier, mileage 65.1 to Murdock, mileage 62.2. The cutoff has a total length of 12 miles, and enables freight trains to be run through east and west without passing through the Winnipeg yards. The line was put in operation, May 4, on which date the new yards at North Transcona were opened for business.

A new station and freight shed is in course of erection at Emerson, Man.

The line from Weyburn across South Saskatchewan is at present in operation to Assiniboine, and a service is being started from there to Shaunavon, 118.3 miles. The line is to connect up with the Alberta Ry. and Irrigation Co.'s line at Stirling, Alta.

Saskatchewan Division.—The work on the building of a second track on the main line is being pushed ahead rapidly. The Board of Railway Commissioners has authorized the opening for traffic of the section to mileage 110.5, Swift Current subdivision, and other sections are expected to be ready for opening shortly.

The Board of Railway Commissioners has approved of revised location plans for the extension of the Swift Current northeasterly branch, from sec. 14, tp. 36, range 11, to sec. 6, tp. 38, range 11, west of the 4th meridian.

Alberta Division.—The line known as the Weyburn-Lethbridge branch has been opened for traffic from Stirling, on the Alberta Ry. and Irrigation Co.'s line, to Foremost, 49.1 miles. A contract is reported let to G. H. Webster, Calgary, for grading on the line for a further distance of 25 miles easterly. It is not expected to lay any steel on this grading this year. This mileage will have a gap of about 50 miles to be graded to meet the work being done from the western end of the branch.

A press report states that 25 miles of steel will be laid on the branch west of Retlaw, Alta., this season. About 20 miles of grading is reported to have been completed from Retlaw in the direction of Blackie, on the Alderside line, at which point the branch under construction from Suffield will effect a junction.

British Columbia Division.—It was reported, May 9, that the pioneer tunnel at the eastern end of the Rogers Pass tunnel had been driven 1,800 ft., and that passages were being broken from it to the points at which work on the main tunnel is to be started. The excavation at the western portal of the tunnel is being proceeded with, and it is expected that the driving of a pioneer tunnel will be started from that end at once.

Construction is being proceeded with on the Kootenay Central Ry., and it is expected that tracklaying will be completed by Dec. 31.

The work on the reconstruction and standardizing the gauge of the Kaslo and Slocan Ry. has been completed, and a train service is to be put in operation over it during June.

The erection of the double track bridge across the Pitt River has been started, and the Dominion Bridge Co. expects to have it completed by October. The spans of the single track bridge are being removed on pontoons to the site of the new traffic bridge which the British Columbia Government is building about 200 yards away. (May, pg. 228.)

The Grand Trunk Railway Semi-Annual Meeting.

At the half yearly meeting in London, Eng., Apr. 29, A. W. Smithers, Chairman, in moving the adoption of the report for the six months ended Dec. 31, 1913, reviewed the operations for that period. The gross receipts were £4,768,916, an increase of £156,158 over those of the same period of the previous year. Of this increase, £27,903 was from freight and live stock, and £15,548 from other sources. The operating expenses including taxes were £3,560,157, an increase of £225,475, made up as follows,—maintenance of way and structures £69,102, traffic expenses £12,032, conducting transportation £139,547, general expenses £18,275, taxes £17,070, less a decrease in charges for maintenance of equipment £30,551. Twelve stations were built during the year out of revenue. The capital expenditure was £2,092,815, of which, £1,911,698 was for rolling stock, consisting of 75 mikado, 10 Pacific and 5 switching locomotives, 809 coal cars, 5,125 box cars and 825 refrigerator cars. The saving in the charges for hire of equipment during the half year was £108,000. There was an increased debit of £25,000 on account of the Canada Atlantic Ry., and an improvement of £30,000 in the Detroit, Grand Haven and Milwaukee Ry. The net result for the half year is that, notwithstanding the increased interest charges, wages and cost of materials, the same dividends will be paid as in 1912, and approximately £16,700 is carried forward to the current year.

The chairman also referred to the progress made by the G. T. Pacific Ry., and announced the linking up of the line with the National Transcontinental Ry. in September, and the establishment of a full passenger and freight service over the whole line early next year. He also dealt at some length, with the recent order of the Board of Railway Commissioners regarding freight rates in the west, full details of which were given in Canadian Railway and Marine World for May, and commented on the financial situation generally.

The Grand Trunk Act 1914, which gives power to issue further capital stock to the extent of £2,500,000 4% debenture stock, and also changes the issue of reports and the holding of meetings from half yearly to yearly, to bring the company into conformity with other companies, was approved, as was also the Grand Trunk and Canada Atlantic Amalgamation Act, which will enable the company, by the absorption of the Canada Atlantic Ry. Co., to raise capital for necessary rehabilitation of the line, on the best possible terms.

Dividends were declared for the half year, as follows,—4% guaranteed stock, 2%; first preference stock, 2½%; second preference stock, 2½%; third preference stock, 2½%.

The retiring directors, J. A. Clutton-Brock and W. Molson MacPherson, were re-elected for the current year, and A. F. Whinney and C. Percy were re-elected auditors in England and Canada respectively.

Canadian Society of Civil Engineers.—At a meeting at Edmonton, Alta., May 1, a branch of the society was formed with headquarters at the University of Alberta, and it was decided that meetings be held fortnightly. The officers for the current year are:—Chairman, W. M. Edwards, Professor of Civil Engineering, University of Alberta; Secretary-Treasurer, L. B. Elliott, Department of Public Works; Executive Committee, J. Chalmers, W. R. Smith, N. M. Thornton, D. J. Carter, J. D. Robertson and R. H. Parsons.

The New Union Station at Toronto.

Plans for the new union station in Toronto have been drawn up, and it is expected that they will shortly be in condition for the calling of tenders, it being the stated intention to proceed with the work without further delay. The accompanying illustrations show the general scheme as it will appear on completion.

Perspective View, Toronto Union Station.

The site selected is to the east of the present union station, on the portion of the area swept over by the big Toronto fire in 1904, bounded on the north by Front St., and on the east and west by Bay and York Sts., respectively, this site having been expropriated by the railways immediately after the fire. The only buildings on the site that had to be removed were two at the York St. end of the Front St. frontage.

The floor plan of the station will be in the form of an inverted T, the leg projecting under the tracks, with the cross part along Front St. The building is to be of the Roman type of architecture, built of a light colored stone, Indiana limestone and granite being the probable choices.

The street in front of the station will be widened by 25 ft., and the line of columns along the front entrance of the building will be back 77 ft. from the present street line, making the frontage of the building quite impressive and open. At each end, the building will also stand back 50 ft., which should result in giving it an imposing setting, and, from the fact that it will occupy the whole block, there will be no room for the unsightly small stores that seem to form a parasitic growth around many large railway terminals.

The main station level will be about 18 ins. above that of Front St., and will be entered through a 25 ft. entrance way at each end of the front row of columns, these entrances leading into the ends of a large ticket lobby 250 by 84 ft., the long way of which will be parallel to Front St. This ticket lobby is to be the central point of the whole station scheme, the whole project being built up around it in a very convenient manner.

With the idea of convenience uppermost in the minds of the designers, the information booth will be situated in the centre of the ticket lobby, equally convenient to both entrances, and equally convenient to all the station conveniences, and from this central point they can be pointed out by the information booth attendants, with a minimum amount of confusion on the part of the railway patron in locating the desired objective.

Along the north wall of the ticket lobby, occupying the full distance between the entrance ways, will be 20 ticket booths, with the ticket agent's office centrally situated in this row. Along the opposite wall of the ticket lobby will be the baggage room and parcel room, each 60 by 40 ft., and each having a counter along the ticket lobby side. Midway between these two rooms will be a 40 ft. passageway to the trains.

The east end of the ticket lobby will connect with the lunch room and restaurant accommodation, which, with the service room, will occupy the full width of the building at that end, or a space of 152 by 76 ft. The opposite end of the ticket lobby will contain all the passengers' more personal facilities, including the main waiting room, 88 by 64 ft., centrally situated in that end. Connecting from this on the north will be the women's rest room, adjoining which are to be the toilet facilities, occupying a total space of 68 by 34 ft. The opposite side of the waiting room will consist of the men's accommodation, including lavatories, barber shop, baths and smoking room, a total space of 60 by 25 ft. The waiting room will be entered from the ticket lobby through two side passageways, from which entrance may be had to the accommodations connected with the waiting room, through intermediary lobbies. The extreme west end of the building will be entered from the street through a separate doorway, and will contain the local offices. The east end will be used by the post office department and will have a similar entrance to that at the other end of the building.

As mentioned, there is to be a 40 ft. opening centrally in the south side of the ticket lobby, leading down a 5½% ramp to the train waiting room. Flanking this passageway, there will be on one side a news stand, on the other a telegraph and telephone room, in the respective ends of the baggage and parcel rooms. Owing to the level of Front St., which is practically that of the main station level, being about midway between that of the present rail level and the rail level when the track elevation scheme is completed, it was possible to locate a train waiting room beneath the tracks, approachable by the 5½% ramp down from the ticket lobby. The difference in elevation between tracks and train waiting room will be 13.9 ft. This train waiting room, while not of great height, will have an area of 100 by 230 ft. in length from north to south, at right angles to the tracks.

Perspective of Ticket Lobby, Toronto Union Station.

Seating accommodation will be provided by 11 double cross seats down the centre of the room. On either side of the train waiting room, at the entry end, there will be additional lavatory accommodation, with entry lobbies at this level, communicating through stairways with large toilet rooms. Along either side of the train waiting room, through the balance of the length, as well as on the south end, there will be shop area for the convenience of passengers in making the light purchases peculiar to travelling.

Combination passenger and baggage platforms are to be used, and will be reached from the train waiting room by a 6 ft. stair on each side for each platform. Duplicate stairways will lead down from the platforms to the east and west of these stairways, into 25 ft. exit passageways that will flank the train waiting room on either side. Between the train waiting room and these passages there will be, on either side, two cross passages for communication purposes.

One of the underlying ideas in the station design was to develop a scheme whereby the traffic could be handled with a minimum of confusion, for which purpose special provision must be made to so handle the incoming passengers that their movements will not in any way interfere with those of the passengers proceeding to the trains. This scheme has been developed in a twofold manner, either of which can be used as the volume of traffic warrants. Near the front end of the train waiting room, the flanking exit passages will widen and divide, with a central division wall, attached to which will be a gate that may be swung across either one of the arms of the divided passage. Normally the inner passages will be barred, the outgoing passengers proceeding along the passageway into the ends of the ticket lobby, where the incoming passengers may meet their friends, the large area available, and the opportunity the incoming stream of passengers has to stretch out in proceeding along this long passageway, eliminating the crowding and confusion usually incidental to meeting in congested quarters.

When the traffic is heavy, as at holiday times and during the Canadian National Exhibition, the exit passageway normally in service will be closed by the gate being swung across, the incoming passengers being diverted along similar passageways paralleling the ticket lobby, these passageways on either side descending a 7% ramp and meeting at the centre, leading from there into a basement-level station of identical layout to that above in most particulars. Passing across the exit concourse, the passengers will leave by a central doorway, branching right and left and ascending a 9% ramp to the main street doors. In this manner the incoming crowd will be kept at all times entirely separate from the outgoing passengers, and will be directed in such a manner along easily followed passages that there can be no confusion.

As stated, the lower level waiting accommodation will be almost identical with that above. The exit concourse will be similarly situated and of the same width, but slightly shorter than the ticket lobby above. With the latter it will communicate with a stairway at each end. In the centre will be a duplicate of the information booth, with ticket offices on the north side and parcel and grip rooms along the south side, making it to all intents and purposes a reserve station of similar capacity to the one above.

Between the new street curb and the face of the building there will be an open court the full length of the building, bridged at the centre for the entrance porch and either end for the office and post office entrances. Baggage will enter by way of the open court passageway from the York St. end, leaving it in the baggage quarters at the York St. end of the lower level. Carriages will proceed along the front of the building in the lower court, drawing up in front of a carriage arcade which will communicate with the carriage lobby, this latter being directly off the west end of the exit concourse. The exit will be by way of Bay St.

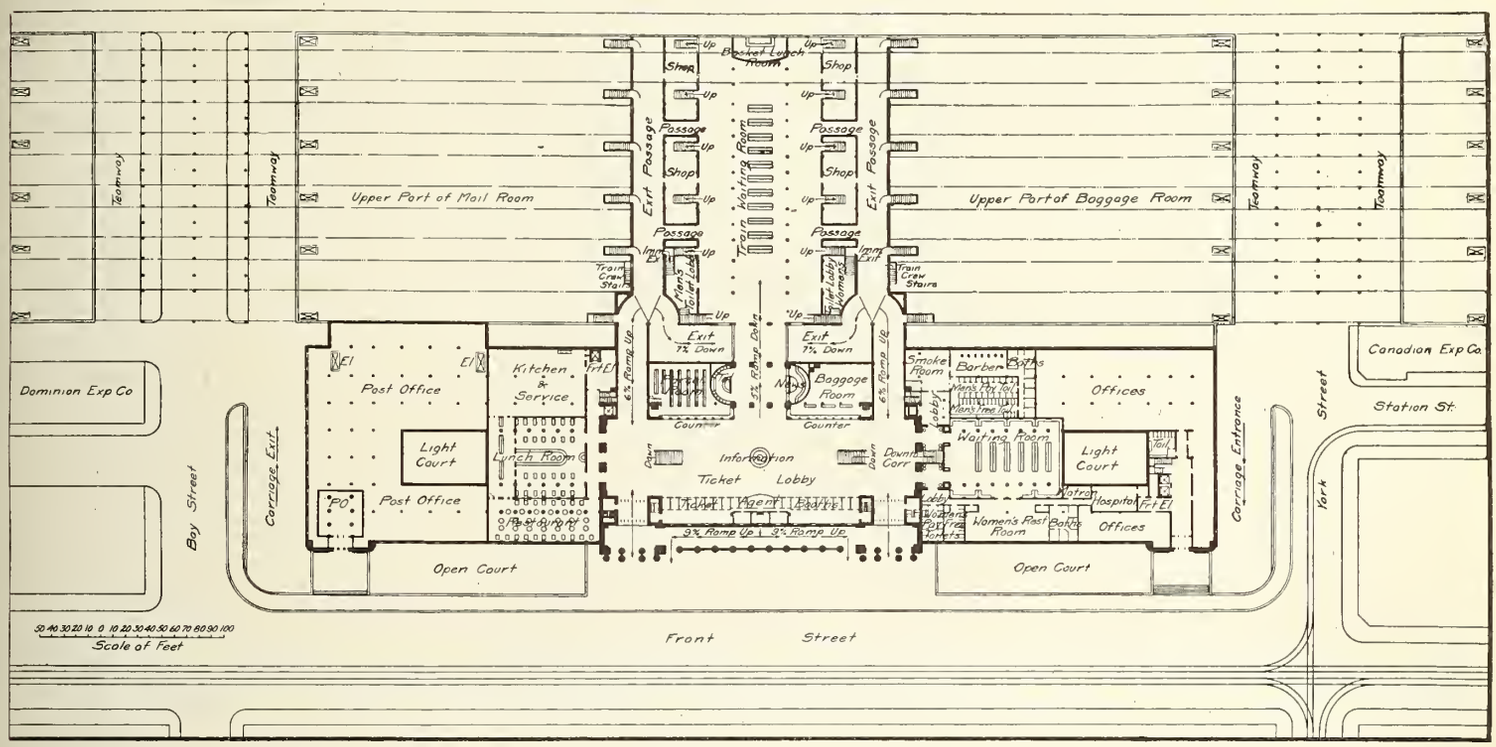
The baggage room will occupy the whole of the west end of the lower level, extending out under the track area as well. Most of the opposite end will be for post office accommodation. At the extreme ends of these spaces, 32 ft. back from the street and 342 ft. apart, there are to be elevators from the lower level to each platform for transferring the baggage and mail between the train platforms and the lower level rooms. Near the back of the station building there will be a trucking space, slightly lower than the lower level floor, and passing under the streets at either end to cross tunnels, along which will be additional elevators to the platforms. In one corner of the baggage space will be the customs lobby, connecting through the carriage lobby with the exit concourse.

Special accommodation has been provided in the design for the accommodation of immigrants. In the upper level plan it will be observed that in each exit passage there is to be a descending stairway leading to a cross passage in the lower level. This passage will connect with a series of rooms to the immediate east of the exit concourse, these rooms consisting of immigrants' waiting room, lavatories, lunch and kitchen service rooms, Provincial and Dominion agents, and laundry, this section of the station being entirely segregated from the balance of the station.

There will be ten through tracks in the station, in pairs, with a combination platform between each pair. The combination platforms will be 20 ft. wide, and they have been so planned that while passengers and baggage will use the same platforms, they will not come in contact. At each end of each platform, as previously stated, there are to be two elevators connecting with the lower level. The baggage will thus be handled at the outer ends of the platforms, and then through the lower subway for any lengthwise shifting, while the passengers will all move towards the centre of the platforms, where the stairways will be located. The train shed will be of the improved Bush type.

The upper three floors of the building will contain the railway divisional offices.

In the preparation of the plans, a great deal of comparative data was collected, from which to develop a scheme that would best meet the local requirements. This has involved the compilation of passenger statistics both in Toronto and many of the other larger cities on this continent, covering a period of several years. Some interest-

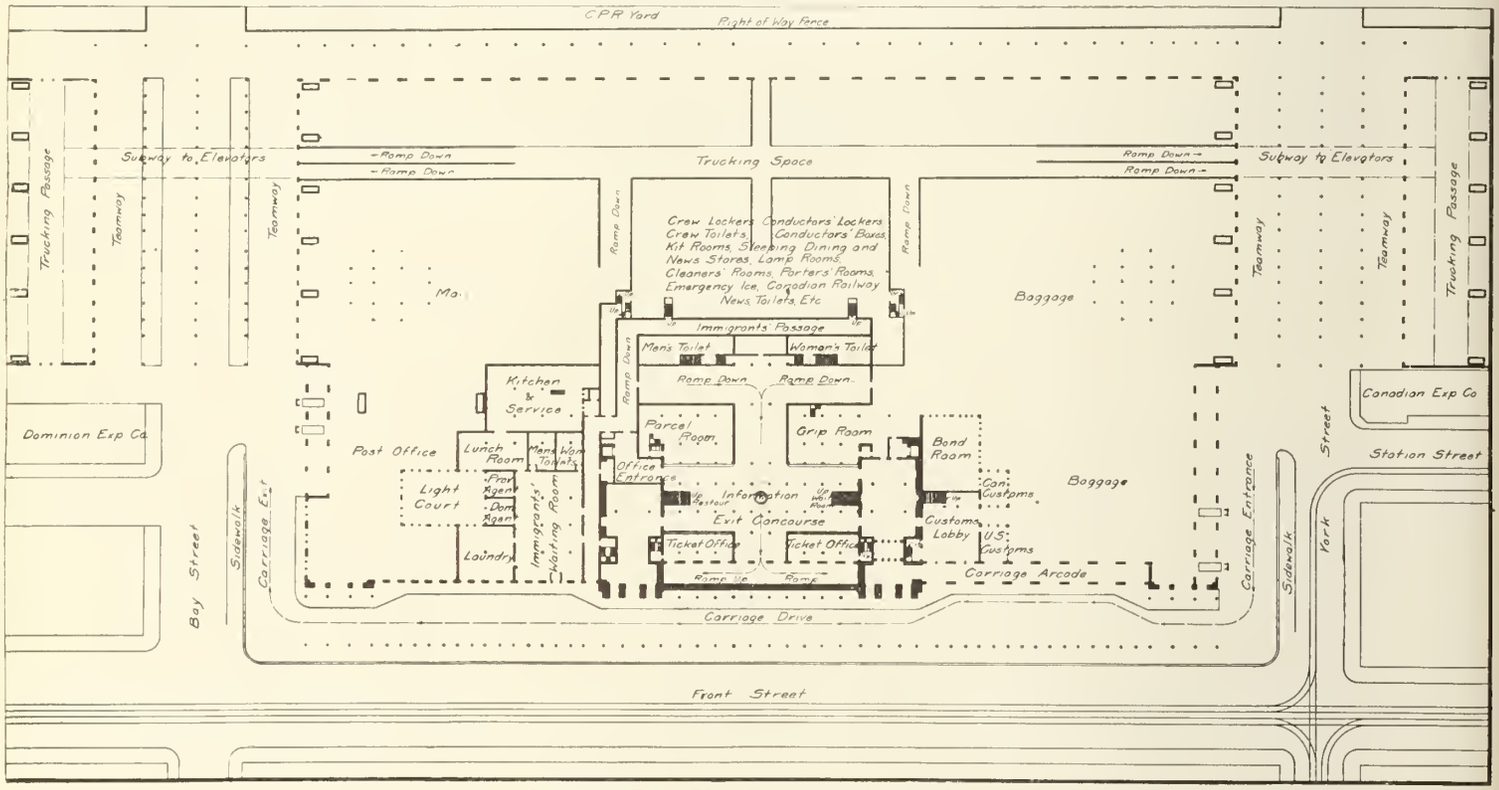


Main Floor Plan, Toronto Union Station.

ing facts are developed from the report of the investigators. It shows that the passenger traffic is about equal to that of Washington, D.C., and about half that of Kansas City or St. Louis. The baggage handled is shown to be equal to that of the New York Pennsylvania Rd. station and nearly as great as that at the St. Louis station, Boston South station, and the New York Grand Central station. The parcel traffic handled is about the same as the baggage in relation to these cities, including in the last number Kansas City and St. Louis. It is of interest to note that the average number of pieces of baggage per passenger is greater in Toronto than in any other large centre on this continent.

The estimated cost of the station will be in the neighborhood of $3,000,000, and it will form a part of the $15,000,000 grade separation project ordered by the Board of Railway Commissioners, and which was described in detail in Canadian Railway and Marine World, Dec., 1913. All the objections raised by the city against the design of the station were overruled by the Board in its sitting of May 5 last. The city wanted greater head room in the train waiting room, but the Chief Commissioner ordered that the 10 ft. provided was ample, as an increase would involve the objectionable feature of more stairs, which, in the present design, are eliminated entirely in all places where there will be a large crowd. He also ruled against separate passenger and baggage platforms, stating that the experience of other large centres proved that the combination platform was quite as satisfactory. This ruling was qualified by an order forbidding the trucking of baggage passed to the passenger stairways, which, as already explained, the design makes quite unnecessary. The request that the platforms be ordered higher could not be complied with, as the Chief Commissioner considered that the advantages to be obtained would not be sufficient to warrant the Board in ordering the railways to change their rolling stock for this purpose. While the possible inconvenience of people meeting incoming friends was recognized, the larger advantages of the general scheme outweighed any advantages to be derived from a direct exit passage. If the light traffic exits were found to be unsatisfactory, an order could be issued compelling the use of the lower level exit at all times.

The Union Station is being built by The Toronto Terminals Railway Co., an organization of G.T.R. and C.P.R. interests formed to handle this project. The Chief Engineer of the company is J. R. W. Ambrose, who has been engineer in charge of the Toronto Grade Separation for the G.T.R. H. R. Safford, Chief Engineer, G.T.R., and J. M. R. Fairbairn, Assistant Chief Engineer, C.P.R., are acting as consulting engineers to the company. The architectural plans have been developed by Ross and Macdonald and Hugh G. Jones, Montreal, who are the architects, and with whom is associated John M. Lyle, Toronto. We are indebted to Mr. Lyle for the information on which this article has been prepared.



Basement Floor Plan, Toronto Union Station.

Dominion Government Railway to Hudson Bay.

Some general information in regard to construction of this line appears on page 258 of this issue.

Work on the terminals at Pas, Man., is reported to have been started, and it is expected to have it completed by the end of the summer.

Tenders are under consideration for the supply of the hardware necessary for the construction of the terminals at Port Nelson.

Replying to questions in the House of Commons, April 30, the acting Minister of Railways said the party of 130 men with 50 horses which left Pas, in January, in charge of J. F. Pratt, arrived at Port Nelson, April 9. The horses which were taken to haul supplies and outfit for road making, were not taken through. The men who formed the original party did not all go through, some left and joined the construction gangs en route, and men left the construction gangs to join the party. The total number arriving at Port Nelson was 148, all of whom were afterwards employed by the Department at that place.

Birthdays of Transportation Men in June.

Many happy returns of the day to:—

Jas. Anderson, Manager, Sandwich, Windsor and Amherstburg Ry., Windsor, Ont., born at Ayr, Ont., June 20, 1851.

W. C. Bowles, General Freight Agent, Western Lines, C. P. R., Winnipeg, born at Montreal, June 3, 1875.

J. H. Boyle, Superintendent, District 3, Lake Superior Division, C. P. R., Schreiber, Ont., born at Waterloo, Que., June 26, 1869.

F. P. Brady, General Superintendent, Canadian Government Railways, Moncton, N. B., born at Haverhill, N. H., June 22, 1853.

H. W. Brodie, General Passenger Agent, Lines West of Revelstoke, C. P. R., Vancouver, B. C., born at Fredericton, N. B., June 8, 1874.

A. H. N. Bruce, M. Can. Soc. C.E., Chief Engineer, Quebec and Saguenay Ry., Quebec Ry., Light, Heat and Power Co., etc., Quebec, Que., born at Ballyscullion, Ireland, June 18, 1854.

A. E. Doucet, M. Can. Soc. C.E., District Engineer, National Transcontinental Ry., Quebec, born at Montreal, June 9, 1860.

E. W. DuVal, Superintendent, District 3, Saskatchewan Division, C. P. R., Saskatoon, born at Toledo, Ohio, June 5, 1885.

J. M. R. Fairbairn, M. Can. Soc. C. E., Assistant Chief Engineer, Eastern Lines, C. P. R., Montreal, born at Peterboro, Ont., June 30, 1873.

W. E. Foster, Solicitor for Ontario, G. T. R., Montreal, born at Belleville, Ont., June 27, 1866.

A. A. Goodchild, General Storekeeper, Eastern Lines, C. P. R., Montreal, born at Peckham, London, Eng., June 3, 1866.

J. A. Heaman, Assistant Chief Engineer, G. T. Pacific Ry., Winnipeg, born at Memphis, Tenn., June 3, 1874.

H. W. Harding, Local Secretary, Canadian Northern Ry., London, Eng., born there June 6, 1869.

L. R. Johnson, General Superintendent, Angus Shops District, C. P. R., Montreal,

born at Abingdon, Berks., Eng., June 22, 1855.

Hon. J. D. Hazen, M.P., Minister of Marine, Ottawa, born at Oromocto, N.B., June 6, 1860.

L. K. Jones, I. S. O., Assistant Deputy Minister and Secretary, Department of Railways and Canals, Ottawa, born at Port Hope, Ont., June 9, 1849.

A. C. Lytle, Assistant Superintendent of Construction, Montreal Tramways Co., Montreal, born at Hemmingford, Que., June 6, 1854.

R. S. McCormick, M. Am. Soc. C.E., Chief Engineer, Algoma Central and Hudson Bay Ry. and Algoma Eastern Ry., Sault Ste. Marie, Ont., born at Quaker City, Ohio, June 22, 1873.

Duncan McDonald, ex-General Manager, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., June 17, 1859.

S. J. McLean, Dominion Railway Commissioner, Ottawa, born at Quebec, June 14, 1871.

J. V. McNab, Resident Engineer, C. P. R., Moose Jaw, Sask., born at Ayr, Ont., June 11, 1884.

R. F. McNaughton, Travelling Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., born at Petrolea, Ont., June 23, 1889.

C. E. McPherson, Assistant Passenger Traffic Manager, Western Lines, C. P. R., Winnipeg, born at Chatham, Ont., June 7, 1861.

W. R. MacInnes, Freight Traffic Manager, C. P. R., Montreal, born at Hamilton, Ont., June 7, 1867.

H. J. Maguire, District Baggage Agent, British Columbia Division and B. C. and Pacific Coast Service, C. P. R., Vancouver, B. C., born at Toronto, June 16, 1881.

G. Manson, Assistant to Vice President C. P. R., Winnipeg, born at Thurso, Scotland, June 8, 1863.

H. N. Merriam, Division Engineer, Pacific Great Eastern Ry., Lillooet, B. C., born at Waupun, Wis., June 19, 1874.

J. D. Morton, Assistant Comptroller, Canadian Northern Ry., Toronto, born at London, Ont., June 15, 1857.

L. Mulkern, District Freight Agent, C. P. R., Toronto, born at London, Ont., June 18, 1871.

H. A. Pepler, District Master Mechanic, C. P. R., Farnham, Que., born at Richmond, Que., June 25, 1873.

J. E. Pinault, General Superintendent, Canada and Gulf Terminal Ry., Matane, Que., born at Rimouski, Que., June 24, 1884.

F. R. Porter, Assistant General Freight Agent, Grand Trunk Pacific Ry., Winnipeg, born at Stratford, Ont., June 13, 1875.

F. Price, Superintendent of Car Service, G. T. R., Montreal, born there, June 11, 1864.

Allan Purvis, Manager Interurban Lines, British Columbia Electric Ry., New Westminster, B. C., born at Batavia, Java, June 29, 1864.

L. G. Rogers, Assistant Superintendent, Division 1, Ontario Division, C. P. R., Havelock, born at Richford, Vt., June 18, 1874.

H. H. Smith, Car Service Agent, Canadian Northern Quebec Ry., Montreal, born at Quebec, June 14, 1872.

V. G. R. Vickers, Manager, Foreign Department, and Superintendent, Atlantic Division, Dominion Express Co., Montreal, born at Toronto, June 1, 1866.

Walter White, Trainmaster, G. T. R., Palmerston, Ont., born at Toronto, June 4, 1866.

Dominion Railway Subsidy Contracts.—The Dominion Government has entered into a contract with the St. Francis Valley Ry., under the act granting aid in the construction of railways, in respect of a line from Melbourne to Drummondville, Que., 28 miles.

The Death of William Wainwright.

William Wainwright, Vice President, G.T.R., and G.T. Pacific Ry., died at Atlantic City, N. J., May 14. Although he had been in poor health during the past year, his death was, to a great extent, unexpected. He never fully recovered from a severe attack of pneumonia about two years ago, and during April he was absent from his office, and towards the end of the month decided to go to Mount Clemens, Mich., to take a course of baths. It was thought that he was considerably benefitted, and he decided to visit Atlantic City, but suffered a relapse there, and died on the day he was to have left for Montreal. By his death, is removed one of the best known railway men on the continent, his railway career extending over 56 years, 52 of which have been spent in Canada, in G.T.R. service. During that time he assisted in the complete reorganization of the G.T.R., as well as in the building of the system as at present constituted.

P277 William Wainwright.

He was born at Manchester, Eng., Apr. 30, 1840, and entered railway service there, in Jan. 1858, with the Manchester, Sheffield and Lincolnshire Ry., now the Great Central Ry., serving, successively, as junior, and senior clerk, Chief Accountant's office, secretary to Assistant General Manager, and later to the General Manager. He joined the G.T.R. staff at Montreal, in 1862, on the recommendation of Sir Edward Watkin, then Chairman of the Board, M.S. & L.R., and Superintending Commissioner, G.T.R., and was, during that year, senior clerk, Chief Accountant's office; 1863 to 1867, secretary to Managing Director; 1866 to 1872, senior clerk to Managing Director and in charge of car mileage department; 1872 to May 1881, General Passenger Agent; May 1881 to May 1890, Assistant Manager; May 1890 to May 1896, Assistant General Manager; Apr. 1883 to Sept. 1895, also General Manager, North Shore Ry.; May 1896 to July 1907, General Assistant; Dec. 1900 to July 1907, also Comptroller; July 1907 to Jan. 7, 1910, Fourth Vice President; Jan. 7, 1910 to Oct. 2, 1911, Second Vice President, G.T.R., and G.T. Pacific Ry., and on the abolition of the numerical designations of the Vice Presidents, he was appointed Vice President, with seniority over other Vice Presidents. On the death of the President, C. M. Hays, Mr. Wainwright was placed in charge of all the company's affairs, pending the appointment of a President, to which office he was the natural successor, had not his age prevented his conscientious discharge of the duties. He had for many years acted in the capacity of confidential adviser to the London board, and also had charge of all the company's parliamentary business, which, during the past few years has been heavy. In addition to his position on the G.T.R., he was officially connected with the G.T.R. subsidiary companies, and also with the Canadian Express Co., Montreal Telegraph Co., Montreal Warehousing Co., G. T. Pacific Terminal Elevator Co., St. Lambert Terminal Development Co., Mount Royal Hotel Co., Intercolonial Express Co., Richelieu and Ontario Navigation Co., and the Grand Trunk Insurance and Provident Fund. He was a justice of the peace, and was included in a list got up by a Montreal daily paper some time ago, quoting the 23 men who were the basis of Canadian finance. He was a captain in the First Brigade Garrison Artillery., G.T.R. Brigade, and saw service in the Fenian raids.

E. J. Chamberlin, President G.T.R. and G.T.P.R., said,—"He had been with the Grand Trunk for 52 years and during that long period he had always been a faithful worker, and he was not merely respected, but beloved by every one of his associates. It would be impossible to say all that he had done for the advancement of railway interests in Canada, and for the G. T. R. Personally, I feel, that I have lost, not merely a valued colleague, but a dear personal friend. The railway interests in Canada, and the country itself are the poorer for his death."

The body was brought from Atlantic City in the Vice President's private car, Canada, and the funeral took place at Mount Royal cemetery, Montreal, May 18. The G.T.R. head offices were closed during the afternoon, and instructions were issued, that at 2.30 p.m., all trains and locomotives on the G.T.R. and G.T.P.R. were to remain stationary for one minute, and all work was to cease in all shops and yards for the same period. The attendance at the funeral was very large, including representatives of all the various transportation interests, in addition to a large number of officials of the G.T.R. system, the C.P.R. being represented by a great number of its officials. Chief among those present were,—A. W. Smithers, Chairman of the Board, G.T.R., who had just arrived from England; E. J. Chamberlin, President, G.T.R. and G.T.P.R.: Sir Thomas Shaughnessy, President, C.P.R., R. B. Angus, director, C.P.R., Jas. Carruthers, President, Canada Steamship Lines, and Jas. Mills, one of the Board of Railway Commissioners. There were also present, H. A. White, chief clerk to Superintendent of Car Department, G.T.R., and W. S. Rollo, Joint Agent, G.T.R. and Central Vermont Ry., St. Johns, Que., two of the oldest G.T.R. employes still in active service, they having entered the service in 1865 and 1866, respectively; and also a number of retired employes, some of whom were in the service before Mr. Wainwright joined the staff.

The International Railway Fuel Association's annual convention was held at Chicago, Ill., May 18 to 21, when a number of papers, dealing with railway fuel matters, were read and discussed.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—Edmonton, Alta., press reports state that active work was started on this line at the point of junction with the Edmonton, Dunvegan and British Columbia Ry., April 27. Location plans for the first 180 miles of the line have been filed with the Alberta Department of Railways. It is expected that track will be laid to Lac la Biche by Dec. 31. W. R. Smith, who is Chief Engineer of the Edmonton, Dunvegan and British Columbia Ry., and of the Central Canada Ry., is Chief Engineer of the A. and G. W. Ry. also, all three lines being built by the J. D. McArthur interests. The E., D. and B. C. Ry., is to connect at the Alberta-British Columbia boundary with the Pacific Great Eastern Ry. (May, pg. 213.)

The Burrard Inlet Tunnel and Bridge Co.'s officials stated, May 4, that the British consulting engineers who prepared plans for the proposed bridge across the Second Narrows of Burrard Inlet, for which tenders were recently received, had agreed to withdraw from the contract owing to the fact that the tenders on their plans were not such as could be accepted. The directors are now considering the alternative plans submitted, and it is expected that one of them will be accepted. (May, pg. 213.)

Calgary and Fernie Ry.—We are officially advised that F. Crandell, Calgary, Alta., is General Manager of this projected railway. (May, pg. 213.)

Dominion Atlantic Ry.—Rapid progress is being made with the bridge renewal and strengthening work. The principal bridges on which work is being done are at Windsor, and across Bear River, near Annapolis, N. S. It is expected that the work will be completed by August. T. Cozzolino is the contractor. (May, pg. 213.)

Esquimalt and Nanaimo Ry.—A new steel viaduct on concrete pedestals and columns has been completed over the Arbutos Canyon, Vancouver Island, replacing a timber trestle. It was built by the Canadian Bridge Co. This is about the last of the timber bridges and trestles on the original E. and N. R., to be replaced.

The bridge across the Tsable River on the Courtenay extension is expected to be completed early in June, when track laying will be continued to the Trent River, where another bridge is under construction. When this is completed track can be laid into Courtenay. The ballasting gang is following close after the track laying. The terminal and other buildings at Courtenay are well advanced and are all expected to be completed by the time the track reaches the place in the fall. Shields and Newburn, Victoria, B. C., are the contractors for the buildings. (May, pg. 213.)

Ha Ha Bay Ry.—Although the Quebec Legislature has authorized the amalgamation of this company with the projected Roberval and Saguenay Ry., we understand that the amalgamation has not yet taken place, although the lines built by the H. H. B. Ry. are being operated under the title of the Roberval and Saguenay Ry.

The H. H. B. Ry. has 36.18 miles of line in operation, consisting of a line from Ha Ha Bay Jct., on the Quebec and Lake St. John Ry. to the Dominion wharf at Bagotville, about 20 miles; a branch to Chicoutimi, 3.5 miles; a branch to Lake Kenogami, 12 miles; and a branch to St. Alexis, one mile. The branch to Chicoutimi is operated by electricity. We are advised that no new railway work is being gone on with. A survey has been made for an extension of the line from Ha Ha Bay across the Saguenay, up around the north side of Lake St. John to the Mistassini River, about 70 miles. Nothing, however, has been done towards financing this construction. (Jan., pg. 21.)

Intercolonial Ry.—A large amount of work is reported to have been done on the new ocean terminals under construction at Halifax, N.S. The principal work consists of filling in and reclaiming from the water an area of about 200 ft. by 220 yards, necessitating the dumping of over 100,000 cubic yards of material. The cut for the branch line has been extended as far as Tower Road. The work in progress from Fairview towards the terminals has now reached a point between Mumford Road and Bayer's Road. The pier construction work, for which the contract was let to Foley Brothers, Welch, Stewart and Fauquier, has been started, and a sub-contract for dredging has been let to the Poupore Dredging Co., Montreal.

The acting Minister of Railways informed the House of Commons, May 6, that the contract for the construction of the branch line from Dartmouth to Dean's Settlement, N. S., 73 miles, was let to M. P. and J. T. Davis, Feb. 16, 1914, at schedule rates, aggregating $1,740,277.98. The original contract had not been sublet.

Engineers have been making a survey for a diversion of line to overcome the present heavy gradient between Amherst and Nappan, N.S. The diversion will probably start, local reports state, a little west of Amherst, and rejoin the main line near Blair's Lake.

A spur line is under construction into Pugwash, N.S., and is expected to be opened for freight traffic, early in July.

A contract is reported to have been let to Rhodes, Curry Co., Amherst, N.S., for the erection of nine steel bridges in Quebec and Nova Scotia. Tenders were received to May 27 for the substructures for 14 steel bridges in Nova Scotia, New Brunswick and Quebec. Tenders were also received to May 27, for a 40,000 gal. water tank at Jacquet River, N.B.; extensions to the freight sheds at Bathurst and Millerton, N.B., and Matapedia, Que.; and for the erection of a passenger station, freight room and dwelling at Perpetue, Que. (May, pg. 213.)

Kettle Valley Lines.—Good progress is being made with construction on the section of the line from Osprey Lake to Princeton, B.C., the completion of which for the tracklayers is called for by Oct. 1. At Princeton the line will join the Vancouver, Victoria and Eastern Ry., and trains will run over that company's tracks, under a joint agreement, to the Coquihalla Summit, near Otter Creek. The K. V. Lines' route thence to Hope is under construction to be jointly operated with the V. V. and E. Ry. Over 50% of the grading on this section is completed, and there is only a three mile length on which work is not in progress. The contract calls for the completion of this section Dec. 1. Three of the piers of the bridge over the Fraser River at Hope, which is to give connection with the C.P.R., were reported completed May 6. The contract for the erection of the superstructure has been let to the Canadian Bridge Co., but it is not expected that the erection of this will be started until the track has been laid to the western approach. (May, pg. 214.)

Labrador, Quebec and Southern Ry. Co.—The House of Commons Railway Committee has changed the name of the proposed company, whose promoters asked for incorporation as the All Red Line Ry. Co., to the above; defined the line to be built as from Cape St. Charles, via Lake St. John, to Quebec, instead of from the Labrador coast to the Pacific Ocean; and reduced the capital from $100,000,000 to $10,000,000. Questions were asked in the House of Commons as to the standing of the promoters, and the acting Minister of Railways stated that F. A. Knapp, father-in-law of E. J. Holland, one of the incorporators mentioned in the bill, has formed him that "Mr. Gould, of New York, and several other capitalists were interested in the project, and that there was sufficient backing to build the line from the Labrador coast to Quebec." Some discussion took place as to the differences between Canada and Newfoundland in regard to the Labrador coast, and it was decided to let the bill stand in order that this might be looked into. (See All Red Line Ry., April, pg. 165.)

Lake Erie and Northern Ry.—A special train ran over the completed line from Brantford to Galt, Ont., May 4, about 20 miles. The completed line starts at Jubilee Terrace in Brantford, and runs into Galt as far as the C.P.R.

The further construction of the line in Brantford is being held up pending a decision on the question of the raising of the Lorne Bridge. The plans for this were submitted to the city, May 8, when certain objections were made, and will be laid before the Board of Railway Commissioners. Construction is being proceeded with rapidly on the section south from Brantford to Port Dover.

It is expected that the Brantford-Galt line will be put in operation early in August. (May, pg. 214.)

Miramichi Bay Shore Ry.—The New Brunswick Legislature has incorporated a company with this title, to build a railway along the shores of Miramichi Bay to serve Newcastle, Chatham and other points. (May, pg. 24.)

North Ry.—Press reports state that a contract will be let on an early date for the building of the first section of this projected railway from Montreal to a junction with the National Transcontinental Ry. at the Bell River crossing, Que. Surveys are being made for the second section of the line from the Bell River to Hudson Bay. F. H. Clergue, Montreal, is President, and C. J. Smith, Vice President and General Manager. (Feb., pg. 70.)

North Shore Ry. and Navigation Co.—The New Brunswick Legislature has granted an extension of time for the building of the uncompleted portions of this railway, in the vicinity of Beersville, N. B. (Jan., 1913, pg. 21.)

North Western Ry. Co. of Canada.—The bill asking for the incorporation of the North Western Ry. Co. of Canada was withdrawn from further consideration in the Dominion Parliament, May 13.

Pacific and Hudson Bay Ry.—W. R. Jenkins, described as General Purchasing and Right of Way Agent, visited Edmonton, Alta., recently, and is reported to have stated that he was on his way to Grouard, and other northern points, with a view of looking over the territory through which the company's projected line would pass, that the Pacific terminal will be at Bella Coola, that the line will run easterly through a comparatively rich country to the Pine Pass, and will then turn northerly to Lesser Slave Lake, that the original preliminary surveys showed a line passing along this lake by the N. W. ¼ sec. of sec. 15, tp. 75, range 14 west of the 5th meridian, about half a mile east of Grouard, and that something in the way of construction will probably be arranged for within the next few months. (May, pg. 214.)

Pacific Great Eastern Ry.—Tracklaying is reported to have been started at Dundarave, B.C., to which point the line is at present in operation from North Vancouver, 4.5 miles, in the direction of Horseshoe Bay. The bridge gangs are working well in advance of the steel, the rails being rafted down to them. It is expected to have track laid to Horseshoe Bay early in July. Track has been laid from Squamish for 20 miles, and grading is practically completed thence to Lillooet, mileage 120 from Squamish. Between that point and Kelly Lake grading is well advanced, and the following sub-contracts are reported to have been let on the line between Fort George and Kelly Lake, in addition to those mentioned in our May issue:—Heckman and Moore, 10 miles near Clinton; Welch and Kennedy, four miles; Rankin and Kellett, 20 miles; Maddox Bros., six miles. The quantities on the subcontract let to A. E. Griffin & Co., Fort George, referred to in our May issue, are:—Earth excavation, 1,000,000 cubic yards; rock excavation, 500,000 cubic yards; embankment, 1,500,000 cubic yards. (May, pg. 214.)

Pacific, Peace River and Athabasca Ry.—C. F. Law, who represents the British interests behind this company in Vancouver, B.C., is reported to have stated, May 4, that an engineering party was leaving that city shortly for Athabasca Landing, Alta., for the purpose of exploring the country west to the Pacific coast. The first section of the railway to be built will probably extend from the Naas River to the coal fields in the Ground Hog River valley. It is said surveys for this line are to be undertaken at once, and it is expected that the location plans will be ready in the autumn. It is also said that it is expected to start surveys from Prince Albert, Sask., and from the Peace River crossing, Alta., this year. (May, pg. 214.)

Peace River Ry.—Application is being made to the Alberta Legislature for the incorporation of a company with this title to build a railway from Grand Prairie to Fort Vermillion, Alta. Griesbach, O'Connor & Co., Edmonton, Alta., solicitors for applicants.

Peace River Tramway and Navigation Co.—C. F. Law, Vancouver, B.C., who is also interested in the Pacific, Peace River and Athabasca Ry., is reported to have said in Vancouver, May 11, that the company's plans call for the completion next year of the two sections of railway authorized to be built. It was proposed to put three shallow draught steamers on the lake and river navigation which the lines will open up. (April, pg. 166.)

Pointe aux Trembles Terminal Ry.—The Board of Railway Commissioners has authorized the company to build its tracks across the Montreal Terminal Ry. in Pointe aux Trembles, Que. We are officially advised that this railway will be built entirely on the Canada Cement Co.'s property, except where it crosses the Montreal Terminal Ry., and the Canadian Northern Quebec Ry. tracks, and Notre Dame St. East. The greater part of the line has been built, and is merely ordinary construction, presenting no features of engineering interest. It is to be used entirely for the Canada Cement Co.'s purposes. A. C. Bedford Jones, Montreal, is secretary. (July, 1913, pg. 332.)

Prince Edward and Hastings County Ry.—In the passing through the House of Commons of the bill granting the company an extension of time for construction of the line from Trenton to Belleville, Ont., with branch lines, and authority to build from Brighton to Picton, Ont., it was stated that the principal line to be built will extend from Brighton to Belleville, and will run through Kingston. The distance from Brighton to Kingston, via Picton, is 72 miles, and it is proposed to build a bridge at Glenora.

Local press reports state that the company, although consisting of Prince Edward County men, is being organized in C. P. R. interests. The starting point, Brighton, is on the Campbellford, Lake Ontario and Western Ry., which is being financed by the C. P. R., and will be operated by it. The new line would run through a district which the C. P. R. only touches by its Kingston and Pembroke branch. (Mar., pg. 122.)

Prince Edward Island Ry.—The contractors for the building of the car ferry terminals at Carleton Point, P.E.I., are reported to be making rapid progress with the work. At the quarry in New Brunswick, from which stone will be taken, tracks have been laid to the I.R.C. Pointe du Chene Branch, at the terminal of which, the small cars are put on scows and towed across to Carleton Point. A dry dock 125 by 47 ft. has been located at Pointe du Chene, N.B., where the cribs for the piers are being built. The houses and other buildings for the men to be employed at Carleton Point are nearly completed, and everything is about ready for an actual start to be made on the piers, etc., for the terminals. It is expected that about 1,250 tons of stone will be shipped daily from the quarries. Roger Miller & Co., the contractors, have the following plant on hand: Two locomotives, 26 flat cars, steam shovel, derricks, a 600 ft. cableway hoist, and miscellaneous machinery at the quarries; one 500 h.p. ocean going tug; one small tug; two scows of 1,000 tons capacity each; two derrick scows of 500 tons capacity each, at Pointe du Chene, and the usual construction plant at Carleton Point. The following are in charge of the work:—Roy Miller, representing the firm; E. A. Gibson, Chief Engineer; John Bradley, at the quarry; T. Barrett, at Carleton Point; W. King, in charge of the concret work; H. Laframboise, marine foreman, while F. B. Fripp is engineer in charge for the Dominion Government. A track has been laid to the terminal site at Carleton Point from the P.E.I. Ry., and a permanent line will be completed later. Roger Miller paid a visit recently to the work, and is reported to have said that construction would be rushed as fast as possible and he expected to see trains running to the terminal in about a year. The above is a summary of a lengthy special article appearing in a recent issue of the Moncton Times. (May, pg. 215.)

St. John and Quebec Ry.—The New Brunswick Legislature has provided for a further issue of guaranteed bonds for $10,000 a mile in aid of the construction of this line from Grand Falls to St. John. In the course of the session charges were made that the railway was not being built in accordance with the original plans and specifications; that payments had been made to members of the Government by contractors to secure contracts, and that the line was not costing the amount claimed by the company. The name of the Premier was mentioned in connection with the matter. In consequence of this and other allegations, the Premier obtained leave of absence from office, and an act was passed authorizing the Lieutenant Governor to appoint a Royal Commission to hold an enquiry into the whole matter. The members of the Commission, appointed on May 5, are Judge McKeown, ex-Judge Wells and W. D. Fisher.

F. B. Carvell brought the matter before the House of Commons, April 28. He stated that while the cost of the line was sufficient to justify the payment of the Dominion subsidy of $6,400 a mile, it was being built with gradients exceeding the 0.4% and 0.6% and with curves of seven degrees, and otherwise not in accordance with the specifications prepared at the time the agreement was made under which the Railways Department undertook to operate the line on completion for 60% of the gross receipts. He also stated that the special legislation granting an additional $10,000 a mile of guaranteed bonds had been put through the Legislature largely on the strength of a statement that the Dominion Government had promised to increase the amount voted for building certain bridges, from $1,000,000 to $3,000,000. He suggested that if this was the case the Department should itself build the bridges instead of paying the money over to the company. The acting Minister of Railways stated that the Department, before taking over the line for operation must see that it is built in accordance with the special agreement. The Department could only protect itself in so far as the payment of subsidies is concerned, and there was no doubt from Mr. Carvell's statement that the line was costing a sufficient amount to justify the payment of the $6,400 a mile. The matter of the bridges was under consideration, and all he need say was that the Department would protect itself in a satisfactory manner. (May, pg. 215.)

The acting Minister of Railways introduced a resolution in the House of Commons, May 16, providing for the ownership by the Government of the three bridges to be erected on this railway. When completed the line is to be operated under lease by the Intercolonial Ry.

Saskatchewan Central Ry.—F. S. Cahill, Saskatoon, Sask., one of the provisional directors of this company, the application of which for an extension of time for construction has been the subject of considerable controversy in the Dominion Parliament, is reported to have stated that $75,000 of the capital had been subscribed for preliminary expenses, including the obtaining of the charter, and that nothing further had been done. He did not think it likely that any steps would be taken this year in the way of financing construction. (Jan., pg. 22.)

Seymour Narrows, B. C.—The City of Victoria, B. C., proposes to send a deputation to Ottawa to urge upon the Government the necessity of making an appropriation for the purpose of having adequate surveys made for the construction of the projected bridge across Seymour Narrows, with the necessary connection of railways on Vancouver Island and the mainland.

Toronto, Hamilton and Buffalo Ry.—We have been officially advised that the company is not contemplating increasing its yard accommodation at Brantford, Ont., at present, as stated in recent press reports.

A meeting of the ratepayers of Dunnville, Ont., was held May 13, when a resolution was passed asking the Town Council to pass a bylaw to raise sufficient money to provide the right of way for the building of a branch of the T. H. and B. Ry. into the town from Smithville. The estimated cost of the right of way is about $40,000, and it was reported that arrangements had been made with practically all the owners. The Mayor stated that the company was ready to start the building of the branch at once, and to complete it by the end of the year; that the station and yards would be at the corner of Bridge and Canal streets; that $30,000 would be spent on the passenger station, and $10,000 on a brick freight shed. A committee was appointed to interview the company and to enter into an agreement for the building of the branch. (May, pg. 215.)

We are officially advised that it has been decided to instal the A. P. B. automatic block system between Hamilton and Brantford, the work to be done by the General

Railway Signal Co. It will be similar to the installation between Vinemouth and Welland.

St. Francis Valley Ry.—A contract has been entered into under the act granting aid to certain railways, between the company and the Dominion Government for the building of a line from Melbourne to Drummondville, Que., 28 miles. (May, pg. 215.)

Vancouver Ry. and Ocean Terminal Co.—The Vancouver City Council was advised, April 30, that the company had withdrawn its application to the Dominion Parliament for a charter of incorporation. (April, pg. 167.)

Western Dominion Ry.—In the House of Commons Committee of the Whole, May 8, when the bill respecting the W. D. Ry., and the Alberta Pacific Ry. came up, the acting Minister of Railways stated that he had been informed that the contract for the line had been signed, and that arrangements had been made for financing construction in England. He had no information, however, as to when construction would be started. The subsidy agreement with the company called for the building of 100 miles towards the International Boundary. The bill as passed by the House grants an extension of a year within which construction is to be started. (April, pg. 167.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Caustic Soda and Bleaching Powder Rates.

21686. April 22. Re complaint of Canadian Manufacturers' Association against commodity rates on caustic soda and bleaching powder, in car loads, shown in supplement 14 to G.T.R. Tariff C.R.C. no. E 2855, effective from Sandwich, Ont., April 23; Supplement 5 to Michigan Central Rd. Tariff C.R.C. no. 2049, effective from Windsor, Ont., April 23; and Pere Marquette Rd. Company's Tariff C.R.C. no. 1757, effective from Sandwich, April 18, it is ordered that the said schedules of the G.T.R. and Michigan Central Rd., in so far as they increase the rates now being charged on caustic soda and bleaching powder, be suspended sine die. And it is further ordered that the said schedule of Pere Marquette Rd., in so far as it increases the rates heretofore charged on caustic soda and bleaching powder, be disallowed. And it is also ordered that the rates lawfully in force on the said commodities immediately prior to the effective dates of the said schedules be continued in effect until further order.

Seat Fares in British Columbia.

21716. April 30. Re complaint of R. L. Rice, of Vancouver, against charge made by C.P.R. for two seats in a sleeping car for a daylight journey from Sicamous, B.C., to Vancouver. It is ordered that the complaint be dismissed.

Maple Butter Classification.

21745. May 2. Re application of Maples, Limited, of Montreal, for a rating on maple butter in Canadian Freight Classification of third-class, in less than carloads, and fifth-class in carload lots, or in mixed cars with syrup. It is ordered that the classification of maple butter be made the same as the classification of peanut butter, the change to be included in Supplement 3 to Canadian Freight Classification 16.

Clay Rates in Carload Lots.

21746. May 4. Re application of the Dominion Sewer Pipe Co. and the Ontario Sewer Pipe Co. for an order cancelling Supplement 146 to G.T.R. Special Tariff, C.R.C no. E-2552, increasing the rate on clay, in carload lots, from Waterdown to Swansea and Mimico, Ont., 1½c per 100 lbs. to 2c per 100 lbs. It is ordered that the said supplement be disallowed, and the rate of 1½c per 100 lbs. be restored.

Sugar Rates in Carloads.

21781. May 7. Re application of Dominion Sugar Co., of Wallaceburg, Ont., for a readjustment of rates on sugar, in carloads, from Wallaceburg to Toronto and Hamilton, over the Pere Marquette, Chatham, Wallaceburg and Lake Erie, Grand Trunk and Canadian Pacific Railway lines, and order 20136, Aug. 11, 1913. It is ordered that the joint commodity rates of the Chatham, Wallaceburg and Lake Erie Ry. and the Pere Marquette Rd., in connection with the Grand Trunk and Canadian Pacific Railways, for carriage of sugar, in carloads, from Wallaceburg, to Hamilton and Toronto, be reduced to 10½c per 100 lbs., and 11½c per 100 lbs. respectively, on a minimum weight of 40,000 lbs. per carload, the said reduced rates to be made effective not later than May 25.

Essex Terminal Railway.

21786. May 8. Re order 21541, March 25, suspending tariffs and supplements applicable to international traffic, filed by the G.T.R., Michigan Central Rd., the Wabash Rd., the C.P.R., and the Pere Marquette Rd., also tariffs and supplements filed by other companies in which the aforesaid railway companies, or any of them, are or is shown as participating carriers, or carrier, removing the Essex Terminal Ry. from the joint tariffs, at present in effect, as a party thereto, under concurrences filed by the said Essex Terminal Ry. It is ordered that the said tariffs and supplements be disallowed.

Lumber Rates to Montreal.

21789. May 12. Re the following tariffs, Supplement 51 to C.R.C. no. E-2318 of G.T.R.; C.R.C. no. E-2779 of C.P.R., and C.R.C. no. 419 of Canadian Northern Ry., increasing rates on lumber to Montreal for export; also G.T.R. Supplement 49 to C.R.C. no. E-2318, and C.P.R. Tariff, C.R.C. no. E-2777, showing the said companies' summer rates on lumber to Montreal for local delivery. Upon the complaint of the Canadian Lumbermen's Association and the Montreal Board of Trade against the proposed increased rates, it is ordered that with respect to the lines of the Grand Trunk, Canadian Pacific, and Canadian Northern Railways, or either of them, between Montreal and Ottawa, and between Montreal and Hull, including the Point Fortune, Hawkesbury and Rockland branches, also between Hull and Waltham, Hull and Maniwaki, and Ottawa and Pembroke, all termini inclusive, order 21621, April 19, be invalidated by the publishing and filing of tariffs by the said companies, under the provisions of sub-section 2 of section 328 of the Railway Act, to take effect not later than one week from the issuance of this order, to apply on lumber to Montreal, for export, reinstating the rates charged during the season of 1913 from those stations whence the "export" rate has been made the same as the "domestic" in the tariffs suspended by order 21621, which tariffs shall thereby be superseded in so far as they conflict with this order. And it is also ordered that the complaint against the increased rates to Montreal for local delivery be dismissed.

The Board of Railway Commissioners' Interswitching Rules.

Chief Commissioner Drayton gave the following decision recently:—

The C.P.R. and G.T.R. Companies were required by the Board to show cause, at the sittings held on April 7, why the terms of the General Interswitching Order should not be extended to the use of team tracks. This action was taken by the Board as the result of the issuance of C.P.R. circular O.D.N.O 954, addressed to agents and shippers, as follows:—"It has been the practice in the past in Toronto, and then only in some instances, to switch cars from connecting lines for team track delivery. Effective April 1, this practice will be discontinued. This does not affect the switching of cars to private sidings under the terms of our tariff N.O.E. 262."

The whole question of interswitching and local switching has been at loose ends for a long time. The Board's General Interswitching Order was made on July 8, 1908, the order being made by the Board as composed of the late Chief Commissioner Mabee, Mr. Bernier, and Commissioner Mills. Prior to the issuance of this order, railway companies at certain points were interswitching as a matter of agreement and perhaps mutual accommodation, and as a matter of Board direction at London, Lindsay, New Westminster and Rossland.

It is claimed by shippers that at first the railway companies construed the order as covering movements not only to private sidings, but also to team tracks, and probably for this reason the C.P.R. made its application to the Board to reopen the London interswitching case. This application was heard at Toronto, in Jan., 1909, and was for an order rescinding the London order, fixing the rate to be charged for the interchange of traffic and the interswitching of cars over the G.T.R. branch line, and connecting the G.T.R. and C.P.R. lines at London.

Mr. Mabee, in his judgment delivered Nov. 27, 1911, states:—"The ground upon which the application is based is that, on July 8, 1908, effective Sept. 1, 1908, the Board, by its general interswitching order, established certain tolls for interswitching generally within certain limits. The tolls that would be payable by the C.P.R. to the G.T.R. for interswitching at London would be less under the general order than those payable under the special order of July 25, 1905. It may as well be said at the outset that, when the investigation was being held that led up to the making of the general order, the London situation was not present to my mind, and it was not intended that the order covering interswitching there should be interfered with by the general order. The companies have so regarded the matter. Hence this application for rescission of the London order, which would leave the general order applicable."

The application was refused on the ground that the C.P.R., under the London order, enjoyed rights greater than those given by the general order, and the London order placed at the disposal of the C.P.R. every G.T.R. track in London except shed tracks. The distinction of facilities covered as between one order and the other consists of team tracks. In the opinion, therefore, of the late Chief Commissioner, the general order did not include team tracks. This judgment was concurred in by Commissioner Mills, who was also a party to the making of the original order.

A further ruling was made on Feb. 3, 1912, to the effect that the interswitching order deals only with the tolls payable, and was

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never intended to compel one railway to turn over its entire terminals to another or others. Notwithstanding the rulings of the past, the railway companies, as evidenced by the circular issued by the C.P.R., and already referred to, have at least in part carried on interswitching so as to include team track deliveries. There is no doubt that team tracks do constitute, as has in the past been found by the Board, terminals of the respective companies, and it well may be that the Commission should not enable one company to carry on its business by the use of the terminals of another, and that, if such a principle was adhered to, general business would suffer largely, as no company would be able to get the slightest advantage in putting in expensive modern terminals, giving the shippers an advanced or accelerated service, if their facilities could be made use of by any other company.

The question is too large a question, in view of the considered judgments of the Board, to deal with at the present time. The companies have been directed to furnish the Board with such information as to cost of movement and the effect of an order which would include team tracks as well as private sidings. Notwithstanding this position, I am of the view that the circular issued by the C.P.R. is not effective. The C.P.R. has issued its tariff no. E-2646, applying to lines Fort William, Ont., and east thereof. It is a special freight tariff covering local switching, interswitching and absorption of switching charges on carload traffic, and applying to and from stations therein mentioned, including, among many others, Toronto. The tariff states that traffic forwarded under switching rates as published therein will not be handled through company's warehouses or freight sheds, but must be taken delivery of direct from cars on private sidings or public team tracks. This notation is on the face of the tariff, and as interswitching traffic is carried at switching rates just as truly as local switching is, covers the movement in both cases. Sec. 1 deals with the scale of local switching charges, and sec. 2 with interswitching charges at junction points. In neither case are team tracks excluded.

In my view, therefore, a switching movement is provided for by tariff properly issued and filed. The companies cannot, under the terms of the act, decline traffic properly offered to them under these tariffs and within the terms of the tariffs, as I hold team tracks to be, until proper notice of cancellation has been given. As the cancellation of these tariffs will mean that the traffic will move at higher tolls, the result is that the cancellation cannot be effective until 30 days after its publication.

Canadian Railway Club.

The annual meeting was held at Montreal, May 12. The report of the Secretary, Jas. Powell, showed that 112 new members joined during the year, and 88 had resigned or been struck off the roll, and 4 had died, leaving a total membership of 820. There was a slight decrease in the surplus, owing to the increased cost in entertainment and also to the expenditure of $250 for the incorporation of the club. This was effected under the Quebec law in order to protect its name being appropriated by any other association. The Treasurer, W. H. Stewart, reported receipts of $7,832, with disbursements of $4,705, leaving a balance to be carried forward of $3,126.

The retiring President, R. W. Burnett, Master Car Builder, C. P. R., was presented with a past president's medal. Following are the officers for the current year:—President, W. McNab, Principal Assistant Engineer, G. T. R.; First Vice President, L. C. Ord, Assistant Master Car Builder, C. P. R.; Second Vice President, R. M. Hannaford, Assistant Chief Engineer, Montreal Tramways Co.; Secretary, Jas. Powell, Chief Draughtsman, G. T. R.; Treasurer, W. H. Stewart, C. P. R. Executive Committee, Prof. H. O. Keay, McGill University; E. E. Lloyd, Auditor of Stores, C. P. R.; J. Hendry, Master Car Builder, G.T.R.; C. Manning Secretary to Superintendent of Motive Power, G.T.R.; E. B. Tilt, Engineer of Tests, C.P.R.; Geo. Smart, Master Car Builder, I.R.C., Moncton, N.B.

Great Northern Railway Lines in Canada.

Midland Ry.—Midland Great Northern Ry.—The Winnipeg Board of Control decided May 12 to apply to the Board of Railway Commissioners for an order directing the lines used by these companies on Portage Ave. to be elevated. This decision was arrived at upon a report of the City Engineer as to the cost of a subway.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—J. H. Kennedy, Chief Engineer, returned to Vancouver, recently, from a trip of inspection over the section under construction. The section from Coalmount to the junction with the Kettle Valley Line, near Otter Creek Summit is well advanced. This section, together with the section from Princeton to Coalmount, is to be utilized jointly with the K. V. Lines, under the agreement ratified last session of the British Columbia Legislature. The section of the K. V. Lines in construction of the above, to Hope, under consideration by that company is to be used jointly with the V. V. and E. Ry.

Vancouver Terminals.—L. W. Hill, President, G. N. R., is reported to have stated recently that the company's appropriations for this year include over $1,000,000 for the laying out of the terminals at False Creek, Vancouver, and for the building of the station there. If the city insisted on the immediate construction of the four east end viaducts, which would mean an expenditure by the company of $450,000, it would cut heavily into the appropriation. He did not think that the viaducts were necessary, however desirable they might have been at the time the new docks were being built and the tracks were crowded with construction traffic. Apart from that traffic, which had ceased, the regular traffic was not so great as it was. Mr. Hill subsequently had a conference with the Mayor and the city officials on the matter. It is said that an understanding had been arrived at and that the Union Construction Co., to which the city had let the contract, will go on with the work at once.

A recent press report stated that the estimated cost of the projected tunnel from Burrard Inlet to False Creek, which would have a length of 3,790 ft., would be $628,970. We were officially advised, May 12, that the company has no intention to build any tunnel at that point. (April, pg. 174.)

Telephone Train Dispatching in Canada.—A table, which has been prepared regarding telephone train dispatching in North America, and corrected to May 1, gives the following details of Canadian railways:—C.P.R., total mileage, 14,184; mileage operated by telegraph, 7,710; mileage operated by telephone, 6,121; telephone mileage increase during previous 12 months, 1,311; G.T.R., total mileage, 4,765; mileage operated by telegraph, 2,711; mileage operated by telephone, 2,076; G.T. Pacific Ry., total mileage, 3,170; mileage operated by telegraph, 305; mileage operated by telephone, 2,543.

Mainly About Transportation People.

R. B. ANGUS, director, C. P. R., returned to Canada, early in May, after completing a trip round the world.

Hon. F. D. MONK, a former Minister of Public Works, died at Montreal, May 15, after a prolonged illness.

G. M. BOSWORTH, Vice President, C.P.R., sailed from Montreal, May 14, for a short stay in England.

MRS. GEO. D. PERRY, wife of the General Manager, Great Northwest Telegraph Co., died in Toronto, May 15.

W. H. C. MUSSEN, with Mrs., and Miss Mussen, have left Montreal, for Dorval, their summer residence.

CY WARMAN, of the G.T.R. General Advertising Department, Montreal, who died recently, left an estate of only $489.05.

A. C. MORRIS, Secretary Treasurer, Ontario Wind Engine and Pump Co., died recently in Toronto, in his 50th year.

A. R. CREELMAN, K. C., director, C. P. R., and Miss Creelman, returned to Montreal, during May, from a six weeks trip to California.

E. N. BENDER, General Purchasing Agent, C. P. R., and Mrs. Bender, left Montreal at the end of May, for their summer home at Dorval, Que.

O. L. DICKESON, President, White Pass and Yukon Route, left Chicago, Ill., during May, for Vancouver, B. C., his summer headquarters.

R. W. REFORD, of the Robert W. Reford Co., and Miss Reford, who have been in Europe for the past six months, returned to Montreal early in May.

SIR EDMUND OSLER, director, C. P. R., who had congestion of the lungs, at Hot Springs, Va., recovered and returned to Toronto during May.

T. H. SUMNER, Superintendent of Water Service, Michigan Central Rd., St. Thomas, Ont., died there, May 5, aged 52. He had been in M. C. R. service for 25 years.

HON. F. COCHRANE, Minister of Railways and Canals, returned to Ottawa, May 18, after a trip to Europe, much benefitted in health.

WM. APPS, at one time Master Car Builder, C.P.R., Montreal, who died in Toronto recently, left an estate valued at $60,387.

JAMES THOM, Manager, White Star-Dominion Line, Montreal, who has been ill for some time, was reported recently to be improving in health.

R. M. J. McGILL, Chief Accountant, National Transcontinental Ry. Commission, Ottawa, died there suddenly, Apr. 28, aged 52. He was born at St. John, N.B.

OWEN CAMERON, Freight Claim Agent, Canadian Government Railways, Moncton, N. B., attended the convention of the Freight Claim Association, at Galveston, Tex., May 13.

GEORGE HAM, of the C.P.R. headquarters staff, Montreal, has been appointed an honorary lieutenant-colonel, attached to the Intelligence Branch of the Militia Department.

W. Henry, who died at Montreal, May 18 , aged 81, was father of THOMAS HENRY, Operating Superintendent Passenger Steamers, Canada Steamship Lines, Ltd., Montreal.

F. P. GUTELIUS, General Manager, Canadian Government Railways, received painful injuries to his face, in attempting to board a street car while it was in motion, at Montreal, May 14.

P. WELCH, of Foley, Welch and Stewart, railway contractors on the Pacific Great Eastern Ry., etc., has recovered from his recent serious illness, and intends to resume business shortly.

It is proposed to establish a professorship of railroading at Harvard University, to be known as the J. J. Hill Foundation, as a compliment to J. J. HILL, formerly President, Great Northern Ry.

W. J. CAMP, Assistant Manager of Telegraphs, C. P. R., and Mrs. Camp, left Montreal, May 8, for New Orleans, La., where they attended the annual convention of the Association of Railway Telegraph Superintendents.

The Winnipeg School Board has decided that the name of the new school is to be built at Powers St. and William Ave. shall be Sir William Whyte, in memory of the late Director and formerly Vice President, C.P.R.

J. W. BARNETT, whose appointment as Travelling Tariff and Weighing Inspector, Intercolonial Ry., Moncton, N. B., was mentioned in our last issue, was, prior to that appointment, secretary to the General Traffic Manager.

SIR THOMAS TAIT, President, Fredericton and Grand Lake Coal and Ry. Co., is interested in the British Canadian Film Co., which has been incorporated to supply kinematograph photographs of Canadian scenes for moving picture theatres.

J. C. GARDEN, Master Mechanic, G. T. R., Battle Creek, Mich., has been presented by the Central Railway and Engineering Club of Canada, Toronto, with an honorary past president's jewel, in view of the services he rendered the club in its earlier stages.

D. A. STORY, General Freight Agent, Canadian Government Railways, Moncton, N. B., was in Washington, D. C., during May, where he represented the Intercolonial Ry., in the hearing of some cases before the Interstate Commerce Commission.

J. R. W AMBROSE, Chief Engineer, Toronto Terminals Ry. Co., and until recently Engineer in Charge, Grade Separation, G.T.R., addressed the Toronto branch, Canadian Society of Civil Engineers, at luncheon recently on the grade separation project and union station for Toronto.

J. S. DENNIS, Assistant to the President, and in charge of the Department of Natural Resources, C. P. R., Calgary, Alta., has been appointed one of a committee of three, to draft a tentative programme for the International Irrigation Congress at Calgary, Oct. 5 to 9.

J. F. DOLAN, District Passenger Agent, Canada Steamship Lines, Ltd., Boston, Mass., who was in Montreal May 2, with the object of moving his family to Boston, was presented with a walrus travelling bag, and a gold fitted chatelaine for Mrs. Dolan, by the company's Montreal staff.

J. G. STEACY, who died at Brockville, Ont., May 8, aged 77, was, in his early life, associated with his father in the erection of passenger stations, engine shops, etc., for the G. T. R., and was the senior partner of the J. G. Steacy Co., which built the first 50 miles of the European and North American Ry. running out of St. John, N. B.

DUNCAN McMARTIN, who died at Toronto, May 2, was several years ago, with his brother, engaged in railway contracting in the U. S., and later, carried out contracts on the Crowsnest Pass section of the C. P. R., the Algoma Central and Hudson Bay Ry., and the Timiskaming and Northern Ontario Ry.

A press report states that among the bequests of a public nature made by the late SIR WILLIAM WHYTE, are substantial donations to Manitoba College, General Hospital and Knox Church, Winnipeg, in addition to a personal bequest to Rev. Dr. DuVal, the minister of that church, recently retired.

E. T. STOTESBURY, of J. P. Morgan & Co., New York, has been elected President of the Reading Company, the holding corporation for the Philadelphia & Reading Ry. and Philadelphia & Reading Coal & Iron Co. Theodore Voorhees, Vice President of the railway company, has been elected President, succeeding G. F. Baer, deceased.

W. J. P. McGREGOR, Division Freight Agent, G. T. Pacific Ry., Edmonton, Alta., was presented with a signet ring and silk umbrella, by the local G. T. R. staff and city club, Moncton, N. B., recently, on his leaving for the west, after having occupied the position of Commercial Agent, G. T. R. for some time.

S. R. JOYCE, whose appointment as Travelling Passenger Agent, G. T. R., Toronto, was announced in our last issue, was born at Napanee, Ont., Dec. 15, 1887, and entered G. T. R. service, Mar. 7, 1905, since when he has been, to Oct. 31, 1912, ticket clerk, Kingston, Ont.; Nov. 1, 1912 to Mar. 1, 1914, ticket clerk, city ticket office, Toronto.

J. A. RICHARDSON, District Passenger Agent, Wabash Rd., Toronto, while doing some work on the verandah of his home, May 14, fell from a ladder, his collar bone being broken and his head seriously injured necessitating an operation at the Toronto General Hospital. On May 28 he was reported to be progressing satisfactorily, and was expected to resume his duties shortly.

J. R. WILSON, who died in London, Eng., May 11, after a short illness, was connected with numerous interests, more or less intimately associated with transportation interests; among them being, Dominion Coal Co., as Vice President; Canadian Steel Foundries, Ltd., as director; Dominion Steel Corporation, as director, and Montreal Locomotive Works, Ltd., as director.

NORMAN B. JONES, who has been appointed Car Foreman, C.P.R., Kenora, Ont., was born at St. John, N.B., Nov. 9, 1869, and entered C.P.R. service Aug. 17, 1901, since when he has been, to Oct. 1, 1909, car carpenter, Kenora; Oct. 1, 1909, to Nov. 1, 1910, wrecking foreman, Kenora; Nov. 1, 1910, to Apr. 24, 1914, Assistant Car Foreman, Kenora.

C. E. MASON, who was recently appointed Travelling Passenger Agent, White Star-Dominion Line, Montreal, was presented with a travelling bag and signet ring, by the local staff of the G. T. R. and allied concerns at Montreal, May 2, on his leaving G. T. R. service, where he had been for 18 years, latterly as chief clerk to the District Passenger Agent.

ROBERT STANLEY EDWARDS, whose appointment as Soliciting Freight Agent, Northern Pacific Ry., Montreal, was announced in our last issue, was born at Montreal, June 2, 1890, and prior to Mar. 15, the date of his appointment, had been, for a number of years, shipper for several of the manufacturing and wholesale trades of Montreal.

STEPHEN T. STACKPOLE, who was recently appointed Canadian Freight Agent, Pennsylvania Rd., Toronto, was born at Hamilton, N. Y., Oct. 14, 1885, and entered P. Rd. service, Dec. 1907, since when he has been, to Sept. 1910, clerk at Baltimore, Md., and Philadelphia, Pa.; Sept. 1910, to Mar., 1914, Soliciting Freight Agent, at York, Pa.,

Baltimore, Md., New Haven, Conn., Easton, Pa., and Uniontown, Pa., consecutively.

D. H. MAPES, who has been appointed Superintendent of Building Construction, Eastern Lines, Canadian Pacific Ry., Montreal, has been connected with engineering and building construction for the past 22 years, chiefly in the U. S., where he was for several years, Vice President of J. V. Schafer and Co., New York. He entered C. P. R. service as assistant to the Superintendent of Building Construction, in July, 1912.

J. W. BARNETT, whose appointment as Tariff Inspector and Assistant Weighing Inspector, Intercolonial Ry., Moncton, N. B., was announced in our last issue, was born at Hillsboro, N.B., Jan. 5, 1885, and entered I. R. C. service, Dec. 27, 1901, since when he has been, to Oct. 1, 1903, clerk, Freight Claim Agent's office; Oct. 1, 1903, to Aug. 1, 1908, clerk and stenographer, General Freight Agent's office; Aug. 1, 1908 to Feb. 1, 1914, secretary to General Traffic Manager.

CHARLES STIFF, who died at Hamilton, Ont., recently, aged 73, was, at one time, accountant on the Great Western Ry., Hamilton, and on the absorption of that line by the G.T.R. in 1882, was appointed Superintendent there. He resigned in 1887, when he was offered the position of General Passenger Agent, as it would have necessitated his removal from Hamilton, and went into private practice as auditor and accountant.

H. E. WHITTENBERGER, General Superintendent, Ontario Lines, G.T.R., Toronto, was recently presented with a jewelled monogram scarf pin, by the Governor General, as an acknowledgment of attentions during his recent trip through Western Ontario. Towards the end of May he was taken to Wellesley Hospital, Toronto, where he underwent an operation for gall stones. The operation was successful, and on May 26 he was reported to be progressing satisfactorily.

Hon. WILLIAM GIBSON, who died at Beamsville, Ont., May 4, was born at Peterhead, Scotland, Aug. 7, 1849, and came to Canada in 1870. During his business career as a contractor, he carried out a number of large railway contracts, including the masonry work on both sides of the river, for the St. Clair tunnel at Sarnia, Ont., the masonry work for the enlargement of the Victoria Jubilee bridge at Montreal, etc. He was elected an associate of the Canadian Society of Civil Engineers in 1891.

F. RIDDINGTON, who died at St. Andrews East, Que., May 12, entered railway service with the Great Western Ry., at Brantford, Ont., in 1874, and shortly afterwards was moved to Toronto, where he was foreman, and later freight claims clerk. He was then transferred to Montreal as chief clerk in the freight claims department, where he remained until his retirement under the pension rules a few years ago. His son, Alfred, is in the G.T.R. Vice President's office at Montreal, and another son, Frederick, is in G.T. Pacific Ry. service at Fort William, Ont.

GEORGE W. LEE, whose appointment as Commissioner, Timiskaming and Northern Ontario Ry., North Bay, Ont., was announced in our last issue, was born at Renfrew, Ont., Apr. 15, 1871, and entered railway service, Nov. 1, 1898, since when he has been, to June 1, 1900, freight clerk, C.P.R., Renfrew, Ont.; June 1, 1900, to Jan. 1, 1901, in tie and timber business, C.P.R., North Bay, Ont.; Jan. 1, 1901, to Sept. 1, 1905, in charge of freight sheds, C.P.R., North Bay, Ont.; Sept. 1, 1905, to Apr. 16, 1914, General Agent, Timiskaming and Northern Ontario Ry., North Bay, Ont.

Prof. A. K. KIRKPATRICK, M. Can. Soc. C.E., Professor of Civil Engineering at the School of Mining, Queen's University, Kingston, Ont., died in New Brunswick, May 19, following an operation for appendicitis. He was born at Kingston, Ont., and graduated from the Royal Military College in 1880, being one of the first class of graduates. He was engaged for some years on railway work in Egypt, and was subsequently City Engineer at Kingston. In 1906 he was appointed Professor of Civil Engineering at Queen's University. He has, at different times been engaged in marine and terminal work for the Dominion Government, latterly in connection with the tests of general conditions of ice, tides, currents, etc., between the main land and Prince Edward Island, in preparation for the car ferry service there.

A. M. NANTON, who has been elected a director of the C.P.R. to fill the vacancy caused by the death of Sir William Whyte, was born at Toronto, May 7, 1860. After being for some years in Osler and Hammond's office in Toronto, he entered the firm of Osler, Hammond and Nanton, brokers, etc., Winnipeg, on its establishment in 1884, and has since been closely identified with the development of the prairie provinces, and is a recognized leader in commercial life in the west. He was President, Winnipeg Board of Trade, in 1898, and is President, Winnipeg Stock Exchange, and Manitoba Cartage Co., a director of Winnipeg Electric Ry., Dominion Bank, Great West Life Assurance Co., and Toronto General Trusts Co. He was Managing Director of the Alberta Ry. and Irrigation Co., which is now controlled by the C.P.R., and was from 1894 to 1898, Receiver, Manitoba and North Western Ry., representing the English bond holders. He is also prominently identified with several financial and industrial concerns.

NORMAN W. VAN WYCK, who has been appointed Freight Claims Agent, Canada Steamship Lines, Ltd., Montreal, was born at Hamilton, Ont., June 29, 1883, and entered transportation service, Apr. 1, 1899, since when he has been, to Dec. 1899, shed foreman's clerk, C. P. R. and Toronto, Hamilton and Buffalo Ry., Hamilton, Ont.; Jan. 1 to Mar. 1900, record clerk, same companies, Hamilton, Ont.; Apr. to July 1900, assistant biller, same companies, Hamilton; Aug. 1900 to Sept. 1902, inward clerk, C. P. R., Hamilton; Oct. 1902 to Nov. 1903, inward clerk, T. H. & B. R., Hamilton; Dec. 1903 to Feb. 1906, claims clerk, C. P. R. and T. H. & B. R., Hamilton; Mar. to Sept. 1906, assistant accountant, same companies, Hamilton; Oct. 1906 to Aug. 1908, cashier, C. P. R., Hamilton; Sept. 1908, to Feb. 1910, cashier, T. H. & B. R., Hamilton; Feb. to Apr. 14, 1910, general accountant, C. P. R. and T. H. & B. R., Hamilton; Apr. 15, 1910 to June 1913, chief clerk, Freight Traffic Manager, Inland Lines, Ltd., Hamilton; Feb. 1913 to Apr. 30, 1914, chief clerk, Freight Traffic Manager, Richelieu and Ontario Navigation Co., Toronto.

CHARLES W. STACKHOUSE, who was recently appointed Locomotive Foreman, C. P. R., Sortin Yard, Montreal, was born at St. John, N. B., May 11, 1881, and entered railway service in March 1900, since when he has been, to May 1904, machinist apprentice, Intercolonial Ry., Moncton, N. B.; May 1904 to Feb. 1905, machinist, Angus Shops, C. P. R., Montreal; Feb. to Sept. 1905, machinist, Intercolonial Ry., Moncton, N. B.; Sept. 1905 to May 1906, student in mechanical engineering, McGill University; May to Sept. 1906, machinist, Intercolonial Ry., Moncton, N. B.; Sept. 1906 to May 1907, student, McGill University; May 1907 to Sept. 1908, draughtsman, Montreal Locomotive Works; Sept. 1908 to May 1909, student, McGill University; May to Oct 1909, laying out boilers, Montreal Locomotive Works; Oct. 1909 to May 1910, student, McGill University; May 1910 to Feb. 1911, Locomotive Inspector, Eastern Lines, C. P. R., Montreal; Feb. to June 1911, Assistant Foreman, C. P. R., Outremont, Que.; June to Oct. 1911, relieving Foreman, Eastern Division, C. P. R.; Oct. 1911 to June 1912, Locomotive Foreman, C. P. R., Three Rivers, Que.; June 1912 to June 1913, Locomotive Foreman, C. P. R., Sherbrooke, Que.

J. C. BECKWITH, whose appointment as Engineer of Construction, Canadian Government Railways, Moncton, N. B., was announced in our last issue, was born at Fredericton, N. B., Aug. 1, 1875, and entered railway service, June 1898, since when he has been, to 1900, rodman and draughtsman, Columbia and Western Ry., Boundary District, B. C.; 1900, draughtsman, C. P. R. in British Columbia and Ontario; 1901, draughtsman, Algoma Central and Hudson Bay Ry. in western Ontario; 1901 to 1902, draughtsman, C. P. R., Winnipeg; 1902 to 1903, leveller and transit man, C. P. R., Winnipeg; 1903, Resident Engineer, C. P. R., Winnipeg; 1903 to 1904, transit man and Resident Engineer, C. P. R., Winnipeg; 1905 to 1907, Assistant Engineer, Construction Department, Eastern Lines, C. P. R., Montreal; 1907 to 1908, Engineer in Charge, New Brunswick Southern Ry., St. John, N. B.; 1909, Division Engineer, New Canadian Co., Port Davis, Que.; 1909 to 1912, Assistant Engineer, Construction Department, Western Lines, C. P. R., Winnipeg; 1912 to 1913, Assistant Engineer, Construction Department, Eastern Lines, C. P. R., Montreal; 1913 to Apr. 1, 1914, Assistant Engineer, Canadian Government Railways, Moncton, N. B.

Consolidation of the Railway Act.—The bill for the consolidation and amendment of the Railway Act was introduced into the Senate recently, and was referred to a committee to sit concurrently with a similar committee to be appointed by the House of Commons. This latter committee was appointed April 29. Senator Young is chairman of the Senate section of the committee, and J. E. Armstrong, M. P., chairman of the House of Commons section. The committee has been sitting Tuesdays and Thursdays to hear evidence from any persons who may wish to present their views for or against any part of the bill; and at other times as may be expedient. It was stated May 12, that it was expected that the work of the committee would be completed to enable the bill to be discussed at the current session of Parliament.

Block Signal System on the Intercolonial Ry.—The acting Minister of Railways informed the House of Commons, May 6, that a block signal is being installed on the Intercolonial Ry. between Halifax and Windsor Jct., N. S., by the Union Switch and Signal Co., which also has a contract for installing the block signal system between St. John and Hampton, N.B., and Moncton and Painsec Jct., N.B. The total amount involved in the contract is $85,000.

Pacific Great Eastern Ry.—In connection with the recent issue of £1,500,000, Brown, Shipley and Co., London, Eng., announce that they are prepared to accept fully paid scrip for registration. The coupon of £2 5s., due July 15, must be left attached. Warrants for the half year's interest, due July 15, will be mailed to stock holders by June 26.

J. W. Barnett, Traffic Inspector and Assistant Inspector, Canadian Government Railways, Moncton, N. B., writes, "I always read Canadian Railway and Marine World and find the contents most interesting."

Canadian Northern Railway Construction, Betterments, Etc.

Nova Scotia.—A press dispatch from Sydney, N.S., May 14, stated that H. J. McKenzie, with a staff of Canadian Northern Ry. engineers, was making surveys in Cape Breton, with a view of connecting the Inverness Ry. and Coal Co.'s line in Inverness county, with Sydney and Louisburg, and through the Bras d'Or country with the Cape Breton Ry. at St. Peters.

Canadian Northern Quebec Ry.—We are officially advised that nothing has been definitely decided as to building a cooling plant at Quebec.

A press report states that a portion of the terminal property south of the Hay Market, Montreal, is to be immediately developed, by the erection of a substation for freight to and from the west end, that the building will be 100 ft. square, and that the distribution will be by motor trucks.

Mount Royal Tunnel and Terminal Co.—Excavation for the C.N.R. station in Montreal is reported to be in progress, and work is also reported to be under way at the site for the Mount Royal Heights station and at the site for the electrical substation in the Model City. The work on the tunnel itself is progressing rapidly, and the tunnel is now well advanced to its full dimensions, 30 ft. wide by 22 ft. high. The lining will be of concrete, but near the Dorchester St. end a steel roof is to be provided. The lining is expected to be completed in the autumn, and the entire tunnel, with its equipment, to be ready for operation in about a year.

Montreal-Ottawa-Port Arthur Line.—The bridge construction on the line from Montreal to Hawkesbury is reported completed, with the exception of those across the River des Prairies and the Mille Isle River. The substructures for both high bridges are ready for the steel work, and the erection of this is expected to be finished by July 31. The line is in operation from Hawkesbury to Ottawa, and from Ottawa to Pembroke the grading and bridge work is well advanced. Three spans of the 1,800 ft. bridge across the Ottawa River at Portage du Fort have been erected, and preparations are going on for the erection of the 1,600 ft. bridge across the same river at Fitzroy harbor. It is expected to have this stretch of 170 miles completed this year. The Pembroke-Capreol section is also expected to be completed this year. The line is in operation from Capreol to Ruel, and a service is also being given from Ruel to Port Arthur. The finishing up operations on this latter section are in progress, ballasting and other gangs having been at work since early in April. The whole line is expected to be put in operation in the autumn.

Canadian Northern Ontario Ry.—The first through train from Quebec, run entirely over the C.N.R. lines, arrived in Toronto, May 1, and was sent on to the west, over the company's Toronto-Sudbury line. By this route the company is enabled to give connections from Quebec through to west of Edmonton, Alta.

In connection with the opening for through traffic of the Toronto-Ottawa line, a passenger service, mainly for tourist purposes, is to be operated by a gasoline electric car, from Ottawa to Chaffey's Locks, 79 miles.

With regard to the lines to be built under some one or other of the charters controlled by the C.N.R. interests, press reports state that arrangements will be completed for starting operations if Parliament decides to give the aid by way of guarantees asked by the company. The following statement is said to have been made:—"Work will be started at Toronto and at both the east and west sides of Hamilton, also in the centre of the city at St. Catharines, Niagara Falls and Buffalo simultaneously. The ground has been thoroughly surveyed, and is said to offer no serious obstacles to a line between the Falls and Toronto. The city of St. Catharines is going to give material financial aid for the new high level bridge that will cross the canal valley. West of Hamilton the line will divide near the Junction cut. The west line will run between the present city limits and the McKittrick survey, and will parallel the T. H. & B. line to Brantford. Beyond that there is some uncertainty about it. It is said that negotiations are now being carried on for the purchase of the old Pere Marquette local line from London to Windsor, but that this line will only be purchased in the event of the company being unable to buy links of various local lines giving a more direct route to the border."

Canadian Northern Ry.—Plans are reported to have been prepared for the erection of a station, 143 by 24 ft., at Port Arthur, Ont., and for the building of a modern coal plant at Fort Frances, Ont.

It is reported from Winnipeg that work is to be started at once under the charter of the Winnipeg River Ry., on a line from Lac du Bonnet, and Little Bonnet Falls.

A press report states it is expected that the new bridge across the Assiniboine River, at the junction with the Red River at Winnipeg, will be opened for traffic early in June. The bridge is to be used for freight traffic only.

The agreement for the use by the G.T. Pacific Ry. of the terminals at Fort Garry is being confirmed by the Dominion Parliament. A summary of the agreement is given on another page, under the heading of Grand Trunk Pacific Ry. Construction.

The Attorney-General of Manitoba is reported to have said at Neepawa recently that the Government is ready to guarantee the company's bonds for the building of a line northerly from McCreary or Laurier northerly to connect with the Gypsumville extension.

We are officially advised in respect to the extension of the line to Grand Marias and Victoria Beach that grading has been completed from the present track end of the Birds Hill line for 50 miles to Grand Marias, and that tracklaying on the same is now in progress. It is intended to extend this line for a further distance of 14 miles to Victoria Beach. This will provide convenient access for the people of Winnipeg to the various summer resorts along the eastern shore of Lake Winnipeg.

A press report states that grading is to be started this year on the first 25 miles of the line from Melfort, Sask., to Pas, Man. John Mackenzie, of the company's engineering staff at Winnipeg, was at Melfort recently, and representatives of several contracting firms havo since been over the route.

The operating department has taken over the extension of the line from Avonlea to Gravelburg, 78.5 miles, and put on a train service. It is expected that this branch will ultimately be extended to Swift Current, Sask.

A press report states that surveys have been completed for a branch line from east of Radville, on the Maryfield branch, into Weyburn, Sask., and that some grading may be done this year.

The Board of Railway Commissioners has approved location plans for the extension of the Swift Current line from mileage 124.96 to 142.53.

Press reports from Edmonton, Alta., state it is expected that about $10,000,000 will be expended by the C.N. Ry. upon construction in Alberta during this year. This includes the $6,500,000 realized on the recent sale in England of the bonds, guaranteed by the Province, of the Canadian Northern Western Ry. The following statement has been issued by the Provincial Department of Railways, showing the lines aided by the Province and the mileage constructed:—

Edmonton by way of Strathcona, Camrose and Calgary to Lethbridge—Guaranteed for 335 miles at $15,000 a mile, 253 miles completed. Camrose to Vegreville—Guaranteed for 45 miles at $15,000 a mile, completed. From crossing of Edmonton-Lethbridge line and Little Bow River, south to Macleod—Guaranteed for 110 miles at $15,000 a mile, will in all probability be built this year. From near Macleod to western boundary—Guaranteed for 65 miles at $15,000 a mile, 30 miles of grade completed. Morinville to Athabasca—Guaranteed for 72.3 miles at $15,000 a mile, completed. From Mile 175 of the Goose Lake line to Munson—Guaranteed for 127.5 miles at $15,000 a mile, completed. From Little Bow, south of Calgary to Macleod—Guaranteed at $15,000 a mile, the Government insists on this being built this year.

The lines authorized to be built under guarantee by the Canadian Northern Western Ry., with the work done to date, are:—

Onoway northwest to Pine River Pass—Guaranteed for 100 miles at $20,000 a mile. This is generally supposed to be the main line of the C.N.R. to the Peace River country. Pine River Pass is northwest of Grand Prairie City. Grading has been completed to Whitecourt, 32 miles of steel have been laid, and the rest will be laid this year.

Oliver northeast to St. Paul de Metis—Guaranteed for 100 miles at $13,000 a mile. The whole of the right of way has been cut and 14.5 miles of grade completed. No steel has been laid.

Bruderheim, by way of Vermilion, Wainwright and Medicine Hat, to the international boundary, with branch northwest of Vermilion to eastern boundary. Guaranteed for 30 miles at $13,000 a mile. The building of this road has hitherto been held up on account of the failure to locate a feasible route. The right of way has been partly cleared, and a few miles of grade completed.

Calgary northeast to Brazeau Line—Guaranteed for 100 miles at $13,000 a mile. This road leaves the Edmonton-Calgary line near Calgary and runs due north to the Brazeau line. Some construction has been done north of Red Deer. The company is stated to be anxious to build this line.

Camrose to Alsask—Guaranteed for 80 miles at $13,000 a mile. This road runs form Camrose to meet the Saskatoon-Calgary line at Alsask, 30 miles of grade completed. Some litigation over the Battle River crossing has delayed operations, but suitable arrangements, it is stated, have now been made, and the work will likely go ahead.

Edmonton, by way of Cochrane, to Pincher Creek—Guaranteed for 200 miles at $15,000 a mile. Some grading done.

Blackfalds to Goose Lake—Guaranteed for 118.5 miles at $13,000 a mile. This runs to Warden, which is south of Stettler, on the Strathcona-Calgary line, and then southeast to Hanna, a divisional point on the Saskatoon-Calgary line, 61 miles completed to Warden. Plans have been filed from Warden to Hanna, but no work has been done on this stretch.

It is reported that the line from Edmonton to Tollerton, 137 miles, is to be reballasted this year, and a train service placed in operation.

Plans for the route of the Peace River line, the grading of which has reached White Court, near the confluence of the Macleod and Athabasca Rivers, have been filed, and show a route following the Athabasca River valley for about 50 miles, then crossing to the Macleod River valley, and on to the Smoky River valley, crossing the latter river about three miles from the mouth of the Wapiti River.

We are officially advised that some clearing and grading has been done on the branch line from Oliver towards St. Paul de Metis, Alta. What additional work may be done this year has not been decided.

Canadian Northern Pacific Ry.—S. H. Sykes recently completed a trip of inspection over the line, and is reported to have stated that 60% of the grading had been completed on the 20 mile section west of Albreda Summit, the last piece of grading to be undertaken. Track laying is reported to have been started May 1 from the end of steel 110 miles west of Yellowhead Pass. The bridge construction along the line was well forward. Track is laid to mileage 122 north of Kamloops, and it is expected that the track laying gangs would meet some time in August.

The Premier of British Columbia, and a party of officials made a trip of inspection over the line recently from Port Mann to Cisco bridge, at mileage 140.

M. H. MacLeod, Chief Engineer and General Manager, is reported to have stated that construction on the branch from Kamloops to Okanagan will be started during the summer.

The reclamation work at the False Creek flats, Vancouver, is being rapidly proceeded with. The material raised from the area being dredged by the Dominion Government is being deposited on the portion of the flats being developed by the C.N.P.R. The dredging company has agreed to supply 3,750,000 cubic yards of material, and this is being carried by a pipeline about 4,000 feet long.

Vancouver Island.—It is expected that the branch line from Victoria along the Saanich Peninsula will be ready for track laying early in July. The British Columbia Government has issued the following statement as to work on the Island lines to April 30:—GRADING.—Location, Patricia Bay, total mileage, 15¼; 11 miles completed; date of completion, Aug. 1, 1914. Location, Victoria to mile 50, total mileage 50; 45 miles completed; date of completion, Aug. 1, 1914. Location, mile 50 to 100, total mileage, 50, 45 miles completed; date of completion, July 1, 1914. Location, mile 100 to 142, total mileage, 42, 25 miles completed; date of completion, Jan. 31, 1915. BRIDGING.—Patricia Bay branch, 35% completed, date of completion, Aug. 1, 1914. Victoria to mile 50, 97% completed, date of completion, Aug. 1, 1914. Mile 50 to 100, 60% completed, date of completion, July 15, 1914. Mile 100 to 142, nothing done; date of completion, Jan. 31, 1915. There are several steel structures which cannot be erected until the track reaches the bridge site, one of which, the crossing of the Koksilah River, will be a large structure. (April, pg. 170.)

The Canadian Locomotive Co., has delivered 4 mogul locomotives to J. D. McArthur and Co., Winnipeg; 1 six wheeled locomotive to Robt. McNair Shingle Co., Vancouver, B. C.; 3 consolidation locomotives to Intercolonial Ry., and one six-wheeled locomotive to Baldry, Yerburgh and Hutchison, St. Catharines, Ont.

Railway Rolling Stock Notes.

The Intercolonial Ry. has ordered 6 consolidation and 4 switching locomotives from Canadian Allis-Chalmers, Ltd.

The Canadian Northern Ry. has received three consolidation locomotives from Canadian Allis-Chalmers, Ltd.

F. H. Hopkins and Co. have ordered 2 Lidgerwood rapid unloaders, 50,000 lbs. capacity, from Canadian Car and Foundry Co.

J. D. McArthur Co., railway contractors, have ordered 50 all wood flat cars, 50 tons capacity, from Canadian Car and Foundry Co.

The private car Ceres, owned by the Massey-Harris Co., Toronto, has been rebuilt recently by the Preston Car and Coach Co.

The Mond Nickel Co. has ordered 12 all steel Otis ore cars, 50 tons capacity, from Hart-Otis Car Co. These will be built by Canadian Car and Foundry Co.

The Intercolonial Ry. has received 2 consolidation locomotives from Canadian Locomotive Co.; and 96 steel frame box cars and 8 cabooses from Nova Scotia Car Works.

The C. P. R., between Apr. 15 and May 15, ordered the following rolling stock, from its Angus Shops,—69 steel frame box cars, 4 flat cars, 4 stock cars, 10 freight refrigerator cars and 4 vans.

We are advised that there is no official knowledge of the Montreal Harbor Commissioners having placed a large order for railway equipment, as recently mentioned in the daily press, or of their being about to place one.

The C. P. R., between Apr. 15 and May 15, received the following additions to rolling stock,—185 steel frame box cars, 3 steel colonist cars and 1 class G2 locomotive, from its Angus Shops, and 70 steel frame box cars from Canadian Car and Foundry Co.

The G.T.R. has received 150 stock cars from the National Steel Car Co.; 3 steel mail cars from the American Car and Foundry Co.; 5 express cars and 7 baggage cars from the Osgood Bradley Car Co., and 349 flat cars from the Western Steel Car and Foundry Co.

The Canadian Car and Foundry Co., during April, delivered the following rolling stock,—1 seventy-five ton truck to Dominion Bridge Co.; 42 steel frame box cars, 40 tons capacity, and 52 wood ballast cars, 40 tons capacity, to C.P.R.; 20 steel frame box cars, 30 tons capacity, to Intercolonial Ry., and 20 steel underframe street cars, to Montreal Tramways Co.

The Intercolonial Ry. has ordered 180 steel underframe box cars, 40 tons capacity, from Eastern Car Co. Following are the chief dimensions,—

Length over running board	38 ft. 5½ ins.
Length over buffer blocks	38 ft. 1¼ ins.
Length inside end sills	36 ft. 11½ ins.
Length inside car	36 ft.
Width inside car	8 ft. 6½ ins.
Width over side sills	8 ft. 9½ ins.
Width over side posts	9 ft. 3½ ins.
Centre to centre of trucks	26 ft. 10 ins.
Height from rail to top of running board	13 ft. 4¾ ins.
Width of door opening	5 ft.
Height of door opening	7 ft. 8 7-16 ins.

The Pacific Great Eastern Ry. has ordered two consolidation locomotives from Canadian Locomotive Co., making four now on order. Following are the chief details,—

Weight on drivers	156,000 lbs.
Weight in working order	176,000 lbs.
Wheel base, rigid	16 ft.
Wheel base, total	24 ft.
Wheel base, engine and tender	60 ft.
Heating surface, firebox	188 sq. ft.
Heating surface, tubes	2,500 sq. ft.
Heating surface, total	2,688 sq. ft.
Driving wheels, diar.	57 ins.
Driving wheel centres	Cast steel
Driving journals, diar. and length	9 by 12 ins.
Cylinders, diar. and stroke	21 by 28 ins.
Boiler, type	Extended wagon top, radial stay
Boiler pressure	180 lbs.
Tubes, no. and diar.	158—2 ins.; 22-5-⅜ ins.
Tubes, length	14 ft.
Injectors	Ohio
Safety valves	Star
Brakes	Westinghouse American
Superheater	Locomotive Superheater Co., Schmidt A
Weight of tender, loaded	144,000 lbs.
Truck	Equalizer type
Truck wheel diar.	33 ins.
Truck wheel type	Steel tired
Journals, diar. and length	5½ by 10 ins.
Brake beams	M.C.B. 2
Tank capacity	6,000 imp. galls.

Railway Finance, Meetings, Etc.

Central Vermont Ry.—An act was passed, May 6, by the Rhode Island Legislature authorizing the leasing of the Southern New England Ry to the C. V. R. Co. The S. N. E. Ry. has charters for the building of lines from points on the C. V. R. to Providence, R. I., and to Boston, Mass., and its construction is being financed by the G. T. R., which controls the C. V. R. The act passed recently authorizes the leasing of the undertaking in Rhode Island to the C. V. R.

Kettle Valley Ry.—A meeting of shareholders was held in Toronto, May 25, to pass a resolution cancelling the mortgage dated June 2, 1913, in favor of the Royal Trust Co.; to authorize the issue of bonds to provide funds for the building of the line in lieu of the bonds already authorized, and to enter into a new mortgage to secure the new issue of bonds. G. B. Gordon is Secretary.

Ontario and Quebec Ry.—The half yearly interest on the several stocks will be paid to the holders of stock as of May 1, on and after June 2 as follows: debenture stock, 5%; common stock, 6%.

Pacific Great Eastern Ry.—The Minister of Railways for British Columbia has given consent to the sale of an issue of £1,500,000 of the company's stock at 95.

Temiscouata Ry.—Net earnings for January, $4,026, against $4,851.80 for Jan., 1913. Aggregate net earnings for seven months ended Jan. 31, $24,615, against $34,562 for same period 1912-13.

Reading Lines.—The various duties of the late G. F. BAER, President of the companies embraced in the Reading System, have been divided. E. T. STOTESBURY has been elected President of the Reading Co., and Chairman of the Board, Philadelphia and Reading Ry. W. G. BESLER, heretofore Vice President and General Manager, Central Rd. of New Jersey, has been appointed President, C. R. of N. J.; and THEODORE VOORHEES, heretofore Vice President, Philadelphia and Reading Ry., has been appointed President, P. & R. Ry.

Canadian Pacific Railroad Trust Co.—A press dispatch from London, Eng., May 7, stated that the C.P.R. has no connection with the Canadian Pacific Railroad Trust Co., which has issued a prospectus inviting subscriptions for £1,200,000 shares. It is also stated that G. McL. Brown, European Manager, C.P.R., contemplates taking legal action against the promoters of the organization.

Fires near Right of Way.—The Board of Railway Commissioners has notified railway companies to submit monthly, in duplicate, reports according to a form prescribed, on fires originating within 300 ft. of the track and burning over an area of 100 sq. ft. or more outside the right of way. The submission of such reports is limited to lines or portions of lines to be broadly classified as running through forest sections.

National Transcontinental Railway Construction.

The acting Minister of Railways in presenting the annual report of the department to the House of Commons recently said ,the total expenditure from the inception of construction between Moncton, N. B., and Winnipeg, up to Dec. 31, 1913, was $140,562,147. Of that amount $10,314,904.05 was expended during the first nine months of the current financial year. It is estimated it will cost $20,745,653 to complete the line, so that the total cost will be $161,307,800. A statement was prepared showing the capital cost of the line by the time the Grand Trunk Pacific Ry. is obliged to commence to pay interest. This shows a capital cost to Jan. 1, 1923, and includes interest during construction to Jan. 1, 1915, and the interest for seven years thereafter capitalized, and makes up a total of $223,514,092.28. The rental at 3% on this would be $6,705,422.79. If the line did not earn 3% in excess of working expenses then the interest would be added to capital for a further period of three years. No allowance was made in the statement for betterments, but should any have been made their cost would have to be added to the total cost for rental purposes. The line is costing the country interest at the rate of 3½%, but under the agreement, only 3% can be capitalized, and only 3% can be claimed as rental. This means that on the expenditure to Dec. 31, 1914, there has been a clear cost to the country of $3,893,230.33, and it is estimated that during the 50 years of the lease the loss will amount to $908,687 a year, or a total of $45,433,900.

As to the condition of the railway. The rails have all been laid and about 460.4 miles has been taken over from the contractors. The remaining 1,344 miles are nearing completion. It requires some ballasting, the placing in position of a number of steel bridges, the building of some station houses and other works, but it is expected that all these will be completed and the line ready for operation in its entirety during this year.

The amount expended on the Quebec Bridge, which was not originally part of the N. T. Ry., to Jan. 1, was $4,889,000 and it is estimated that the total cost of the bridge when completed will be about $17,000,000. There is also $6,456,546.44 which was expended on the bridge which collapsed, and which is a total loss. The contract for the substructure was awarded to M. P. and J. T. Davis, Jan. 10, 1910. The contractors practically completed the work last autumn. Some little work, such as painting, cleaning the stones, and clearing up the site, remains to be done, and will be completed during this year. The contract for the superstructure of the bridge was awarded to the St. Lawrence Bridge Co., April 4, 1911. Shops for the manufacture of the bridge were completed, and a start was made in Jan., 1913, on fabrication. During 1913 the shops made good progress on the preparation of final plans and have fabricated and shipped to the site some 9,000 tons of bridge material. They have erected a large part of their plant at the bridge site, and have also erected approach spans on the north shore of the river, thus making a start on the erection of the bridge proper. It is expected that during this year the company will fabricate and erect the major portion of the north anchor arm. The weight of this portion is estimated at 15,930 tons, and it is estimated that its cost when erected will be $2,870,000. The information the department has from the supervising board is to the effect that the bridge will be completed by the end of 1917.

Until the completion of the Quebec Bridge the connection between the two sections of the line will be maintained by a car ferry. The piers for the operation of the ferry are under construction, and will be completed during this year. The ferry steamer is expected to be delivered at Quebec about the middle of the summer.

Tenders are being received to June 2, for the erection of a station with covered platform on the Champlain market site, Quebec. The question of the erection of a Union station at the Palais, Quebec, is reported to have been practically settled, and it is said that tenders for its erection will shortly be invited. The plans for the station have been deposited in the Quebec registry office. They are practically the same as those drafted and accepted in 1913, one exception being the changes decided in regard to the right of way along Prince Edward St.

In connection with the erection of mechanical coaling plants at Monk, Bridge, Fitzpatrick, Doucet, and O'Brien, the acting Minister of Railways informed the House of Commons, recently, that the contract was let to Roberts and Schaefer Co., Chicago, Ill., for $107,931. The contract calls for a plant of an elevating capacity of 2½ tons. The price for piles delivered and driven is $2.50 a lineal foot. One of the plants is in course of erection at O'Brien, the first divisional point east of Cochrane, Ont., on which the following subcontracts have been let:—Structural steel work to Dominion Bridge Co.; electrical work to Canadian General Electric Co.

The Dominion Parliament has voted $1,333,333.34 on account of the construction of the line, and $500,000 on account of the construction of the Quebec Bridge. (April, pg. 172.)

Grand Trunk Pacific Railway Construction.

A press report states that a contract has been let to the Great Lakes Dredging Co., for driving piles for the foundation of a coal dok on G.T.P. Ry. property at Fort William, Ont., at the mouth of Mission River. It is stated that the dock and plant will have a capacity of over 200,000 tons.

The Dominion Parliament has under consideration a bill confirming an agreement between the G.T.P. Ry. and the Canadian Northern Ry., dated April 10, 1913, for the use by the former of the latter's terminals in Winnipeg, the Crown being a party to the agreement as a guarantor of G.T.P. Ry. bonds. Section 2 of the bill confirms the use of the property mentioned in the agreement to the G.T.P. Ry. notwithstanding any default made by the C.N. Ry. in meeting any mortgages or charges at present existing or hereafter to be made. The agreement which is attached as a schedule, describes the property to be utilized for joint terminal purposes, and defines the rights of each thereto, and as to the use of any other tracks hereafter to be laid by either of them. The joint section is to be maintained and operated under the terms and provisions of the agreement dated Nov. 1, 1907, so far as applicable. The value of the property included in the joint section under the agreement is placed at $1,200,000, and the G.T.P. Ry. is to pay a rental of 5% a year upon one-half of that amount, and 5% a year on any future capital expenditures, and on certain other specified expenditures. The business of the Great Northern Ry., the Northern Pacific Ry., and their allied company the Midland Ry., is to be handled as C.N. Ry. business for two years, pending the completion of their own freight terminals. The agreement came in force July 1, 1913, and is to continue for 999 years.

Morley Donaldson, Vice President and General Manager, is reported to have stated after his return to Winnipeg, from an inspection trip over the line, that a regular train service would be put in operation from Edmonton to Fort George on July 1, to replace the present partial and temporary service, and that it was hoped to be able to run traffic through to Prince Rupert by September. There are about 300 miles of track on which ballasting has to be completed, and a lot of finishing up work to be done. The telegraph line has been completed, and the bridge work is expected to be completed by June 30. Locomotive sheds are being built at Fort George and Endaco, B.C., and the other buildings west of Fort George are being erected.

Work is reported to have been stopped on the branch from Harte to Brandon, Man. Grading is said to have been completed to within a mile of Brandon, and the substructure for the bridge across the Assiniboine River erected. Two matters are delaying the completion of the branch, viz:—the high prices asked for the right of way, and the insistence of the Brandon City Council that a Union station be built with the Canadian Northern Ry.

Press reports state that work will be started on an early date on the 15 mile branch line from Talmage, on the Regina-Boundary branch, into Weyburn, Sask.

A train service will be put in operation on the line from Regina to Mawer, Sask., June 1.

The Board of Railway Commissioners has approved revised location plans for the Moose Jaw Northwest branch, mileage 73.34 to 77.99, authorized the opening for traffic of the Young-Prince Albert branch from mileage 67 to 87; approved of the revised location plans for the Battleford branch, through northwest ¼ sec. 4-43-16 west of the third meridian.

The Northwest Mounted Police finally vacated the barracks in Calgary, May 5, and the G.T.P. Ry. entered into possession. The clearing of the site for station and other terminal purposes has been started. The first building to be erected will be a freight shed 500 by 40 ft. at the corner of Ninth Ave. and Sixth St. E. It is expected that work will be started on the passenger station in the autumn.

A regular train service will be put in operation on the Tofield-Calgary branch, June 4, replacing the present temporary services. (May, pg. 220.)

Train Cost on Intercolonial Ry.—Answering a question in the Senate recently Senator Lougheed said:—The cost of running a train of 400 tons from St. John to Halifax, not including any charges for repairs, wear and tear or other overhead expenses, but charges for enginemen and trainmen, wages, fuel, water, lubricants, other locomotive and train supplies, is $170.36, based on January expenses for freight trains.

A Better Farming Special Train is to be run by the C.P.R. in co-operation with the Saskatchewan Agricultural College, and will probably start about June 15, going over the Weyburn-Lethbridge line, also on the main line west of Moose Jaw, and over the Expanse, Express and Vanguard branches, it being the intention to hold about 90 meetings.

The Railway Storekeepers' Association's annual convention was held at Washington, D. C., May 18 to 20, when the reports of the various committees and a number of papers were read and discussed. The social features of the convention, which included a reception by the President of the United States, were well looked after.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canada Steamship Lines, Ltd., N. W. VAN WYCK has been appointed Freight Claims Agent. All claims correspondence heretofore addressed to W. E. Burke, Merchants Mutual Line, A. V. Collins, Canadian Lake Line, and L. A. W. Doherty, Inland Lines, are now forwarded to him. Office, Montreal.

A press report states that E. COX has been appointed press representative of the company.

In connection with the appointment of C. D. SECORD as Assistant Superintendent, as announced in our last issue, we are officially advised that he has been appointed Assistant Superintendent of Freight and Passenger Steamers. It is understood that his duties are concerned with the hulls. Office, Toronto.

Canadian Northern Ry.—A. W. SYMES, heretofore clerk in Freight Traffic Department, Montreal, has been appointed Travelling Freight Agent, Toronto.

R. F. McNAUGHTON, Travelling Passenger Agent, Saskatoon, Sask., is reported to have been appointed Travelling Passenger Agent, Edmonton, Alta.

Canadian Pacific Ry.—D. H. MAPES, heretofore Assistant to the Superintendent of Building Construction, has been appointed Superintendent of Building Construction, Eastern Lines, vice F. L. Ellingwood resigned. Office, Montreal.

S. P. ROBINS, Chief Draughtsman, is reported to have been appointed General Inspector Car Shops, Montreal.

E. MARSHALL, heretofore General Foreman, McAdam Jct., N.B., has been appointed Locomotive Foreman, Bay Shore, N.B.

F. L. WILLIS, heretofore assistant Locomotive Foreman, has been appointed Locomotive Foreman, McAdam Jct., N.B.

W. WELLS has been appointed General Foreman, McAdam Jct., N.B., vice E. Marshall, transferred.

P. L. JOHNSON, Assistant Trainmaster, Farnham, Que., is reported to have been appointed Trainmaster at Toronto.

A. J. PENTLAND, heretofore Night Locomotive Foreman, Swift Current, Sask., has been appointed Locomotive Foreman, Ignace, Ont., vice H. J. Reed transferred.

N. B. JONES has been appointed Car Foreman, Kenora, Ont., vice H. K. York transferred.

H. K. YORK, heretofore Car Foreman, Kenora, Ont., has been appointed Car Foreman, North Transcona, Man.

O. GLEASON, heretofore Assistant Agent, Winnipeg, has been appointed General Agent, Fort William, Ont., vice C. E. Legg, appointed Trainmaster, Winnipeg Terminals.

D. D. COSSAR, heretofore Night Locomotive Foreman, Moose Jaw, Sask., has been appointed Locomotive Foreman, Transcona, Man.

F. JOHNSON has been appointed Night Locomotive Foreman, Transcona, Man.

J. McLEAN, day yardmaster, Winnipeg, is reported to have been appointed day yardmaster, Transcona, Man.

D. BELL, heretofore storekeeper, Broadview, Sask., has been appointed storekeeper, North Transcona, Man.

Dr. A. W. MOODY is reported to have been appointed Chief Surgeon, Western Lines, vice Dr. R. J. Blanchard resigned.

P. S. LINDSAY, District Master Mechanic, District 2, Manitoba Division, Winnipeg, having returned from leave of absence, F. W. NICKS, who was acting during that period, has resumed his duties as locomotive driver out of Winnipeg.

A. PEERS, heretofore Locomotive Foreman, Winnipeg, has been appointed District Master Mechanic, Winnipeg Terminals.

G. PRATT, heretofore Locomotive Foreman, Souris, Man., has been appointed Locomotive Foreman, Winnipeg, roundhouse, vice A. Peers transferred.

R. SPROULE, Shop Foreman, Fort William, Ont., is reported to have been appointed Shop Foreman, Winnipeg roundhouse, vice F. Johnson, transferred.

C. E. LEGG, heretofore General Agent, Fort William, Ont., has been appointed Trainmaster, Winnipeg Terminals.

J. DUNCAN has been appointed Assistant Roadmaster, Winnipeg Terminals.

H. J. REED, heretofore Locomotive Foreman, Ignace, Ont., has been appointed Locomotive Foreman, Souris, Man., vice G. Pratt transferred.

G. A. DELACHEROIS, heretofore transitman, has been appointed Resident Engineer, Saskatoon, Sask., vice K. A. Dunphy transferred.

P. J. MURPHY, heretofore storekeeper, Regina, Sask., has been appointed storekeeper, Broadview, Sask., vice D. Bell transferred.

T. H. HORTON, heretofore storekeeper, Crowsnest, B. C., has been appointed storekeeper, Regina, Sask., vice P. J. Murphy transferred.

H. C. McMULLEN, General Livestock Agent, Calgary, Alta., has resigned. It was reported that he was to be transferred to the Assistant Freight Traffic Manager's office at Winnipeg, but press reports state that he has decided to remain in Calgary.

C. MALCOLM has been appointed chief clerk, Stores and Mechanical Accounts Department, Alberta Division, vice W. Mitchell resigned. Office, Calgary.

E. COTTY has been appointed Manager, Hotel Palliser, Calgary, Alta., vice G. H. Rawlins, deceased, whose appointment was only reported in our last issue.

A. STURROCK, heretofore Erecting Shop Foreman, Vancouver, B.C., has been appointed General Foreman, Ogden Shops, Calgary, Alta.

F. S. QUICK has been appointed Manager, Banff Springs Hotel, Banff, Alta., vice G. H. Rawlins, appointed to the Hotel Palliser, Calgary, Alta., and since deceased.

B. WILSON, heretofore temporary storekeeper, Crowsnest, B.C., has been appointed storekeeper, Strathcona, Alta.

E. J. BURKE, heretofore billing clerk, Ogden, Alta., has been appointed storekeeper, Crowsnest, B.C., vice T. H. Horton transferred.

K. A. DUNPHY, heretofore Resident Engineer, Saskatoon, Sask., has been appointed Resident Engineer, Vancouver Terminals, B.C., vice P. M. Smith resigned.

W. WORTMAN, heretofore gang foreman, Winnipeg, has been appointed Erecting Shop Foreman, Vancouver, B.C., vice A. Sturrock, promoted.

C. L. REEVE has been appointed chief clerk, Stores and Mechanical Accounts Department, British Columbia Division, vice R. Capstick deceased. Office, Vancouver.

Chicago, Milwaukee & St. Paul Ry.—A. J. Taylor, Canadian Freight and Passenger Agent, Toronto, having been granted a year's leave of absence, on account of ill health, his duties are being performed by W. H. D. Snasel, Travelling Freight and Passenger Agent.

Grand Trunk Pacific Ry.—F. G. ADAMS, Commercial Agent, G.T.R., Winnipeg, has also been appointed Division Freight Agent, G.T.P.R., there, vice W. J. Hunter deceased.

W. J. P. McGREGGOR, heretofore Commercial Agent, G.T.R., Moncton, N.B., has been appointed Division Freight Agent, G. T.P.R., Edmonton, Alta., vice F. G. Adams, transferred.

The following station agents have been appointed,—Justice, Man., R. W. Gibson; Pope, Man., C. L. Bennett; Uno, Man., E. A. Theriault; Lazare, Man., A. G. Redford; Pocahontas, Alta., R. J. Elder; Three Hills, Alta., J. N. McKeegan; Coalspur, Alta., E. B. Elgood; Lovett, Alta., D. McCuish; Mount Park, Alta., D. S. McCready.

Grand Trunk Ry.—H. A. LAIRD, heretofore chief clerk, General Freight Agent's office, Montreal, has been appointed City Freight Agent, there, vice V. G. Snell, promoted.

The following station agents have been appointed,—St. Liboire, Que., P. J. Hamel; Lindsay, Ont., F. Sandy; Peterboro, Ont., A. McNabb; Ekfrid, Ont., M. A. Smith; Brunner, Ont., Pass., J. Reis, Jr.; Dalkeith, Ont., J. O'Connor; Golden Lake, Ont., J. L. Foster; Wilno, Ont., J. H. Boyd.

Great Northern Ry.—R. BUDD, heretofore Chief Engineer, has been appointed Assistant to the President. Office, St. Paul, Minn.

A. H. HOGELAND, heretofore Consulting Engineer, and formerly Chief Engineer, has been appointed Chief Engineer, vice R. Budd, promoted. Office, St. Paul, Minn.

Intercolonial Ry.—H. JARDINE, heretofore Resident Engineer, Truro, N.S., has been appointed Assistant Engineer, Moncton, N.B.

G. MANNING is reported to have been appointed night foreman, St. John, N.B., vice J. Golding, retired under the pension rules.

National Transcontinental Ry.—We are officially advised that no one has been appointed Resident Engineer at Graham, Ont., succeeding the late F. D. FRIEND, as the work is practically finished there.

North Shore Railway.—It is announced that the New Brunswick Government has appointed M. F. KEITH, M. D., of Moncton, as Manager of the North Shore Railway Co., Ltd., without salary, under the provisions of the New Brunswick statutes 4 George V., chap. 57.

White Star-Dominion Line.—CHARLES MASON, heretofore in the District Passenger Agent's office, G.T.R., Montreal, has been appointed Travelling Passenger Agent, White Star-Dominion Line. Headquarters, Montreal.

Canadian Railway Institute, Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital, and office at Montreal, to print and publish books, pamphlets, charts, etc., pertaining to the common arts and sciences, and especially those relating to locomotive and general engineering, railway and canal construction, etc., and to take over the Canadian School of Locomotive and Train Operation, Montreal, and for other purposes. The incorporators are:—F. J. Jones, mechanical and air brake instructor; W. J. Hatch, air brake inspector; C. A. Martin, J. J. C. Wight and J. P. Wynn, locomotive drivers, Montreal.

Earth Sticking to Dump Cars can be prevented by covering the bottom of the cars with sheet zinc. A large contractor in New York is said to have found this out, after trying, without success, galvanized iron and sheet iron.

Electric Railway Department

Electrical Equipment for Mount Royal Tunnel, Canadian Northern Railway.

Canadian Railway and Marine World, for Dec., 1913, contained a general description of the electric locomotives for Mount Royal tunnel and the Montreal terminal. Following is a more detailed account of some of the apparatus on the locomotives, and also a description of the 8 multiple unit car equipments and substation apparatus:

LOCOMOTIVES.—The motors on each locomotive will consist of 4 CGE-228 commutating pole type motors. These have a standard rating of 315 h.p. each, or a total of 1260 h.p. per locomotive. The magnetic frame will be practically octagonal in shape, and of the box type construction. The frame is provided with bored openings at each end through which the armature, pole pieces, and field coils can be inserted or removed. The frame heads carrying the armature shaft bearings will be supported in the recess ends of the magnet frame, and will be held in place by tap bolts, which will be securely locked against turning. In each head will be two tap holes diametrically opposite, and when bolts are screwed into these holes the frame head will be forced off.

The armature bearing housings containing the bearing sleeves will have liberal sized pockets for holding oily waste, which will be held against the shaft on the low pressure side of the bearing. The heads will be provided with auxiliary oil wells for gauging the depth of the oil and inserting new oil. The 4 exciting field coils will be located at the sid s, top and bottom of the frame, and the 4 commutating coils will be located in the corners of the frame at an angle of approximately 45 degrees to the horizontal. The motor frames will have large hand holes for inspection at each end, which will be closed by covers with gaskets. The opening through the frame over the commutator will be large and inclined at an angle, allowing easy access to the commutator and brush holders. The cover over the commutator will be held in place by a spring locking device, no part of which will project above the top of the motor.

The armature bearing linings will be made of bearing metal with a thin layer of babbit sweated to the bearing shell. The armature bearings will be lubricated by means of oil and waste, and the waste will be held against the shaft on the low pressure side of the bearing. Waste oil from the armature bearing will be prevented from entering the interior of the motor by a series of oil deflectors which will throw it into grooves in the heads from which it is conducted away. Axle caps will be tongued and bolted to machined surfaces on the frame, which will be inclined at an angle of 60 degrees to the horizontal. The bearings will be lubricated by means of oil and waste, and the caps will be provided with auxiliary oil wells. The motor will provide a 7 in. diameter of axle in the motor bearings.

The field coils will be all wound with strip copper, the whole being mummified and insulated with varnished cambric and heavy tape. The armature core will be built up of soft iron laminations and mounted on a steel spider. The laminations will he keyed to the spider, and the spider in turn keyed to the armature shaft. The armature will be so constructed that the shaft may be removed without disturbing the commutator or windings, as the commutator and armature heads will all be located on the spider. The armature is especially designed to give thorough ventilation, so that the forced draught will circulate through longitudinal holes in the armature and over the surfaces of the armature and field coils. The armature shaft will be of special high grade steel, and the keys of treated steel, the thrust collars being made from steel drop forgings shrunk on the shaft.

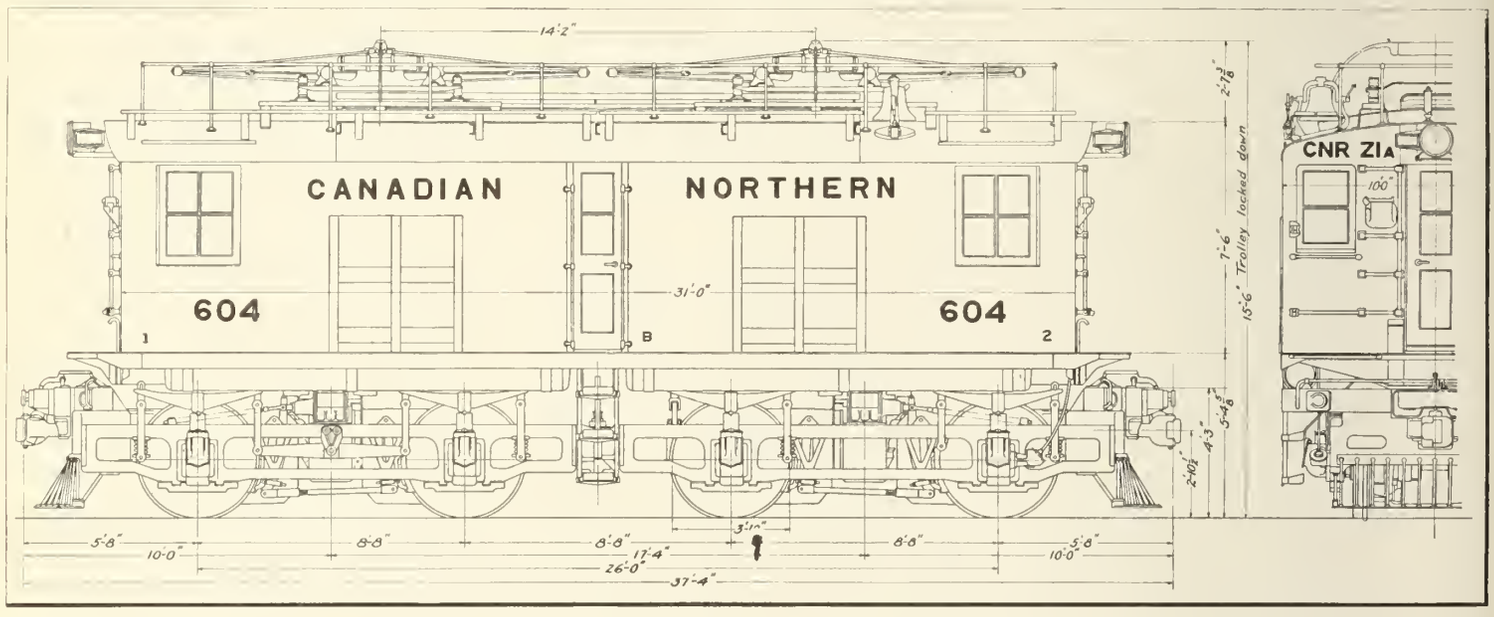
The commutator shell and cap will have the surfaces accurately machined and insulated with the best grade of mica. The commutator bars will be of hard, drawn copper, machined accurately to gauge, and will be insulated from each other by the best grade of mica. The commutator will be mounted directly on the spider and may he removed without disturhing the windings or punchings.

Each brush holder will rest on a support which will consist of two mica insulated studs pressed into a drop forging. The support will be secured to the frame against accurately machined seats by tap bolts accessible from the outside of the motor frame. The brush holder bodies will be secured to the brush holder supports on accurately machined seats. The brushes will slide in finished ways and will be pressed against the commutator by fingers which will give a practically uniform pressure throughout the working range of the brushes. The arrangement of springs actuating the fingers is such that there will be but slight pressure on the pins on which the fingers pivot. This will prevent any tendency of the fingers to stick on the pins and will reduce wear to a minimum.

The magnet frame will carry an opening for a flexible connection to a low pressure blower. Air will be forced in at the opposite end from the commutator, through the field coils and over the armature, then under the commutator through the armature heads and punchings. Gears will be of rolled steel forgings and the pinions of special treated high grade steel. Each motor will have two pinions, one mounted on each end of the armature shaft. Each set of gears and pinions will have 4 in. faces and the teeth will he cut to a diametral pitch of 2½ ins.

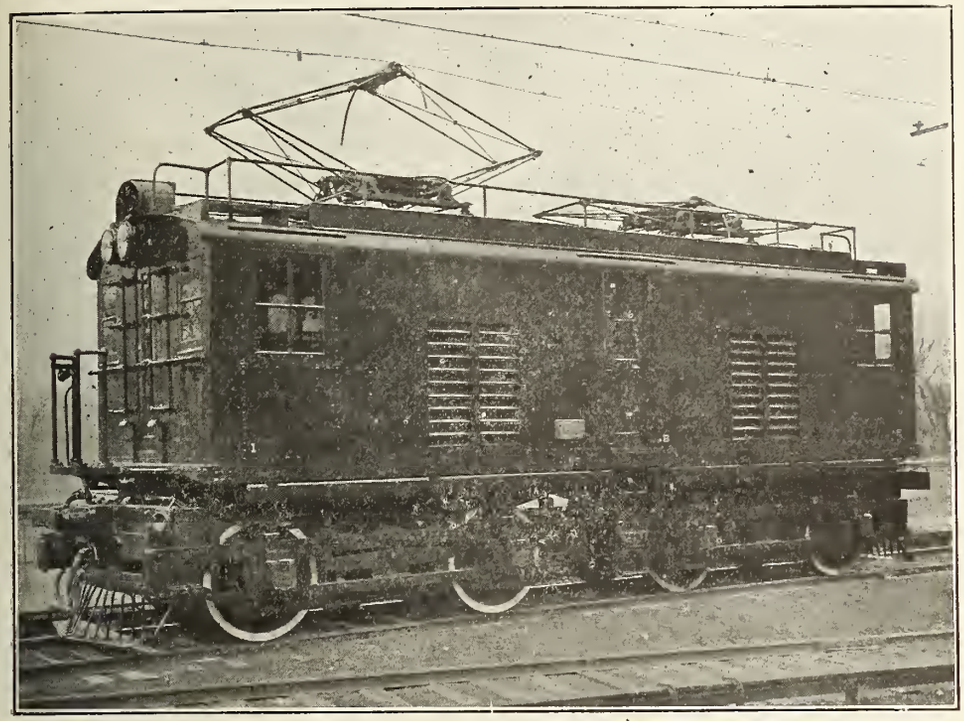
The contactors which will handle the main current will have the operating coils energized from 125 v. supply from a motor generator set, and will be removed by special insulation some distance from the contact tips which will carry the 2,400 v. energy. An insulating wooden rod will connect the contact lever to the solenoid plunger, the principle of operation of these contactors being similar to 600 v. type.

The arc chute will have a very powerful magnetic blow out and arching horns of considerable length extending from the contact tips, consequently, the ends of the arc will move rapidly over comparatively cold metal, causing a minimum burning of arc chute sides are a positive rupturing of the arc.



Side and End Elevations, Electric Locomotives, Mount Royal Tunnel.

The main motor and auxiliary fuse boxes will all be provided with a very effective magnetic blow out, which will be energized by the current passing through the fuse, and have hinged covers to facilitate fuse renewals. Fuses will be of the copper ribbon type, having a hole in the centre to localize the heating. These fuse boxes will be all



Electric Locomotive of Similar Type to those ordered for Mount Royal Tunnel.

arranged to blow into a common chamber arranged to take care of the arc.

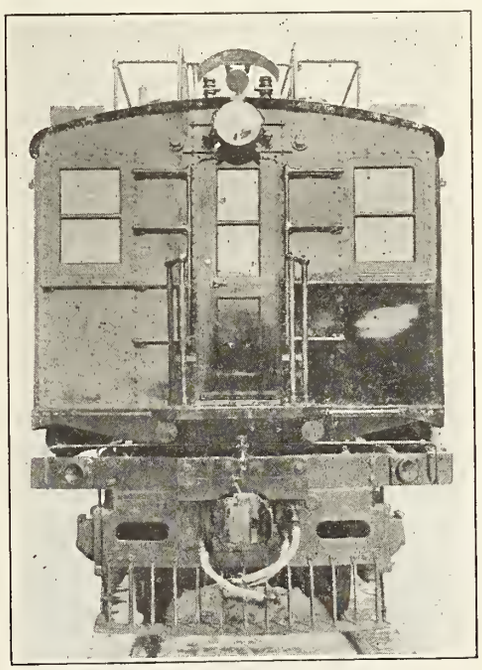
The motor generator set will consist of a 125 v. generator of suitable size to take care of lights, head light and control circuits, direct connected to and driven by a 2,400 v. motor having two 1,200 v. commutators. A fan for providing air to blow through the main motors will be direct connected to one end of the motor shaft.

MULTIPLE UNIT CAR EQUIPMENT.—Each of the 8 multiple unit cars will be supplied with 4 CGE-239 motors, of the commutating pole type, fully ventilated, wound for 1,200 v. and insulated for 2,400 v. Two of these motors will be permanently connected in series for 2,400 v. operation. Their standard rating will be 125 h.p. each, or a total of 500 h.p. per car. In the construction of these fully ventilated motors, the pinion end frame will be provided with a ring which will divert the air discharge from the armature fan through the openings in the head, while the incoming air will be drawn through a screened intake. This construction will insure a definite longitudinal circulation of air through the whole interior of the motor.

The Sprague GE type M multiple unit control will be provided, the design arrangement and construction being such that it will be equally well adapted for either single car or train operation. The control equipment will include a motor generator set for supplying 600 v. current for the control circuits, air compressor and lights. This set will consist of 2 1,200 v. motors, operating in series at 2,400 v., direct connected to a 600 v. generator.

The construction of the motors and control apparatus will be essentially of the same general type as for the corresponding items used on the electric locomotive equipments. The method of heating the cars will be very satisfactory on account of the excellent distribution of hot air secured. The heating equipment will consist of a heating unit, blower and regulating mechanism, the controlling switch and thermostat of the regulating mechanism being arranged for operation from the 600 v. supply. Air will be forced over the heating unit and distributed to the car through air ducts along the sides of the car.

SUBSTATION EQUIPMENT. — Power will be purchased at 62½ cycles 11,000 v., and the present equipment of the substation, which will be located near the west portal of the tunnel, will consist of 2 1,500



End View, Electric Locomotive.

k. w. C.G.E. motor generator sets. Each of these sets will be four bearing, and consist of 2,750 k.w. compound wound commutating pole generators, wound for 1,200 v. and insulated for 2,400 v., direct connected to 11,000 v. synchronous motor. The generators will be provided with pole face windings, and will be capable of carrying extremely heavy overloads, the overload capacity of each set being 200% load for one half hour and 300% load for 5 minutes. Three bearing 125 v. motor generator exciter sets will be supplied, each 125 v. 50 k.w. compound wound commutating pole generator being driven by a 550 v. 3 phase induction motor. The switchboard will consist of 32 panels of natural black slate and be 58 ft. long over all. The switchboard will make provision for considerable future extension.

All the apparatus above mentioned is being furnished by the Canadian General Electric Co.

Electric Railway Finance, Meetings, Etc.

Brantford St. Ry.—Grand Valley Ry.—The matters connected with the settlement of the litigation arising out of the affairs of the company in which the City of Brantford, Ont., is interested, were mentioned in the Second Appellate Division of the Ontario High Court, May 4. It was reported that the settlement negotiations were proceeding satisfactorily, and the cases were further enlarged.

The Brantford City Council, on May 4, finally passed the bylaw to raise $270,000 by debentures for the purchase of these lines.

British Columbia Electric Ry., and allied companies.—Gross earnings for March, $717,251; operating expenses, maintenance, etc., $516,007; net earnings, $201,244, against $720,493 gross earnings; $520,667 operating expenses, maintenance, etc.; $199,826 net earnings, for March, 1913. Aggregate gross earnings for nine months ended Mar. 31, $6,752,082; net earnings, $1,828,859, against $6,402,921 aggregate gross earnings; $1,826,664 net earnings for same period 1912-13.

Calgary Municipal Ry.—The following table, prepared by Commissioner Graves, shows the revenues to April 30, and the expenses to Mar. 31:—

	Revenue.	Op'r. Exp.	Revenue per car mile.	Op'r Exp. per car mile.
1912—				
Jan.	$37,575.90	$23,370.98	27.752	17.261
Feb.	35,178.05	28,819.89	26.636	21.882
March	40,051.30	24,525.71	27.828	17.041
April	43,887.50			
	$156,692.75	$76,716.58	82.216	56.184
1913—				
Jan.	$56,738.00	$44,893.07	24.139	19.099
Feb.	51,631.00	40,005.65	23.694	18.359
March	58,294.85	42,659.92	24.023	18.359
April	60,646.45			
	$227,310.30	$127,558.64	71.856	55.041
1914—				
Jan.	$57,640.20	$53,238.92	20.484	18.920
Feb.	52,063.95	44,398.53	20.747	17.693
March	56,606.70	47,480.43	21.019	17.630
April	57,025.70			
	$223,336.55	$145,117.88	62.250	54.243

Cape Breton Electric Co.—Gross earnings for March, $26,550.60; operating expenses and taxes $16,357.81; net earnings $10,192.79; interest charges $5,249.39; balance $4,943.40; bond sinking improvement funds $1,190; balance for reserves, depreciation, etc., $3,753.40, against $28,099.37 gross earnings; $15,965.83 operating expenses, taxes, etc.; $12,133.54 net earnings; $4,891.66 interest charges; $7,241.88 balance; $1,190 bond sinking and improvement funds; $6,051.88 balance for reserves, depreciation, etc., for Mar., 1913. Aggregate gross earnings for three months ended Mar. 31, $81,633.87; net earnings, $31,015.16; interest charges, bond sinking and improvement

funds, $19,278.12; net balance, $11,737.05, against $86,076.24 aggregate gross earnings; $35,344.42 net earnings; $17,976.11 interest charges, bond sinking and improvement funds; $17,368.31 net balance, for same period 1913.

The shareholders have decided to increase the preference stock issue from $250,000 to $500,000, to provide for extensions. There is an outstanding common stock issue of $1,625,000.

Saskatoon Municipal Ry.—Receipts for March, $12,330.38, against $9,978.11 for Mar., 1913. Passengers carried, 274,186, against 293,255 for Mar., 1913. Total mileage, 53,807, against 51,048 in Mar., 1913. Operating expenses, $8,149.78; interest on debentures and sinking fund, $3,392.00; total, $11,541.78. The decrease in earnings is due to the fact that a full car service was not operated in the earlier part of the month owing to the breakdown of the generators in the power house in February.

The gross earnings of the line to Sutherland for March were $1,271.10, and the operating expenses, including interest and sinking fund, were $832.

Saskatoon Municipal Ry. — The city auditor reported to the Saskatoon, Sask., City Council, May 12, that the deficit in the operation of the city's electric railway for the first quarter of this year was $14,480.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for March, $836,328; operating expenses, maintenance, etc., $435,685; net earnings, $400,643, against $772,491 gross earnings; $405,788 operating expenses, maintenance, etc.; $366,703 ne earnings, for March, 1913. Aggregate gross earnings for three months ended Mar. 31, $2,461,956; net earnings, $1,185,577, against $2,267,732 aggregate gross earnings; $1,083,306 net earnings, for same period 1913.

The earnings for the Toronto Ry., for April, were $501,435, and the aggregate for four months ended Apr. 30, $1,975,304.

Winnipeg Electric Ry., and allied interests.—Gross earnings for March, $347,812; operating expenses, $206,393; net earnings, $141,419, against $329,016 gross earnings; $189,950 operating expenses; $139,066 net earnings, for March, 1913. Aggregate gross earnings for three months ended Mar. 31, $1,081,461; net earnings, $435,786, against $1,000,945 aggregate gross earnings; $433,570 net earnings, for same period 1913.

Woodstock, Thames Valley and Ingersoll Electric Ry.—The Ontario High Court made an order, April 23, transferring the control of this line from E. B. Stockdale, Receiver of the Grand Valley Ry., to J. G. Wallace, Woodstock, Ont., representing the bondholders of the W., T. V. and I. E. R.. Mr. Wallace has been Superintendent in charge of operation for some years.

The Ontario West Shore Railway Muddle.

The enquiry into the condition of the partially completed Ontario West Shore Ry., undertaken by the Ontario Railway and Municipal Board, at the instance of the towns of Goderich and Kincardine, and Ashfield and Huron townships, was concluded at Toronto, May 1. As announced in Canadian Railway and Marine World for May, the Chairman, D. M. McIntyre, stated at the previous sitting, Apr. 21, that it would perhaps be unfair to close the enquiry without giving J. W. Moyes, the President of the company, an opportunity to make a statement, but if he did not attend on May 1, the enquiry would be closed. Although a promise was made on his behalf that he would be present, he did not attend at the last sitting of the Board, and instead, it was announced that, acting on his doctor's advice, he had gone to Algonquin Park for the benefit of his health. Subsequent to the issue of the Board's report on the case, a warrant was issued for his arrest, and enquiries showed that he was not staying at any place in Algonquin Park, and apparently that he had not been there. Various rumors as to his whereabouts have been circulated, but none of those concerned with the matter profess any actual knowledge.

Following is a summary of the Board's report: The company was originally incorporated in 1902 as the Huron, Bruce and Grey Electric Ry., to build an electric railway from Goderich southerly, northerly and easterly, and in 1903 the name was changed to the Ontario West Shore Electric Ry., and additional powers were granted, and in 1906, the time for the commencement and completion of the lines was extended, and the Ontario Railway Act made applicable to the company. In 1909 the name of the company was changed to the Ontario West Shore Ry. The share capital was fixed at $500,000, and the company was authorized to issue bonds for $15,000 a mile, which, upon the mileage of the section to be built first, it was assumed, would authorize the issue of $600,000 bonds. During 1908, the four municipalities mentioned guaranteed the company's bonds for $400,000, as follows: Goderich, $150,000; Kincardine, $50,000; Ashfield Tp., $125,000, and Huron Tp., $75,000, and in consideration of these guarantees, the company bound itself to complete the railway between Goderich and Kincardine. The Toronto General Trusts Corporation was appointed trustee under the bond guarantees, and was authorized, upon receiving from time to time progress certificates by the company's Chief Engineer, certifying to 90% of the value of the service and materials done or supplied to the date of such certificates, to pay out of the proceeds of the guaranteed bonds, two-thirds of the 90% as set out in the progress certificates. J. W. Moyes, President of the company, negotiated the sale of the bonds and deposited the proceeds, amounting to $384,000, with the trustee. Construction was begun in the autumn of 1908 and continued throughout 1909, 1910 and part of 1911. Progress certificates for various sums, signed by the Chief Engineer, were presented to the trustee and the regular proportions paid over. In all, 57 certificates were presented from July 27, 1908, to Oct. 3, 1911, for a total of $639,949.79. Upon these certificates, the trustee paid to J. W. Moyes, representing the company, two-thirds of 90%, totalling $383,969.94. This exhausted the proceeds of the guaranteed bonds, with the exception of $30.06, and on Sept. 7, 1911, J. W. Moyes ordered that construction be stopped. The line was far from complete, and the work was not resumed. The company defaulted on the interest, and the bondholders called upon the municipalities to fulfill their guarantees. The municipalities took up the matter with the company, without effect, and in Oct., 1912, they engaged H. W. Middlemist, A. M. I. C. E., to investigate and report on the condition of the railway. The detailed report was dealt with fully in Canadian Railway and Marine World for Apr. 1913. Briefly summarized, it showed that the value of the work done and materials furnished, including 5% for engineering expenses, and 15% profit, was $305,200.75. Assuming these figures to be correct, there should have been paid out on progress certificates, $183,120.46, figured at two thirds of 90%, whereas there was overpayment of $200,849.48.

The first date upon which it was settled to commence the enquiry, was May 30, 1913, but the Board, learning that J. W. Moyes, who, as President, had been most active in the company's affairs, was absent from Canada, and without his testimony little progress could be made, the appointment was adjourned sine die. The actual hearing commenced Sept. 19, 1913, and sittings were held at various dates. Evidence of some of the company's officials showed that all books and papers relative to the work, had been handed over to J. W. Moyes, and to him accordingly, whose attendance for examination had been procured with some difficulty and after a long delay, the Board looked for discovery of the facts, but was disappointed. While his memory refused to recall with accuracy individual transactions recorded in the bank ledgers, even the application of a cheque for so large an amount as $15,000, the totally unexpected and disconcerting turn which his testimony took when asked to produce the company's books and papers, promised to land the investigation in an impasse. The evidence shows the unsatisfactory character of his testimony, which throughout was characterized by shifty evasion, and, as subsequently developed, by bold reiterated falsehood. His story, under oath, was that he resigned the presidency of the company about a year prior to the time at which he was speaking, and that he had himself sent all the books and papers connected with the company's affairs, to S. C. Smoke, Vice President, since deceased. A search among the late Mr. Smoke's papers, by his business partners, failed to disclose any such papers, with the exception of certain minutes of meetings for a few months in 1908, concerned only with the legal organization of the company. The enquiry had been piloted into a cul de sac by J. W. Moyes, and there, no doubt, he intended it should end, and yet, as afterwards appeared, this story, so solemnly affirmed and reaffirmed by him, was an infamous fabrication. Dead men tell no tales, and appreciating this, with shameless cynicism and calculating cunning, he sought to unload on the deceased Vice President, the vanished books and papers, with all the odium attaching to their disappearance.

In January last, it was learned that a trunk and parcel of papers, probably relevant to this enquiry, had come into the hands of the city police, in virtue of the execution of a search warrant issued at the instance of J. W. Moyes against W. M. Baxter, in whose possession they were found. An inspection proved that these were the long sought books and papers, and they were handed over by the Board to a chartered accountant for examination and report. The accountant's testimony disclosed that no systematic record of the company's business had been kept. The only books he could find were a cash book and a ledger, in each of which only a few entries were made, and those referring to transactions in 1908. During the three years when the major portion of the work was done, not a single entry was made in the books. The examination also showed that eight different bank accounts had been kept, at Toronto and Goderich, five of them being in the name of J. W. Moyes, to each of which, some part of the company's money could be traced. The task of making any complete record of transactions was complicated by multiple entries, transfers, missing cheques, vouchers, etc., but after this was done, so far as was humanly possible, evidence is still wanting of the destination and legitimate disbursement of many thousands of dollars.

Evidence was given during the enquiry, by V. M. Roberts, Chief Engineer of the company, upon whose progress certificates the amounts were paid over by the trustee, and

it was shown from documents among the company's papers that he had failed in his duty as certifying engineer. He was unable to produce any memoranda showing the various computations on which he based the progress certificates, and his explanation of the method shows that it was not in accord with the terms of the trust deed, he stating that he made his calculations on a percentage basis of the whole contract, and that he had instructions from J. W. Moyes to prepare his estimate on the contract price. A large number of progress certificates in blank, signed by the Chief Engineer, were also found among the papers, showing that he had abdicated his functions and placed himself completely in the hands of J. W. Moyes, facilitating the latter's fraudulent purposes. As an instance of how the certificates were expanded,—in 1909 a quantity of steel rails were purchased for $16,937.50, and a progress certificate was prepared and presented for $28,229.17, which amount when reduced by 10% and by one third of the remainder, makes the precise amount of the account for rails. During 1909-10-11, it became necessary to meet the interest coupons, and J. W. Moyes drew $58,900 on false progress certificates, when not a dollar of the amounts went into construction. The former Secretary of the company, in his evidence, stated that all the payments at Goderich and Toronto of which he has knowledge, on account of construction, were $228,272.06, made up as follows:

Pay rolls and accounts paid at Goderich		$153,905.55
Ties (1909)		9,598.07
Rails	$74,275.40	
Less 30% paid in unguaranteed bonds at par	22,282.62	51,992.78
Right of way		6,777.66
Timber		1,000.00
Additional construction, about		5,000.00
		$228,272.06

In addition to the foregoing, it is probable that payments were made from Toronto, for a locomotive, $2,000, and for legal expenses.

The guaranteed bonds, with principal and interest, produced $402,837.37, and it is reasonably certain that $228,272.06 has been properly expended on the construction of the railway. This leaves to be accounted for, $174,565.31, and the Board places the burden of accounting for this where it properly belongs, on J. W. Moyes. How much of this balance was legitimately applied for purposes of the railway, it is unable to say from the material at command, but documentary evidence makes it clear that of this balance which was all paid out to J. W. Moyes, large sums were deliberately misappropriated, as cheques and vouchers show approximately $122,000 applied to other purposes, apparently personal.

The Board arrived at the following conclusions:—That J. W. Moyes, by false and fraudulent representation that $12,500 had been paid on account of the capital stock, procured the company to be permanently organized; that no permanent capital was contributed beyond the proceeds of the sale of bonds guaranteed by the municipalities, although $15,000 of unguaranteed bonds appear to have been taken in part payment of steel rails; that J. W. Moyes, in breach of the Ontario Railway Act, procured a colorable agreement for the construction of the railway, between the railway company, and the Huron Construction Co., which latter was in fact, himself; that by procuring to be issued false and fraudulent progress certificates, he withdrew from the Toronto General Trusts Corporation, the proceeds of the sale of the guaranteed bonds, and the Chief Engineer, by his gross negligence and breach of duty, aided and abetted J. W. Moyes in his fraudulent design; that owing to the fact that no books of account of the company's business were kept, and that many vouchers for payments are missing, the Board cannot report with exactness how much of the amount so fraudulently withdrawn by J. W. Moyes, has been properly expended, but it is clear that while several thousands of dollars were applied to purposes foreign to the railway, $228,272.06 was properly expended in railway construction and materials; that the assets of the company consist of right of way, which has been acquired for the entire distance, except about 12 parcels, and construction work and materials, according to the corrected valuation of H. W. Middlemist, C. E., is worth $276,021.21; that all the company's liabilities known to the Board are the bonds guaranteed by the municipalities, of a par value of $400,000, and a parcel of unguaranteed bonds of the par value of $15,000, both of which are secured by a mortgage on the undertaking, and besides, there are outstanding unsecured accounts of approximately $2,000.

Prosecution for Sale of Intoxicating Liquor to Electric Car Crew While on Duty.

What is reported to be the first case under the recently amended section of the Ontario Railway Act, which makes it a serious offence to supply intoxicating liquor to a train crew while on duty, was heard at Windsor, Ont., May 5, when A. Reaume of the Brighton Beach Hotel, was, on pleading guilty, fined $10 and costs, amounting to $16.50, for selling liquor to the conductor and motorman of a Sandwich, Windsor and Amherstburg Ry. car running between Ojibway and Sandwich Springs. The case was laid on the information of James Anderson, Manager, S., W. and A. R., and the magistrate in imposing the penalty, stated that he did not want to make it too heavy, this being a first offence, but any future offenders would be dealt with as severely as the law allowed. He also emphasized the fact that it was an extremely dangerous practice to sell liquor to men driving street cars.

Sec. 244 of the Ontario Railway Act, covering the point, reads as follows,—

Every person who sells, gives or barters any spirituous or intoxicating liquor to or with any servant or employe of any company while actually employed in the course of his duty on a train or car or while in uniform or in connection with the operation of a train or car, is liable on summary conviction to a penalty not exceeding $25, or to imprisonment with or without hard labor for a period not exceeding one month, or to both.

Pitt River Bridge, Coquitlam, B. C.—The British Columbia Government received tenders to May 26 for the construction of the substructure and the erection of the steel work for the bridge across the Pitt River at Coquitlam. It is expected that the work will be started July 1, and completed within two years. The estimated cost is $700,000. It would, however, have been considerably more, but the Government purchased from the C.P.R. the superstructure of its single track bridge across the Pitt River, about 200 yards south of the proposed traffic bridge, which has been replaced by a double track bridge. The bridge, it is proposed, shall carry tracks for an electric railway, for which the Western Canada Power Co. holds a charter. The projected line will run from Vancouver to Mission City.

The Regina (Sask.) Municipal Railway has indefinitely postponed the proposed purchase of 4 double truck cars for which tenders were invited recently.

Operating Results of Calgary Municipal Railway.

Following is the statement for the calendar year 1913, of this line, of which T. H. McCauley is Superintendent:—

REVENUE.		
Car earnings:		
Passengers	$733,218.89	
Chartered cars	1,994.05	
Freight	735.37	
Street sprinkling	6,000.00	
		$741,948.31
Miscellaneous earnings:		
Advertising	$10,643.59	
Post card sales	111.50	
Commissions	9.15	
		10,764.24
General revenue:		
Bank interest	$15,013.74	
		15,013.74
Total revenue		$767,726.29
OPERATING EXPENSES.		
Maintenance of way and structures:		
Track and roadway	$16,299.17	
Electric lines	5,712.00	
Buildings and fixtures	1,397.21	
		$23,408.38
Maintenance of equipment:		
Cars (bodies and trucks)	$53,840.94	
Electric equipment of cars	15,490.41	
Miscellaneous equipment	50.85	
Shop expenses	3,367.61	
Elec. vehicles, operation.	508.15	
		73,257.96
Transportation:		
Hired power	$151,320.32	
Superintendence	6,745.20	
Wages of conductors	119,017.09	
Wages of motormen	119,016.94	
Misc. car service employes	1,059.23	
Car service supplies	16,043.34	
Misc. car service expenses	2,003.79	
Cleaning and sanding track	8,608.20	
Removal of snow and ice	1,868.30	
Operation of sprinklers	2,217.94	
		427,900.35
General Expenses:		
Salaries of general officers	$5,880.00	
Salaries of clerks	7,116.22	
Printing and stationery	949.86	
Misc. office expenses	1,793.27	
Advertising and attractions	443.19	
Misc. general expenses	5,118.86	
Damages	18,041.72	
Rent of land and buildings	1,293.75	
Insurance	3,511.26	
Store expenses	625.49	
Elec. vehicles, operation.	116.72	
Contingencies	6,234.62	
		51,124.96
		$575,691.65
Less credit per stock account; increase in stock on hand between Dec. 31, 1912 and 1913		537.92
Total operating expenses		$575,153.73
Debenture interest		71,671.98
Debenture sinking fund		34,007.95
Taxes		2,452.27
Rental charged by City of Calgary on land and conduits		931.68
Profit and loss		298.64
Surplus		83,160.04
		$767,726.29
Disposition of surplus:		
Carried to depreciation replacement account		$70,266.64
Carried to net revenue account		12,893.40
		$83,160.04
MISCELLANEOUS STATISTICS.		
Car miles		3,040,214
Car hours		348,218
Fare passengers		18,355,274
Transfer passengers		6,478,332
Total passengers		24,833,606
Average fare, revenue passengers		3.994c
Average fare, all passengers		2.952c
Car earnings per car mile		24.404c
Misc. earnings per car mile		.354c
Gross earnings per car mile		24.758c
Car earnings per car hour		$2.13070
Misc. earnings per car hour		.03091
Gross earnings per car hour		$2.16161
Operating expenses per car mile		18.918c
Operating expenses per car hour		$1.65170
Employes (Dec., 1913)		350

As a city railway system tends to centralize business and spread out the residence area, its action is both centripetal and centrifugal. It is serving the best interests of the community in opposite directions.

Canadian Electric Railway Association's Annual Meeting.

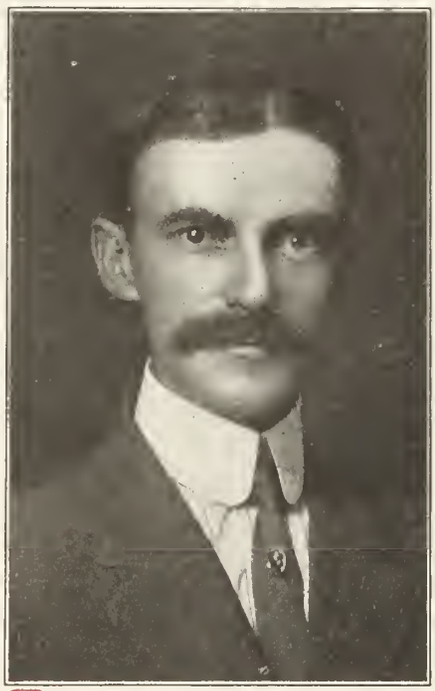
The annual meeting held at the Chateau Laurier, Ottawa, May 13, was well attended by officials of member companies throughout the Dominion, and was very successful in every way.

The chair was occupied by the President, Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co., who opened the meeting with an address dealing with the Association's work.

The Cornwall St. Ry. Light and Power Co., Ltd., Cornwall, Ont., and the London and Lake Erie Ry. and Transportation Co., London, Ont., were admitted to membership by unanimous vote.

The Secretary-Treasurer, Acton Burrows, Managing Director, Canadian Railway and Marine World, presented a very comprehensive report dealing with the Association's work during the past year and covering a wide range of other subjects, including the following: Change of Association's name; membership of Association; representation of Association at Atlantic City conventions; compensation for carrying postmen on electric railways; compensation for carrying postal mail; taxation of electric railways in Ontario; Dominion subsidies for municipal hydro electric railways in Ontario; enquiries for information; power brakes for electric railway cars; the brake question in Detroit; point in development of street railway properties in which the maximum return on the investment is being received; track laying; staggering joints or placing ends of rails opposite each other; use of T rails in cities; bonding through or around special work; street sprinkling for municipalities; payment towards cost of oiling macadamized roads; trolley suspension wires attached to municipal combination lamp poles; mileage of rolled steel and steel tired wheels; materials used in armature bearings, etc.; cost of power per kilowatt hour; information for cost recorder departments; speed for cars in cities; keeping brooms in car vestibules; statistics of employes' wages; statistics of hours of labor on Sundays; conductors and motormen reporting late for duty; motormen and conductors exchanging positions; smoking on street cars; conditions for crossing steam railway tracks; fares on interurban and suburban lines; Sunday fares; workmen's tickets; employes' transportation; portable fare boxes for city lines; difficulties with portable fare boxes; collection of fares on interurban lines; freight, express and switching tariffs; transfers on interurban lines: transportation of newspapers; payment by advertising companies for placing cards in cars; the working of public utility commissions; duty on continuous rail joints; miscellaneous statistics as to funded debt, bonds, mileage, etc.; miscellaneous statistics as to population served, track mileage, revenue, passengers, etc.; preparation of papers for annual meeting; financial statement.

The following papers were read and discussed: "Prevention of Accidents," by A. E. Beck, Claims Solicitor, British Columbia Electric Ry.; "A Few Disconnected Ideas on Street Railway Operation," by F. D. Burpee, Superintendent, Ottawa Electric Ry.; "The Diesel Crude Oil Engine as Applied to Electric Railway Operation," by A. H. Dion, General Superintendent, Moose Jaw Electric Ry.; "Floral Work at Railway Stations," by E. T. Cook, F.R.H.S.; "Recent Developments in Electric Car Equipment," by W. G. Gordon, Transportation Engineer, Canadian General Electric Co.; "Construction Accounting," by E. P. Coleman, General Manager, Dominion Power & Transmission Co., Ltd.; "Use of Steel in the Construction of Electric Railway Cars," by J. A. Wilson, Superintendent of Car Department, Ottawa Car Manufacturing Co.; "Loyalty



P305 C. B. King,
Manager London St. Ry., and President Canadian Electric Railway Association.

in Electric Railway Work," by A. M. Smith, Master Mechanic, Toronto and York Radial Ry.; "Safety First," by A. Gaboury, Superintendent, Montreal Tramways Co. The

P334 James D. Fraser,
Director and Secretary-Treasurer Ottawa Electric Ry. Co., and Vice President Canadian Electric Railway Association.

above mentioned papers are copyrighted by the Association and will be printed in its annual proceedings and distributed to officials of member companies.

The officers, etc., were unanimously elected as follows: President, C. B. King, Manager, London St. Ry., London, Ont.; Vice President, J. D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Ry., Ottawa, Ont.; Secretary-Treasurer, Acton Burrows, Managing Director, Canadian Railway and Marine World, Toronto, re-elected for the eighth successive year; Executive Committee: E. P. Coleman, General Manager, Dominion Power & Transmission Co., Ltd., Hamilton Ont.; A. Eastman, Vice President and General Manager, Windsor, Essex and Lake Shore Rapid Ry., Kingsville, Ont.; H. M. Hopper, General Manager, St. John Ry., St. John, N.B.; Wilson Phillips, Superintendent, Winnipeg Electric Ry., Winnipeg, Man.; C. L. Wilson, Assistant General Manager, Toronto and York Radial Ry., Toronto; Assistant Secretary, Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World, Toronto.

On the first day of the meeting the representatives were entertained to dinner at the Ottawa Golf Club by the Ottawa Electric Ry. Co., the chair being taken by its President, T. Ahearn. The toasts were responded to by Hon. W. H. Thorne, Director, St. John Ry. Co.; H. H. McLean, K.C., M. P., President, St. John Ry. Co.; Patrick Dubee, President, C.E.R.A.; C. B. King, Vice President, C.E.R.A.; and Acton Burrows, Secretary-Treasurer, C.E.R.A. W. Y. Soper, Vice President, Ottawa Electric Ry., who is probably the best amateur sleight of hand performer in Canada, gave a very interesting exhibition which was greatly appreciated. The party were conveyed to and from the Ottawa Golf Club on a special multiple unit train on the Hull Electric Ry. On the second day of the meeting the Hull Electric Co. gave a luncheon at the Chateau Laurier at which its General Superintendent, G. Gordon Gale, M. Can. Soc. C. E., presided. The officials of the Ottawa Electric Ry., especially J. D. Fraser, Director and Secretary-Treasurer, and F. D. Burpee, Superintendent, and also G. Gordon Gale, General Superintendent, Hull Electric Co., were most assiduous in their attention to the visitors, and rendered much assistance in making the meeting one of the most successful and enjoyable in the Association's history .

The Ottawa Electric Railway Co. has started a safety first campaign in Ottawa. Permission has already been obtained from the school boards to hang safety first calendars, such as are used in Brooklyn, N. Y., in each class room, and arrangements have been made with moving picture houses to run safety first films. The Montreal Tramways Co.'s campaign will be followed in a modified form, by educating and instructing the company's employes, obtaining the assistance of the newspapers and attempting to educate the public generally along safety first lines.

The District Motor Bus Co. is operating a service between the Campbell Block, Victoria, and Metchosin, B. C., giving three trips a day on week days with an extra trip from Victoria at 11 p.m. on Saturday. Two trips are made on Sundays, with an extra leaving Metchosin at 6 p.m. The time occupied on the trip is 70 minutes; the single fare is $1 and the return fare $1.50. Parcels weighing up to 100 lbs. are carried, the minimum charge being 25c.

The travelling public of a city is like the soil of a farm—neglect it and poor results follow; give it attention and it yields large returns.

The rapidity and scope of development of city railway car design during the last five years has no parallel in industrial history.

Interurban Cars for the Nipissing Central Railway.

The Nipissing Central Ry. placed an order recently for two interurban cars, a floor plan of which is shown herewith, which will have a total seating capacity of 52 in the three compartments. Following are some of the principal dimensions: Length over buffer, 51 ft.; over vestibules, 50 ft.; over body, 40 ft.; centre to centre of trucks, 28 ft.; width over sheathing, 8 ft. 9½ ins.; aisle width, 1 ft. 10 ins.; height from rail to underside of side sills, 3 ft. 1 in.; height from rail over roof, 12 ft. 4 ins.; height from floor to top of window sill, 2 ft. 5 ins.; and height from vestibule platform to floor of car, 10 ins.

The underframing will be of steel throughout, comprising essentially two centre sills of 7 in. 17½ lb. I beams spaced 12½ in. centres, extending from end sill to end sill, with a ¼ in. cover plate top and bottom, extending from bolster to bolster, and two side sills of 6 by 3½ by 7-16 in. angles extending from end sill to end sill, with a 3-16 in. truss plate, 30 ins. deep, extending from end sill to the baggage door post, with the side sills under the baggage door reinforced by a 6 by ⅝ in. plate, 9 ft. long. Pine side sills resting on the short flange of the steel side sill, will be bolted to the latter. The end sills will be built up of a 9 by ⅜ in. steel plate, having a 6 by 3½ by 7-16 in. angle along the bottom outer face. The wooden end sills will be of oak. The side and centre sills will be tied with 4 in. 6¼ lb. channels at each side of each bolster, and braced diagonally each side of the bolster with 4 in. channels. There will be 5 intermediate cross bearers of 4 in. 6¼ lb. channels, evenly spaced, and two crossbearers of 4 in. 7½ lb. I beams, located 4 ft. each side of the car centre line, extending beneath the sill .

The vestibule platform is dropped 10 ins. below the car level, the side sill knees being 3-16 in. plate 12 ins. deep at the end sill plate, reinforced top and bottom with 2 by 2 by ¼ in. angles, and secured to the underside of the sills. The centre sill knees will be two 6 by 3½ by 7-16 in. angles, extending from the bumpers to 4 ft. back from the body bolster. The bumpers will be 6 in. 8 lb. channels, bent to the contour of the vestibule end, and with the top bevelled back at 45 degress and covered with sheet iron.

The flooring will be of 1 by 2½ in. yellow pine, laid longitudinally with a special mat surface. The platform flooring will be hard maple, ⅞ by 2½ in. The floor will have trap doors. The body posts will be of ash 2½ ins. thick. The car roof is to be of the single arch type, supported on 14 steel carlines, 1¾ by ½ in., with intermediate ash carlines at 10 in. centres. The roof boards will be ½ in. thick, covered with no. 8 canvas.

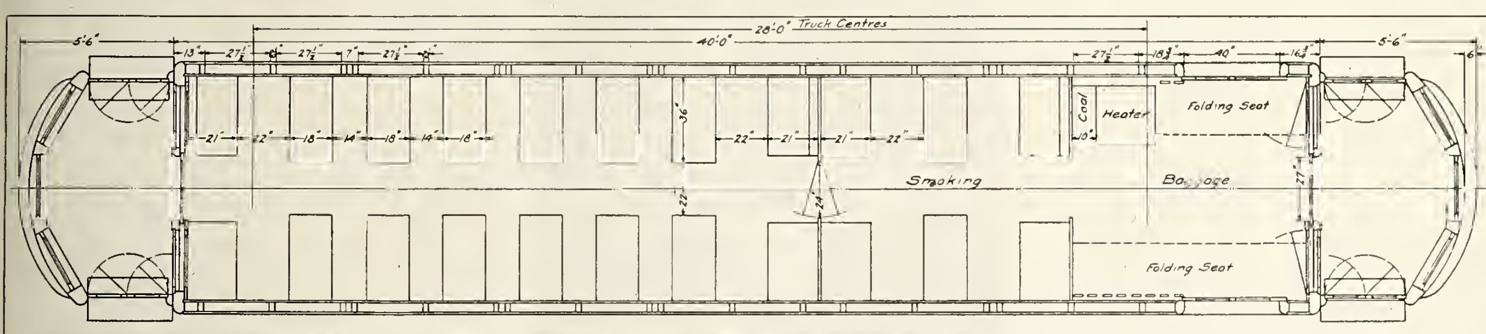
There will be a 24 in. swinging door between the general and smoking compartments, and a single sliding door in each bulkhead. The vestibule doors will be folding, in two parts, hinged against the bulkhead, and fitted with automatic folding apparatus. The car steps will be 36 ins. wide, double at each door, the lower one with a 10 in. tread, and the upper one with a 9 in. tread, with 10 in. risers. There will be 14 reversible seats, 36 ins. long, on a single pedestal and spring upholstered in rattan. There will also be 8 stationary cross seats of similar construction, and two folding seats, one along each side of the baggage compartment.

The heating will be provided for by a forced draught heater in the baggage compartment, and there will be 10 ventilators, five on each side of the roof. The equipment will also include destination signs, signal bells, hand straps, fare register, arc headlight, signal whistles, etc. The car lighting will be by two rows of pendant lights along the ceiling with a 3 lamp cluster in each vestibule.

The air brake equipment will be the Westinghouse A.M.M. type, supplied by a D.I.E. G. compressor with a 600 volt motor. It will have a type J governor, M 15 D brake valves, B 6 feed valves, M 1 triple valve, a type R, 10 by 12 in. brake cylinder, B 3 conductor's valves and 3½ in. air gauges illuminated by a 6 volt lamp. There will also be a geared hand brake equipment at each end of the car.

The trucks will be M. C. B. 2 type, with a 6½ ft. wheel base. The wheels will be 33¼ ins. diam., steel tired with retaining rings, and with cast steel centres. The tires will be 5 ins. wide by 3 ins. thick, and the axles, with 4¼ by 8 in. journals. The motor equipment on these cars will be the Westinghouse 306 type, with four motors, two on each truck, with a controller in each end of the car. The car will also be equipped with an integrating wattmeter, rated at 600 volts, 400 amperes.

The order for the two cars has been given to the Preston Car and Coach Co.



Floor Plan of Interurban Car, Nipissing Central Railway.

The Quebec Public Utilities Commission on May 1, granted the application of the Montreal Tramways Co. for a further adjournment of the hearing in regard to fares, etc., until after the appeal to the Imperial Privy Council is decided. The particular point at issue is the order made by the Commission that the company produce all its books for an investigation by an accountant. The company disputed the jurisdiction of the Commission to make this order, and took the matter to the Superior Court, which upheld the order. This finding was endorsed by the Court of Appeal, and a further appeal to the Imperial Privy Council is being made.

The Windsor, Essex and Lake Shore Rapid Ry. has two 55 ft. passenger cars on order with the Tillsonburg Electric Car Co.

Electric Railway Notes.

The Ottawa Electric Ry. has added a rail bonding car to its equipment.

The Toronto and York Radial Ry. has received two double end, double truck cars from Preston Car and Coach Co.

The Montreal Tramways Co. has recently received 20 steel underframe street cars from Canadian Car and Foundry Co.

The Nipissing Central Ry. has arranged to inaugurate a 15 minute service on the line between Cobalt and Haileybury, Ont., June 1.

The British Columbia Electric Ry. has let a contract for the erection of an ornamental arched entrance to the Central Park, New Westminster, B. C., at a cost of $4,000.

A bureau of fare research has been established by the American Electric Railway Association and placed in charge of F. W. Doolittle, as director.

The Edmonton Radial Ry. has received two single end, double truck, p.a.y.e. city cars, similar to those already in service, from Preston Car and Coach Co.

The Montreal Tramways Co. has issued a circular to its employes dealing with the safety first movement, and enclosing a folder of advice on the subject.

The Regina, Sask., City Council has refused to accede to the request of representatives of the working men in the city, for a reduced fare, viz.—eight tickets for 25c., during the noon hour, on the municipal railway.

The London and Lake Erie Ry. and Transportation Co. put its summer rates between London and Port Stanley, Ont., into operation April 26, effective to Oct. 31.

The Board of Railway Commissioners has dismissed the Essex Terminal Ry. application objecting to an order removing the company from participation as a carrier, in tariffs and supplements applicable to international traffic.

The American Electric Railway Association's annual convention will be held at Atlantic City, N. J., Oct. 12 to 16. Boston and Washington were both considered, but neither of them could furnish the accommodation required at the time required.

The Port Arthur Electric Ry. has received three single truck, double end, p.a.y.e. city car bodies, mounted on Brill 21 E trucks, 8 ft. wheel base, from Preston Car and Coach Co. The cars are being equipped at the railway shops at Port Arthur.

The Edmonton, Alta., City Council has directed the putting into operation of a straight 5c. fare on the Edmonton Radial Ry. The increased rate went into operation May 17. Limited tickets are still sold at 8 for 25c., and children's tickets 10 for 25c.

The Imperial Privy Council, May 7, granted special leave to the Montreal Tramways Co. to appeal against the decision of the Que-

bec Courts regarding the jurisdiction of the Quebec Public Utilities Commission to order the company to produce documents, etc. The Dominion Attorney General will be allowed to intervene in the appeal if necessary.

The Saskatoon, Sask., City Council has under consideration a report of the Commissioners to the effect that the fares now charged on the municipal railway be raised so that the deficit, which has been growing larger month by month may be cut down. The suggestion is to charge a straight 5 cent fare, and to retain the present school children's and workmen's limited tickets.

The Ottawa Electric Ry. is arranging to have a series of lessons given in the Ottawa public schools on safety first. Illustrations are being prepared showing how accidents of various kinds occur in connection with the operation of the electric cars, and moving picture scenes will be shown, all of which will be explained by the teachers. The general public will be reached through the newspapers, and by the distribution of illustrated leaflets.

The London, Ont., Advertiser says:—"A. N. Warfield, ex-expert, ex-promoter, ex-hydro canvasser and ex-general factotum in the late electrification campaign, is at the present time busily engaged in the organization of a company for the manufacture of the cars that will be used on the line to Port Stanley." The idea of organizing a company to build the comparatively few cars that will be required by the London and Port Stanley Ry. is rather amusing.

The Moncton Tramways, Electricity and Gas Co. is considering the purchase of three single truck cars and one double truck car during this year. The company is installing three 200 h.p. boilers of high pressure, to replace four low pressure boilers which have been in service for several years. A portion of the plant is already equipped with high pressure boilers, and when these additional ones are installed, the entire plant will be worked by high pressure boilers. A. B. Coryell is Superintendent.

A press dispatch from Regina, Sask., May 12, says: "Those who are responsible for the operation of the municipal electric railway, are said to have come to the opinion that the present rate of excess of operating expenses over revenue promises to be of such proportions that steps must be at once taken to cut down the loss." The methods suggested are:—cutting down the service on certain lines, straight 5c. fare, with a 3c. fare for school children, and during certain limited hours, and the stopping of Sunday service.

International Suburban Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title to build a railway in Essex and Kent Counties, Ont., and to connect the same by ferry or tunnel across the Detroit River, with Detroit, Mich., and to use gasolene, steam or other motive power for operation. The lines specified in the application would extend from Ojibway through Sandwich, Windsor, Walkerville and Ford City to Belle River, and thence easterly to Chatham; and from Ojibway southwesterly to Amherstburg, Ont. Rodd, Wigle and McHugh, Windsor, Ont., solicitors for applicants.

As a result of a further conference between the civic authorities of Winnipeg and the Public Utilities Commissioner of Manitoba, the routes on certain streets have been rearranged, the cars will stop on the near side of the streets in the central parts of the city; the number of cars in service during rush hours will be increased and all new cars provided will be of the p.a.y.e. type.

Personal Paragraphs.

P. J. SLATTERTY, who died at Sault Ste. Marie, Ont., May 3, was at one time Manager of the old street railway in Sherbrooke, Que.

DAVID ROSS, B.A.Sc., formerly in the Engineering Department, Toronto Ry., was married at Toronto, May 16, to Miss J. N. Huffman.

D. W. HOUSTON, heretofore acting Superintendent, Regina Municipal Ry., Regina, Sask., has been appointed Superintendent, vice H. Doughty, resigned.

The Winnipeg Board of Control has approved of the appointment of K. G. DUFF as inspector of traffic, and of J. MOONEY, as temporary assistant of traffic, on the recommendation of H. P. Lewis, Traffic Superintendent.

GEORGE KIDD, heretofore Comptroller, British Columbia Electric Ry., Vancouver, has been appointed General Manager

P387 W. G. Murrin,
General Superintendent, British Columbia Electric Railway.

there, vice R. H. Sperling, promoted. Prior to going to British Columbia, he was Secretary of the company in London, Eng. During Mr. Sperling's recent absence in London, he was appointed acting General Manager.

R. H. SPERLING, heretofore General Manager, British Columbia Electric Ry., Vancouver, of whom some biographical particulars and whose portrait were published in our last issue, has been appointed Assistant to the Chairman of the Board, and a director of the company, with office in London, Eng. He has been in British Columbia for 16 years, first in Victoria, and latterly in Vancouver, and he leaves in July for England, where he assumes his new duties, Aug. 1. His position is a new one, and has been created on account of the rapid development of the company's work and the advisability of having an executive at the London office who is completely in touch with the operations in the actual field.

WILLIAM GEORGE MURRIN, whose appointment as General Superintendent, British Columbia Electric Ry., Vancouver, was announced in our last issue, was born at Greenwich, Eng., Aug. 27, 1875, and prior to entering electric railway service in Jan., 1899, was, from 1891 to 1893, a student at the Finsbury Technical College, London, Eng., and from 1893, in the City of London Lighting Co.'s shops and stations. From Jan., 1899, to 1901, he was shift engineer, Middlesbrough and Stockton Tramway Co., Stockton, Eng.; 1901 to 1904, Superintendent of Power, London United Tramways Co., London, Eng.; 1904 to Mar., 1913, Works Manager and Electrical Engineer, same company; Mar., 1913, to Mar. 30, 1914, Mechanical Superintendent, British Columbia Electric Ry., Vancouver, B. C.

CLAUDE BERNARD KING, who has been elected President, Canadian Electric Railway Association, and whose portrait appears in this issue, was born at Galena, Ind., Sept. 12, 1871, and entered transportation service in June, 1891, since when he has been, to Apr., 1895, in shops, and Storekeeper, Louisville Ry., Louisville, Ky.; Apr., 1895, to Jan., 1900, chief clerk to General Manager, Detroit Citizens St. Ry., Detroit, Mich.; Jan., 1900, to Nov., 1905, Assistant Division Superintendent and Assistant to the President, Detroit United Ry., Detroit, Mich.; Nov., 1905, he was appointed Manager, London St. Ry., London, Ont., which position he still holds.

JAMES DEWAR FRASER, who has been elected Vice President, Canadian Electric Railway Association, and whose portrait appears in this issue, was born at St. Andrews, Que., Mar. 26, 1851. From 1871 to 1882 he was accountant and telegraph operator, W. McClymont and Co., Ottawa; 1882 to 1891, Secretary-Treasurer, Ottawa City Passenger Ry. In 1891 he was appointed Secretary-Treasurer, Ottawa Electric Ry. Co., which position he still holds. In 1893, he was also appointed Secretary-Treasurer, Ottawa Car Co., and in 1906 was elected a director. In 1913 he was elected a director, Ottawa Electric Ry. Co., and in 1914, also a director of the Ottawa Traction Co. In addition to these positions he is a director and Secretary-Treasurer, Wallace Realty Co.

Edmonton Interurban Ry.—We are officially advised that the company is not at present entertaining any proposition for the building of a branch line to Fort Saskatchewan, Alta., as stated in recent press reports. (May, pg. 231.)

Forest Hill Electric Ry.—Members of York Township Council made a trip of inspection over the route of this projected railway, May 12, and as a result decided, May 13, to request the company to lay tracks, under its franchise, on the south side of Eglinton Ave., and on the west side of Dufferin and Bathurst Streets. (May, pg. 431.)

Grand Falls Electric Ry.—The New Brunswick Legislature has incorporated a company with this title to build an electric railway in Grand Falls, N.B. (See Grand Falls to Limestone, N.B., May, pg. 231.)

Hamilton, Ont.—Press reports state that a local syndicate is preparing to submit a proposition to the Barton Township Council for the construction of an electric railway along the mountain top near Hamilton, Ont. W. A. Crockett, Hamilton, is reported to be interested.

Nelson Street Ry.—We are officially advised that the lines, franchises and property of the N.S.R. Co. have been taken over by the city and the line is now being operated by the City Council. A. S. Horswell is Chairman of the Street Railway Committee, and F. C. Ingram has been retained as Superintendent. Nothing has been decided as to what alterations or extensions, if any, will be made this year. (Jan., pg. 38.)

Electric Railway Projects, Construction, Betterments, Etc.

Brantford St. Ry.—Grand Valley Ry.—The Ontario Legislature has authorized the Brantford City Council to take over and operate the G. V. Ry., which includes the old Brantford St. Ry., and the line from Brantford to Paris and Galt. The act provides for the appointment of a commission to manage the line. It is said that it is not intended to appoint such a commission until the municipal elections in Jan., 1915. In the meantime a manager will be appointed by the Council, and it was decided May 5 to advertise for one.

The city council at the same meeting authorized the Mayor to sign the agreement to purchase, which has now been approved by the courts, the ratepayers and the Legislature.

A survey of the line is being made by the City Engineer and J. Fair to check over the deeds for the right of way, and to ascertain that all is in order for the deed of transfer of the entire property to be made out.

It is said that nothing will be done in the way of betterment until the entire property of the company has been finally transferred to the city. (Feb., 1913. pg. 90.)

British Columbia Electric Ry.—Press reports state that an arrangement has been completed, to take effect early in June, under which the B.C.E. Ry. will receive traffic at the International Boundary at Sumas from the Chicago, Milwaukee and Puget Sound Ry., and handle it into New Westminster and Vancouver. The necessary connecting line has been built by the C.M. and P.S. Ry.

We are officially advised that excavation has been started at the site for the new car barns at Vancouver, but the plans for the building are not yet completed.

In regard to the reports as to connection with the Chicago, Milwaukee and St. Paul Ry., we are advised that they are much exaggerated. The fact is that the proposed arrangement, if carried out, will provide for an exchange of freight business only, and an interchange track will be laid at Sumas, at the International boundary, connecting the lines of the two companies, and there will be an interchange of freight traffic, under similar conditions to those obtaining where interchange arrangements have been made at other points with the C. P. R., the C. N. R., and the Great Northern Ry. The arrangements for the proposed new interchange have not yet been settled.

In connection with the project for the building of a steel bridge over the Brunette River, it is proposed to obtain plans for one of sufficient capacity to carry tracks for the electric railway, so that the company may take advantage of the franchise from the Burnaby Township Council for laying tracks along the North Road. (May, pg. 231.)

Calgary Municipal Ry.—The ratepayers of Calgary, Alta., defeated a bylaw, May 1, to provide $90,000 for a concrete sub-base under street railway tracks, and another one for the expenditure of $300,000 for additional equipment and extensions to the electric lighting and power plant. Neither of these bylaws obtained the necessary two-thirds majority. (Jan., pg. 38.)

Cape Breton Electric Co.—The Cape Breton, N. S., county council has authorized its officials to sign a supplementary agreement with the company respecting the building of an extension to New Waterford. (May, pg. 231.)

Dunnville, Wellandport and Beamsville Electric Ry.—The Dunnville, Ont., Township Council, has granted an extension of six months for the completion of the line under construction in the municipality. (May, pg. 231.)

Edmonton Radial Ry.—The Edmonton, Alta., City Council has decided to provide amusements of various kinds at the east end park, with a view of attracting traffic to the Highland St. car route, on which at present there is a considerable loss. (April, pg. 184.)

Guelph Radial Ry.—We are officially advised that the alterations to be made at the power house in Guelph, Ont., consist of dispensing with engine and boilers, and putting in car pits and stock rooms at a total cost of $3,500. A. H. Foster is Manager. (May, pg. 231.)

Hamilton St. Ry.—A bylaw has been passed by the Wentworth County Council authorizing the company to build a line on Main St., between Ottawa St. and Kenilworth Ave., Hamilton, Ont., about half a mile. The company is asked to pay $200 a mile a year for the piece of line.

The Hamilton City Council has been informed by the company that the work in progress on Kenilworth Ave. will be completed as soon as possible, and that the tracks on certain streets will be renewed. (May, pg. 231.)

Kingston, Portsmouth and Cataraqui Electric Ry.—The company has expressed its dissatisfaction with the specifications for track bed work on Princess St., Kingston, Ont., prepared by the City Engineer and T. H. Mather, Syracuse, N.Y., and has suggested that the Chief Engineer of Construction of the Montreal Tramways Co. be called in to settle the matters about which differences have arisen. The City Council has approved of the suggestion. The city has let the contract for the paving of the street, and the company has its rails, ties, etc., on hand, ready to proceed with the work as soon as the track bed is prepared. (May, pg. 231.)

London and Lake Erie Ry. and Transportation Co.—Press reports state that the company's steam power plant at London, Ont., has been overhauled and put into condition for use as an auxiliary plant during the summer. Steam is to be kept up, so that in case of a breakdown of the hydro-electric power plant at any time the car service will not be interrupted for more than 20 minutes. (April, pg. 184.)

Montreal and Southern Counties Ry.—The extension from Marieville to St. Cesaire, Que.. 9 miles, was opened for traffic, May 2. St. Cesaire is 31 miles from Montreal, and a service of four trains a day is given.

We are officially advised that the contract for the construction of the line between St. Cesaire and Granby has been awarded to Grant, Campbell & Co.

The bridge across the Yamaska River at St. Cesaire, which is being built by John Ross, was expected to be completed May 31. Work on the 15 mile extension from St. Cesaire to Granby is expected to be started at once, and the contract calls for completion in October. (May, pg. 231.)

Nipissing Central Ry.—The route of a projected extension of the line from Liskeard to North Timiskaming, Ont., will go round the edge of the lake, strike within a short distance of the Casey-Cobalt mines, and continue through a good farming district to North Timiskaming. A good route with easy gradients has been obtained. It is not definitely decided when construction will be arranged for, but local reports, May 1, stated that the people were desirous of having the work gone on with at once.

Press reports state that work was started, May 4, on the electrification of the Kerr Lake branch of the Timiskaming and Northern Ontario Ry. We are officially advised that when the work is completed the branch will be operated as part of the N.C. Ry. (Feb., pg. 88.)

Nova Scotia Tramways and Power Co.—After being under discussion in the Nova Scotia Legislature for several weeks the bill to incorporate a company was passed through the committee of the whole of the Legislative Assembly, May 13. The company was given the power it applied for to acquire the Pictou County Electric Co., with its electric railway, and the Halifax Electric Tramway Co., to which sections the opposition had been warmly directed. (May, pg. 232.)

Ontario West Shore Ry.—F. H. McGuigan, Toronto, accompanied by V. Roberts, formerly Chief Engineer on the construction of the line, went over this uncompleted line between Goderich and Kincardine, Ont., recently. Mr. McGuigan is reported to have said that he was acting entirely for himself in making the inspection, while Mr. Roberts is reported to have said he believed some plan for the completion of the line was being arranged. (May, pg. 232.)

Ottawa Electric Ry.—Press reports state that the equipment of a new steam auxiliary power plant on Middle St., Ottawa, is being installed, consisting of three Babcock and Wilcox water tube, marine type boilers, with chain feed stokers, and a 4,000 h.p. steam turbine. (Jan., pg. 39.)

Regina Municipal Ry.—Contracts have been awarded for the supply of the following street railway material:—65 tons steel T rail, Lorain section 80-335 and 1,200 bonds 4|0 B. & S. 10 1-8 ins., pressed terminals, to United States Steel Products; 1,000 track bolts and nuts, 3¾ by ¾ ins., to Peart Bros. Hardware Co., Regina; 9,000 barrels Canada Portland cement, to Canada Cement Co.; 2 miles 2|0 hard drawn round trolley wire, to Northern Electric Co.; 70 trolley frogs, 12 adjustable trolley crossovers, 600 straight line 15 ins. tinned line ears, 150 s.c. pull-overs and 180 car barn hangers, to Ohio Brass Co.

St. John Ry.—The car barn addition, to be erected on Wentworth St., St. John, will be of steel and brick construction, 58 by 115 ft. The work is to be started at once H. C. Mott, St. John, N.B., is the architect.

The contract for the projected new car barn on Wentworth St., is reported to have been let to A. R. C. Clarke and Son, St. John, N.B. (May, pg. 232.)

St. Thomas Street Ry.—The committee of the St. Thomas, Ont., City Council in charge of the street railway was informed, May 1, that the employes were engaged in rebonding the entire line. (Feb., pg. 88.)

Sandwich, Windsor and Amherstburg Electric Ry.—Work on the Ferry St. loop, Windsor, was ordered to be stopped by the City Council, April 30, on the ground that the bylaw granting permission to build had not been approved by the ratepayers and a permit for the extension had not been obtained from the Ontario Railway and Municipal Board. Legal proceedings had previously been taken in the matter, and an order obtained, April 23, from the Ontario High Court, permitting the company to proceed with the work at its own peril and without prejudice to the rights of the ratepayers who objected to the loop. The hearing of the main action was fixed for May 25. (May, pg. 232.)

Saskatoon Municipal Ry.—The ratepayers

of Saskatoon, Sask., voted, May 1, in favor of a bylaw to raise $25,000 for extensions to the municipal railway, and to raise $55,000 to reconstruct a portion of the Long Hill. This latter work is being undertaken in view of the early construction of an extension of the municipal railway.

The City Council decided, May 5, to resubmit the defeated bylaws to the ratepayers at an early date.

A contract is reported to have been let to Gunn & Sons, Winnipeg, Man., for grading work on what is known as the Long Hill. It is said that this work will be done preparatory to the construction of an extension of the electric railway.. (May, pg. 232.)

Toronto Eastern Ry.—A press report states that track is being laid on the section of this projected railway into Whitby, Ont. (May, pg. 184.)

Toronto Suburban Ry.—Grading was reported to have been completed on this line from Lambton to Guelph, Ont., May 18. There is a portion at the Lambton end upon which nothing has been done, and it is said that all matters in connection with the right of way easterly from Lambton have not yet been settled. Ties have been distributed along the route, and a considerable mileage of track has been laid from Cooksville and Acton, Ont.

In the discussions which took place in the House of Commons, on the Toronto, Niagara and Western Ry., it was stated on behalf of that company, that it owns or controls the charter of the T. S. Ry., and that the latter line is being built as part of its lines. (Feb., pg. 88.)

Transcona, Man.—At a recent special meeting of the Transcona, Man., Town Council, an agreement was approved under which J. H. Kern, Moose Jaw, Sask., is given a franchise for the operation of an electric railway in the town. The agreement calls for the completion of the following line by October:—From Nairn Road to King St., thence north to Regent Avenue, or to Transcona, and then back along to Leola St. and Oxford St., thence north to Stafford Ave., about six miles. The company's property is to be exempt from general taxation, and the city is to receive from 2%, rising to 10%, of the gross receipts. The cost of construction is estimated at $12,000 a mile for single track, but the builder may lay a double track line if he wishes. The agreement was signed April 25, and a bond of $10,000 has been filed with the Public Utilities Commission.

The Town Council had been in negotiation with the Winnipeg Electric Ry. relative to the building of such a line, but withdrew from the negotiations upon the question of the cost of subways. [See also Winnipeg Electric Ry.] (May, pg. 232.)

Windsor, Essex and Lake Shore Rapid Ry.—We are officially advised that it is expected to pave about 4,500 ft. on Howard Ave., Windsor, Ont., during this year. The towns of Essex and Leamington, Ont., also expect to do some paving on the streets on which the cars run, but the matter has not yet been fully decided. A. Eastman is Vice President and General Manager, Kingsville, Ont. (Jan., pg. 39.)

The Western Central Ry. Co.'s application to the Dominion Parliament for an extension of time for construction and for increased powers was withdrawn from further consideration before the Railway Committee of the House of Commons, April 30. The company has power to build lines from London to Windsor, from London to Toronto, and branches to Woodstock, Stratford and other points in Ontario. (July, 1911, pg. 685.)

Winnipeg Electric Ry.—The Winnipeg, Man., City Council has authorized the construction of a loop line round Portage, Clifton, Spruce and Classic Streets to enable the street cars to turn before entering the St. James subway. This is a temporary line, pending the construction of a modern subway.

The company has been notified by the City Engineer to place the trolleys on span wires between the ornamental poles now in use.

Stonewall and Rockwood municipalities agreed, April 29, to grant the company until Nov. 15 to complete the line to Stonewall, Man. It was to have been completed Dec. 1, 1913, but track was laid only as far as Stony Mountain. A power house is to be built for the line at Stony Mountain, and press reports state that plans for this building are completed and that a contract for its erection will be let at an early date.

Press reports state that the company has let grading contracts for the line from Stony Mountain to Stonewall to local contractors, and that the work is to be completed ready for tracklaying by June 30.

A car service was put in operation on Selkirk Ave. as far as McPhillips St., Winnipeg, May 9. Wilford Phillips, Manager, wrote the Winnipeg Board of Control, May 11, that the company does not intend to extend its tracks on Mountain Ave. west of Arlington St.

We are officially advised that the substation to be erected by the Winnipeg, Selkirk and Lake Winnipeg Ry. at Stony Mountain, Man., will have two small generator sets installed, and two transformers to supply light to the residents of the vicinity. The location and lay out of the building has not been fully decided on.

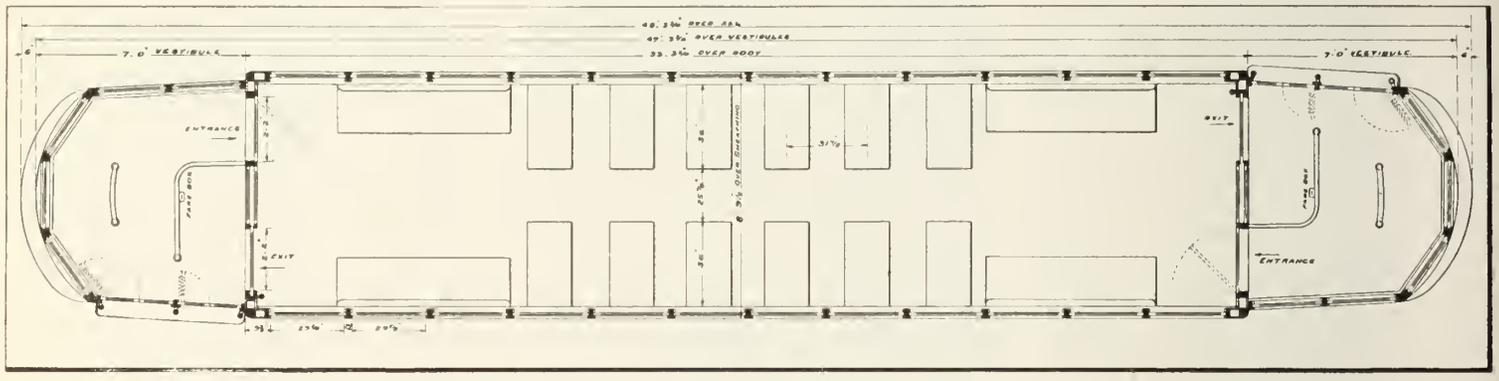
Plans for the extension of the line in Fort Garry from the present terminus to the end of Pembina Highway, near St. Norbert, were approved by the City Council, May 12.

In connection with the proposed electric railway in Transcona, press reports state that negotiations are in progress with the Canadian Northern Ry., which, if completed successfully, will result in the electrification of a portion of the Dundee branch, with which connection would be made by the extension of the present W. E. R. line running through St. Boniface to the Dawson Road. Such a line would not only serve Transcona, but also a wider area of St. Boniface than is at present served, as well as the new stockyards. To carry out this project, about three miles of the C.N.R. branch would be electrified. An alternative proposal is for the building of a special track for an electric railway on the C.N.R. right of way for three miles. [See also Transcona, Man.] (May, pg. 232.)

Woodstock, Thames Valley and Ingersoll Electric Ry.—Following the liquidation of the Grand Valley Ry., the W., T. V. and I. E. Ry resumes its independence, under the control of J. G. Wallace, its Superintendent, as Receiver for the bondholders. Press reports state that certain betterments will be undertaken at once, and that application will be made to the Woodstock, Ont., City Council for permission to extend the line along Dundas St. to the new fair grounds. Negotiations are said to be in progress for the use of hydro-electric power.

Interurban Cars for Toronto and York Radial Railway.

Two cars for service on the Toronto and York Radial Ry. have recently been delivered. A floor plan of the cars is shown herewith. These cars were built to replace the two that were burned when the company's Mimico division car barn was burned down last year.



Floor Plan, Toronto and York Radial Ry. Cars.

These cars are of the double truck, double end prepayment type. The underframes are of steel, and the sides, up to the belt rail, are also of steel. The vestibules are 7 ft. long, and the roof is of the turtleback type, equipped with automatic ventilators. The cars are mounted on Standard 0|50 trucks, and are equipped with Westinghouse S.M-1 air brakes.

The interior of the cars is in cherry, with a natural finish. The seats are spring upholstered, covered with rattan. These cars were built by the Preston Car and Coach Co., Preston, Ont.

Fort William Electric Ry.—The Street Railway Committee of the Fort William, Ont., City Council, decided, April 25, to start work immediately on the building of the new belt line. The first thing to be done was the putting in of the special work at the corner of Victoria and Syndicate avenues. The line is being built by day labor and work was started May 1. The extension to the Island across the bascule lift bridge is reported to be practically completed, and it was expected to be opened for traffic May 31. (May, pg. 231.)

Marine Department

New Icebreaking Steamship for the St. Lawrence River.

As stated in the last issue of Canadian Railway and Marine World an order has been placed by the Marine Department for the construction of a powerful icebreaking steamship for service on the St. Lawrence River between Quebec and Montreal.

The vessel is designed as an icebreaker only, the intention being that she will lay up during the summer season. The principal dimensions are as follows:—Length over all, 292 ft.; length, b.p., 275 ft.; breadth, mld., 57½ ft.; depth, mld., 32 ft.; draught, mean, 19 ft.; i.h.p., 8,000.

She will be of massive construction and will be classed 100 A1 at Lloyds. The general design is shown by the accompanying plan, the first correct one published, other plans published elsewhere having been preliminary sketches only. The stem, a massive steel casting, will be raked aft, and the stern, which will be of the cruiser type, will allow of easy propulsion and steering when going astern among ice.

The watertight subdivision will be very complete. There will be seven main transverse watertight bulkheads extending to the upper deck; the side bunker walls will also be watertight to the upper deck, and an inner skin will be provided between the forepeak and forward bunker; the bulkheads thus forming in conjunction with the double bottom, which will extend the full length of the ship, a double skin extending from the engine and boiler room bulkhead right forward. Access from below to these watertight compartments will be provided for by watertight doors. Large trimming tanks will be placed forward and aft, which will be connected with special pumping arrangements, so that the vessel may be quickly trimmed.

The framing will be composed of heavy channel, spaced 15 in. apart at the bow. The spacing being increased midships and aft, intermediate frames will be introduced in way of the ice belt for a certain distance about midships. These ordinary frames will be strengthend by heavy web frames and side stringers, placed so as to resist as efficiently as possible the heavy stress due to the pressure of the ice. The plating forward will be 1¼ in. thick, and an ice belt over 1 in. thick and 15 ft. deep will run right round the vessel. All this ice plating will be worked flush on the outside.

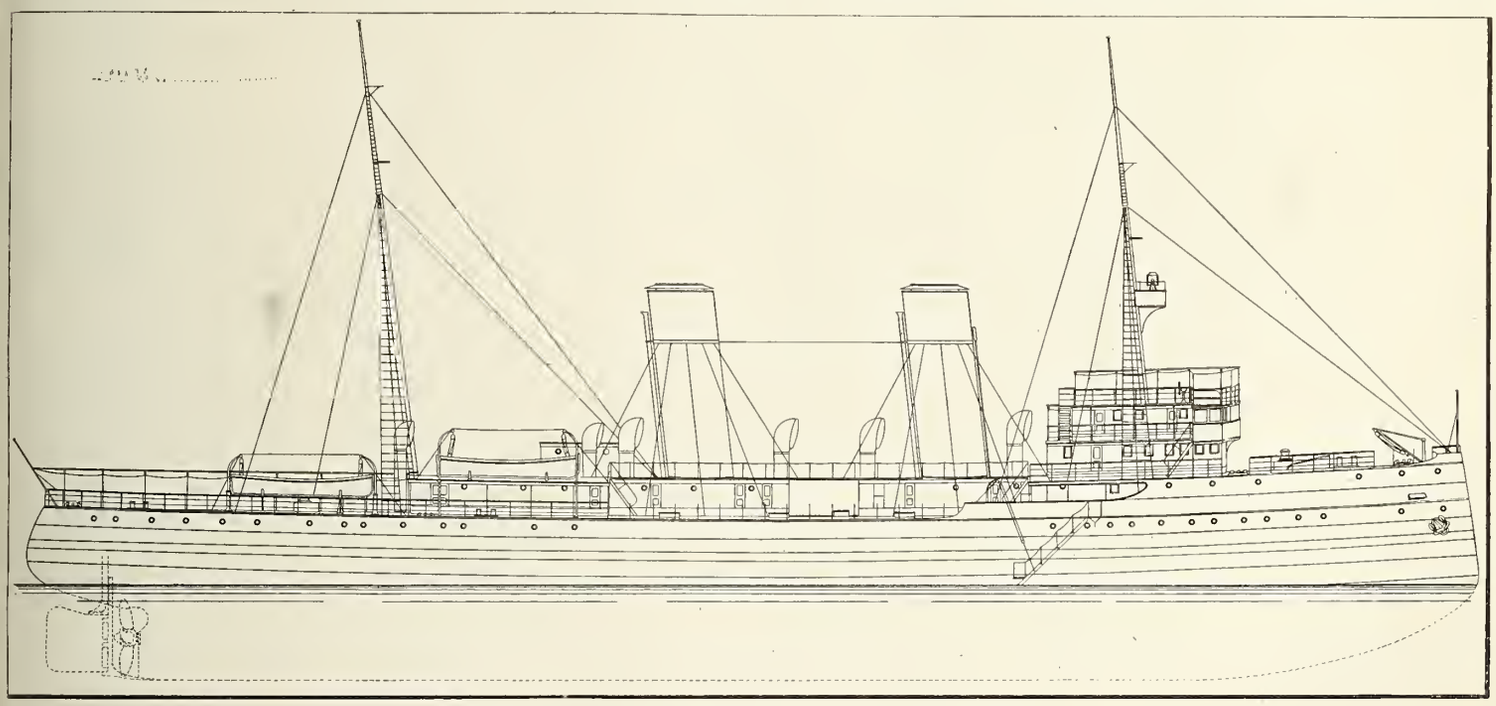
Accommodation on the main deck will be provided for the engineers and stewards, etc., while forward on the same deck will be quarters for the crew and petty officers. On the upper deck at the forward end of the casing will be the officers' quarters and mess room. The two galleys will be located on this deck in the casing, and will communicate with all messing quarters by dumbwaiters. In the forecastle will be two houses for cold storage, with cook's day stores alongside. On the forecastle deck will be the official accommodation, consisting of two official cabins, pantry, bath and w.c., and combined dining saloon and chartroom. The wireless cabin and operators' room will be on the boat deck aft. The captain's cabin and wheel house will be on the navigating bridge.

Complete hot and cold fresh water, sanitary and steam heating systems will be fitted throughout in the most up-to-date manner. The vessel will be electrically lighted throughout, and will be fitted with a searchlight of 25,000 candle power, situated on the fore side of the foremast. The current will be supplied by two direct current compound dynamos direct driven by high speed enclosed compound engines.

The lifesaving appliances will be in accordance with the latest rules of the Canadian Steamboat Inspection Act, and will include four lifeboats and one cutter. The deck machinery will consist of a powerful steam steering gear aft, controlled from the bridge by telemotor, and fitted with hand gear at the engine, a windlass, two capstans, and boat and coal hoists. Special attention will be given to the mooring and coaling arrangements.

The main propelling machinery will be of the twin screw, triple expansion surface, condensing type, capable of developing 8,000 i.h.p. in ordinary working. All shafting and moving parts generally will be greatly in excess of the usual scantlings, and a complete outfit of spare parts will be provided for both main and auxiliary engines. Independent air feed and bilge pumps of extra large capacity will be provided, and the engine room auxiliary equipment otherwise will be very complete. The six boilers will be of the marine return tube type, two double ended and four single ended. They will be constructed for a working pressure of 180 lbs. per sq. in. and will be arranged to work under Howden's system of forced draught. All the boilers will supply steam to the main engines, and connections for the auxiliary steam main will also be led from three of the single ended boilers. Ash ejectors and steam ash hoists will be provided in the various stokeholds. The piping, valves, mountings, etc., will be of the very highest class in both materials and workmanship, and no effort will be spared to make the installation as perfect as possible.

The construction of this vessel will be started immediately, as great progress has been made recently at the Vickers' works in Montreal, and delivery is guaranteed by Nov. 30, 1915, so that the vessel will be secured by the Government for the winter of 1915-16.



New Icebreaking Steamship for the St. Lawrence River.

The Stranding of the City of Sydney.

Commander H. St. G. Lindsay, R. D., R. N. R., Dominion Wreck Commissioner, assisted by Captains Neil Hall and R. MacDonald, as assessors, have given the following judgment in reference to the stranding of the s.s. City of Sydney, official no. 115,274, of Montreal, owned by the New York, Newfoundland and Halifax Steamship Co., Ltd., of Liverpool, N. S., and employed in the Newfoundland and New York trade, which occurred on Shag Rock, off Sambro Island, N. S., on Mar. 17.

The City of Sydney, which appears to have been well found and equipped in every respect, and with a crew of 46 all told, 13 passengers and a general cargo on board, sailed from New York on Mar. 14, at 1.30 p.m., for St. John's, Nfld., via Halifax. The draught leaving New York was 15¼ ft. forward and 19¼ aft. A departure was taken at 11.10 a.m. on Mar. 15 from abeam of Great Round Shoal buoy, Nantucket Sound, and a course E by N set by compass, with the intention of passing from 3 to 5 miles south of the Brazil Rock buoy, off Cape Sable, and the patent log was streamed and set. At 11 p.m., the vessel ran into dense fog, which appears to have been almost continuous until the time of the stranding, and at 6 a.m. on the 16th, soundings were commenced with patent sounding machine, and continued at varied intervals until shortly before the ship stranded. At 8.30 p.m. the course was altered to E by N ½ N, by compass, to make the Halifax light vessel, and with the assumption that Brazil Rock buoy was well to the north and westward. The vessel proceeded at full speed until 7 p.m., when the speed was reduced to slow, and the vessel proceeded on various courses trying to pick up the sounds of the submarine bell and whistle on the light vessel. The wind throughout the night and morning of the 16th and 17th, was about ESE, light breeze. About 3.20 a.m. on the 17th the sound of an explosive signal was heard, about two points on the port bow, the ship then heading NE by E, by compass, which appears to have been the fog signal on Sambro lighthouse, and a few minutes later the vessel struck on the Shag Rock, off Sambro Island, and ultimately became a total wreck. The passengers and crew were taken off by tugs and landed at Halifax the same day.

The court, after carefully reviewing the evidence adduced, which was apparently perfectly straightforward in every respect, is unanimous in its opinion that the stranding was caused by an error of judgment on the part of the master, inasmuch as he did not make sufficient allowance for a westerly set along the southern coast of Nova Scotia, the existence of which appears to be well known, thereby allowing his assumed position to be to the eastward and ahead of the actual one, a difference which the court is of opinion must have been at least 20 miles, judging by subsequent events. The court also is of opinion that the master was not justified in proceeding on his course after hearing the fog signal bomb on Sambro at about 3.20 a.m., for had he then stopped his engines, or hauled his ship to the southward, the casualty would probably have been avoided. The court therefore censures Daniel Michael MacDonald, the master, and cautions him as regards overconfidence as to his ship's position in the future. The court severely criticises what appears to be the common practice on the coast, of vessels proceeding at full speed in fog, which is in direct contravention of article 16 of the International Rules of the Road.

Welland Ship Canal Construction Tenders.

Canadian Railway and Marine World for May contained details of the contracts which have been awarded on the various sections of the Welland Ship Canal. Following is a list of the tenders sent in, the names of the successful tenderers being shown in capitals,—

Section 1.

M. P. & J. T. Davis	$5,394,780.00
Sir John Jackson (Canada), Ltd.	5,207,277.60
Quinlan and Robertson, Montreal	4,023,140.00
Soo Dredging & Construction Co.	5,970,505.00
Canadian Dredging Co.	3,870,075.00
DOMINION DREDGING CO.	3,487,725.00
Brown and Aylmer	5,213,850.00
Booth and Flinn	4,483,156.25
Anglo-Canadian Contractors, Ltd.	4,954,245.00
Baldry, Yerburgh and Hutchinson.	4,081,537.60

Section 2.

J. H. Corbett, Fredericton, N.B.	$5,418,075.00
Canadian Carter Co., Ottawa	6,557,125.00
Consolidated Construction Co.	6,595,542.50
Inland Construction Co., Toronto	5,687,487.50
A. C. Stewart & Co., Fort William.	9,680,010.00
BALDRY, YERBURGH & HUTCHINSON	5,377,185.75
Foley Bros., Welch, Stewart & Co.	6,163,260.00

Section 3.

Anglo-Canadian Contractors, Ltd., Toronto	$10,620,325.00
Booth and Flinn, New York	12,331,057.50
J. H. Corbett, Moncton, N.B.	10,220,665.00
Sir John Jackson (Canada), Ltd., Montreal	11,490,244.00
Carter Construction Co., New York.	11,402,075.00
Foley Bros., Welch, Stewart & Co.	11,103,290.00
O'BRIEN & DOHENY, Montreal	9,540,050.00
M. P. & J. T. Davis, Ottawa	10,066,955.60
Consolidated Construction Co., Toronto	10,647,590.00

Section 5.

Confederation Construction Co.	$2,506,462.00
Soo Dredging & Construction Co., Sault Ste. Marie, Ont.	2,304,362.00
Brown, Aylmer and Russell, Toronto	2,380,398.00
CANADIAN DREDGING CO., Midland, Ont.	1,945,788.00
Consolidated Construction Co.	2,475,745.00
J. H. Corbett	2,549,004.00
Inland Construction Co.	3,172,348.00
G. E. Fauquier, Ottawa; W. C. Chambers, Harriston, Ont.; C. McQuiggs, Nipigon, Ont., and W. A. McCaffrey, Toronto	2,618,610.00
Canadian Carter Co., Ottawa	3,010,285.00

Section 4a.

Jennings and Ross, Toronto	$ 97,138.00
Clarke and Monds, Toronto	175,386.50
McRae and Campaigne, Niagara Falls	302,744.00
Peninsular Construction Co., St. Catharines, Ont.	89,495.50
MAGUIRE & CAMERON, St. Catharines, Ont.	80,477.50
Lauzon Engineering Co., Levis, Que.	97,852.00
C. S. Boone Dredging & Construction Co., Toronto	99,648.00
J. K. Kernahan, St. Catharines, Ont.	108,258.00
F. R. Wilford, Lindsay, Ont.	116,917.00
Canadian Dredging Co.	98,764.00
Jones, Girouard and Co., Ottawa	102,386.00
Campbell & Lattimore, Toronto	146,295.40

The acting Minister of Railways and Canals in giving the foregoing information in the House of Commons recently, also stated that sections 4, 6, 7, 8 and 9 are still to be let. He continued, that he understood from the engineers that contracts for these sections, with the exception of section 8, will not take more than half the time of the others, and so there is no great urgency so far as they are concerned. Tenders for section 8 will be invited shortly, in order that the work may be finished about the same time as the other four contracts already awarded. The lock sills and gates for the canal are all being built to 30 ft. so that if in future it becomes necessary to make the canal that depth, all that will be necessary to do, will be the dredging.

Increased Subsidies for Dry Dock Construction.—The Minister of Public Works gave notice recently of a resolution to the effect that it is expedient to provide that the subsidy payable in respect of first class dry docks be increased from 3½ to 4% per annum of the cost of the work, for a period not exceeding 35 years.

The Transfer of Richelieu & Ontario Navigation Company's Property.

Following are extracts from a circular issued to shareholders.

As reported at the last annual meeting, the company has received from Canada Steamship Lines the consideration mentioned in the agreement for the purchase of the assets of R. and O. N. Co., as a going concern, the consideration being preference and ordinary shares of Canada Steamship Lines, Ltd., in the proportion of 6 preference and 2 ordinary shares of Canada Steamship Lines for 5 shares of R. and O. N. Co., and the exchange will be made as of June 1. Shareholders, therefore, are requested as far as possible to so arrange their holdings, either by purchase or sale, in such a way, that the number of shares of R. and O. N. Co., held by them shall be divisible by five, as the company cannot deal with fractional shares when the exchange is made.

In order that shareholders may fully understand what their position is with regard to dividend, the directors of R. and O. N. Co., have declared the regular quarterly dividend of 2% on the capital stock payable June 1 to shareholders of record May 20, at 3 p.m., for the quarter ending May 31. Shareholders are requested not to send in their stock certificates for exchange before May 20, as their names must be on the company's books on May 20 to rank for dividend.

Application has been made to the Montreal Stock Exchange and the Toronto Stock Exchange for the listing of the preference and ordinary shares of Canada Steamship Lines, Ltd., and for the withdrawal of the listing of R. and O. N. Co., so that on and after June 1 trading on these exchanges will be in the shares of Canada Steamship Lines, and not R. and O. N. Co.

The St. Pierre Miquelon—Renwick Collision.—In connection with this collision on Dec. 27, 1911, the owners of the former vessel appealed to the Judicial Committee of the Imperial Privy Council recently, against the judgment of the Supreme Court of Canada confirming the previous judgments of the Nova Scotia Courts and the Dominion Wreck Commissioner, whereby the St. Pierre Miquelon was alone held responsible for the collision and subsequent loss of the Renwick. In dismissing the appeal, Mar. 4, the Committee called attention to the settled rule that when it is sought to reverse the judgments of courts below, on the ground that the judges have taken an erroneous view of the facts, it is incumbent on the appellants to adduce the clearest proof that there is an error in the judgment appealed from, and so to speak, place a finger on the mistake. In the present case, the Committee was clearly of the opinion that the finding of the lower courts on the St. Pierre Miquelon's counterclaim cannot be disturbed.

Changes in Marine Positions.—Commander H. St. G. Lindsay, R.D., R.N.R., Dominion Wreck Commissioner, has been appointed chief of the pilots of Montreal and Quebec, with jurisdiction over the pilotage from Montreal to Father Point, and with office at Quebec. At the Wreck Commissioner's court at Montreal, May 5, members of the bar present tendered their congratulations on the appointment, and in reply, Commander Lindsay said that as no official announcement had been made regarding the positions of Wreck Commissioner and Chief of Pilotage Service, the time was not opportune for him to say anything on the matter.

Concrete Cribs for Pier Construction at Victoria, B.C.

A contract has been let by the Public Works Department for the construction of two piers at Victoria, B.C., which are to be followed by two more of similar size and design. The cost of the two now proposed will approximate $3,000,000. The piers will be 250 ft. wide, from 800 to 1,000 ft. long and spaced so as to allow a 300 ft. berthing slip between them.

In preparing the foundations the first work will be the dumping of large rock at the site, bringing the water to a uniform depth of 35 ft. The maximum natural depth is 65 ft. After sufficient rock has been dumped divers are to be employed to mark off the foundation and then assist in leveling a strip 35 ft. wide just inside the entire perimeters of the docks. This leveling will be done by dumping small rubble where required and having the divers pack up the surface. The central portion of the foundation area will be left in the rough.

While the foundation is being prepared reinforced concrete cribs, 100 by 35 ft. in plan, with 39 ft. walls, are to be built and launched. These cribs are to be strengthened by two longitudinal walls 11 ft. 8 in. on centres and transverse bulkheads 10 ft. apart and 10 in. thick. The floors and main walls of the cribs are to be 20 in. thick, and sea cocks are to be provided in the floors to admit water for sinking the cribs after they have been floated to the exact location desired over the 35 ft. strip which has been leveled off around the foundation border. These cribs are to weigh 3220 tons each, and are calculated to draw 29 ft. of water.

The cribs will be located end on entirely around the piers, 20 being required for pier 3, twenty two for pier 2, and three for the bulkhead between piers. All of these bulkheads will stand with their tops 4 ft. above low tide level. When the cribs have been sunk in place they are to be filled with rubble, which will then be levelled off to provide a uniform base for the superstructure. The superstructure is to be of concrete and will rise to a height of 12 ft. above the cribs for the full length of the piers. Finally, the area between the superstructural walls will be filled with hard-packed rubble.

It is estimated that 4,334 tons of reinforcing will be used in the cribs, which are to require 66,500 cu. yd. of concrete, while the superstructure will need 18,000 cu. yd. more. The total rock capacity of the cribs will be 161,000 cu. yd., while 1,094,000 cu. yd. more will be needed to fill in between the cribs and behind the bulkhead.

The plans and specifications of the docks have been prepared under the direction of the Chief Engineer of the Department of Public Works. J. S. MacLachlan, District Engineer for the Department, will supervise the construction.

The Abolition of the Quebec Corporation of Pilots.

The Minister of Marine has introduced a bill into the House of Commons, to amend part 6 of the Canada Shipping Act, relative to the Corporation of Pilots for and below the harbor of Quebec. The bill provides that the Minister shall have charge of the examination, licensing, control and management of the pilots and pilot apprentices, pilot schooners and other vessels for the pilotage district of Quebec, of all questions respecting pilotage arising in connection and of the collection of all pilotage dues, and all powers vested in the Corporation are to be transferred to and vested in the Minister. All the powers hitherto vested in the Corporation of Pilots are to be repealed, but the management and disposal of the pilot fund is not interfered with, it being exercised under the supervision of the Minister, as heretofore.

List of Steam Vessels Registered in Canada From Jan. 1 to Apr. 30, 1914.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.		Owner or Managing Owner
130227	Athabasca River	Winnipeg	Athabasca Landing, Alta.	1912	136 0	28 0	3 6	341	231	9	n.h.p. pa.	Hudson's Bay Co., London, Eng.
134076	B.C. Maid	Vancouver, B.C.	Seattle, Wash.	1893	65 0	14 7	5 7	80	26	8	" sc.	A. MacIsaac, Vancouver, B.C
84134	Bellona	Montreal	Dundee, Scotland	1881	340 0	40 2	26 8	2032	1864	320	" "	Reid-Donald Steamship Co., Montreal.
130280	City of St. Boniface	Winnipeg	Winnipeg	1913	100 0	30 0	4 0	314	163	13	" pa.	Lake Winnipeg Shipping Co., Winnipeg.
104606	Cruizer	Halifax, N.S.	Glasgow, Scotland	1895	150 0	24 5	13 0	380	24	112	" sc.	C., and C. G. Brister, I.O., Halifax, N.S.
134230	Edouard G.	Montreal	Sorel, Que.	1914	69 0	16 0	7 5	71	32	24	" "	Sincennes-McNaughton Line, Montreal.
134111	Fispa	New Westminster	New Westminster, B.C.	1913	74 0	14 0	7 5	63	25	12	" "	Minister of Marine, Ottawa, Ont.
126659	Glenfinnan	Midland, Ont.	Cleveland, Ohio	1893	324 0	42 0	19 5	2406	1472	195	" "	Great Lakes Transportation Co., Midland, Ont.
134251	Granite Rock	Winnipeg	Winnipeg	1913	110 0	22 7	10 2	214	99	42	" "	Lake Winnipeg Shipping Co., Winnipeg.
116572	J. T. Horne	Fort William, Ont.	Port Arthur, Ont.	1913	128 6	28 0	14 4	428	291	117	" "	W. O. Matthews, Port Arthur, Ont.
130887	John E. Monk.	Amherstburg, Ont.	Sandusky, Ohio	1887	72 0	16 5	7 5	58	40	10	" "	J. Fraser, Amherstburg, Ont.
134119	M. C. M.	New Westminster	New Westminster, B.C.	1914	69 3	17 3	6 9	73	46	16	" "	J. Mayers, New Westminster, B.C.
130279	McKenzie River	Winnipeg	Fort Smith, Alta.	1911	126 0	26 0	5 0	413	287	9	" pa.	Hudson's Bay Co., London, Eng.
126660	Minnekahta	Midland, Ont.	West Bay City, Mich.	1893	328 0	42 5	20 5	2759	1644	144	" sc.	Great Lakes Transportation Co., Midland, Ont.
130717	Northland Trader	Kenora, Ont.	Fort Smith, Alta.	1906	87 0	16 5	6 0	110	59	8	" "	Northern Trading Co., Edmonton, Alta.
130719	Notin	" "	Winnipeg	1913	48 0	10 0	9 2	18	13	4	" "	Ross Navigation Co., Pas, Man.
87034	Santa Maria	Vancouver, B.C.	Govan, Scotland	1883	154 0	22 0	12 4	235	124	80	" "	W. H. M. Townsend, London, Eng.
88739	Sindbad	Montreal	Scotswood, Eng.	1883	216 2	31 2	13 5	897	539	99	" "	F. E. Hall, Montreal.
133939	Sir John	Ottawa	Sorel, Que.	1902	81 2	17 3	8 0	94	41	8	" "	Minister of Public Works, Ottawa.
130276	Slave River	Winnipeg	Athabasca Landing	1912	109 0	22 3	5 0	318	205	5	" pa.	Hudson's Bay Co., London, Eng.
133940	Trudeau	Ottawa, Ont.	Lockport, N.Y.		75 5	17 0	8 0	81	55	8	" sc.	Minister of Public Works, Ottawa.

List of Sailing Vessels and Barges Registered in Canada From Jan. 1 to Apr. 30, 1914.

No.	Name	Port of Registry	Rig	When and Where Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
134212	Albert Meyer	Prince Rupert, B.C.	Schr.	1896	Fairhaven, Cal.	156 0	36 0	11 9	398	Atlin Construction Co., Toronto.
134046	Allison H. Maxner	Lunenberg	Schr.—Glt.	1913	Lunenburg, N.S.	104 2	25 8	10 5	92	E. Maxner, M.O., Lunenburg, N.S.
134047	Aranoka	Lunenburg	Schr—Glt.	1914	Mahone Bay, N.S.	97 6	25 0	10 0	94	R. Hiltz., M.O., Indian Point, N.S.
134118	Atagi No. 1	New Westminster, B.C.	Barge	1913	Steveston, B.C.	50 0	16 0	4 0	28	Atagi, Steveston, B.C.
134120	B. C. T. No. 2	" " "	"	1912	New Westminster	79 6	29 0	7 0	147	B.C. Transport Co., London, Eng.
134121	B. C. T. No. 6	" " "	"	1912	" "	79 6	29 0	7 0	147	" " "
134172	Cecil L. Shave	Shelburne, N.S.	Schr.	1914	Shelburne, N.S.	96 0	23 0	9 6	98	T. Shave, Burin, Nfld.
134081	Coquitlam City	New Westminster, B.C.	"	1914	Pt. Coquitlam, B.C.	196 0	41 0	13 0	922	Coquitlam Shipbuilding and Marine Ry. Co., Port Coquitlam, B.C.
134237	Don R.	Montreal	Scow—Chd.	1914	Montreal, Que.	120 2	28 1	8 5	225	Quinlan & Robertson, Montreal.
134122	E. E. H. II.	New Westminster, B.C.	Barge	1913	New Westminster	117 8	39 8	9 2	375	E. E. Higgins, Eburne, B.C.
134123	E. E. H. III.	" " "	"	1913	" "	117 8	39 8	9 2	375	" " "
134234	Edward Q.	Montreal	Scow—Chd.	1913	Montreal, Que.	99 7	28 4	6 6	145	General Contracting Co., Montreal.
134240	Frank Q.	Montreal	Scow—Chd.	1911	Montreal, Que.	110 3	28 2	7 2	174	" " "
130766	Harriett D.	Kingston	Barge--Chd	1885	Mount Clemens, N.Y., U.S.A.	163 9	32 2	11 4	460	J. Donnelly, Kingston, Ont.
134045	J. Henry Mackenzie	Lunenburg	Schr—Glt.	1914	Lunenburg, N.S.	109 8	26 3	10 4	100	W. C. Smith, M.O., Lunenburg, N.S.
134238	Leo B.	Montreal	Scow--Chd.	1911	Montreal, Que.	110 8	28 1	8 2	199	General Contracting Co., Montreal.
133672	Lottie R. Russell	Halifax, N.S.		1895	Leesburg, N.J.	122 8	32 6	10 4	282	C. Brister, Halifax, N.S.
133942	Naden	Ottawa	Schr—Glt.	1913	Vancouver, B.C.	80 0	20 1	8 6	88	Minister of Naval Service, Ottawa.
134341	Nap. L	Montreal	Scow—Chd.	1911	Montreal, Que.	110 3	28 2	7 2	174	General Contracting Co., Montreal.
133943	Norman F. Wilson	Ottawa	Barge--Chd.	1914	Hull, Que.	113 0	24 2	7 8	179	Ottawa Transportation Co., Ottawa, Ont.
133941	P. W. D. No. 114	Ottawa	Dredge	1877 1911	Lockport, N.Y. Wallaceburg, Ont.	72 7	25 0	6 5	103	Minister of Public Works, Ottawa.
133938	P. W. D. No. 120	"	"	1899	Ottawa, Ont.	79 0	28 0	6 8	217	" " "
134233	Q. & R. No. 1	Montreal	Dredge—Drague	1914	Montreal, Que.	110 1	35 1	6 8	431	Quinlan & Robertson, Montreal.
134226	R. Charland	Montreal	Barge--Chd.	1909	Sorel, Que.	108 4	23 4	7 3	126	R. Charland, Montreal
134112	R. F. No. 5	New Westminster, B.C.	Barge	1913	New Westminster	86 0	30 0	8 1	84	R. Fenton, New Westminster, B.C.
134036	Transfer No. 5	Victoria, B.C.		1913	Nelson, B.C.	224 1	42 5	7 9	681	Canadian Pacific Ry. Co., Montreal.
97098	Urania	Sydney, N.S.	Schr.	1891	Lunenburg, N.S.	85 9	24 5	8 8	100	W. C. Trenholm, Louisburg, N.S.

Canadian Vessels Statistics for 1913.

The total number of vessels on the Dominion register at Dec. 31, 1913, was 8,545, measuring 896,965 tons, an increase of 155 vessels and 60,687 tons, over 1912. Of this number, 3,847 were steam vessels, with a gross tonnage of 711,512, which, at an assumed average value of $30 a ton, brings the value of the net registered tonnage to $26,908,950. The number of new vessels built and registered in the Dominion during 1913, was 344, of 40,164 tons register, which at an estimated value of $45 a ton, gives a total value of $1,807,380. During the year 291 vessels were removed from the register for various causes. It is estimated that 43,968 persons were employed on vessels registered in the Dominion, during the year.

The number and tonnage of vessels according to provinces, are as follows:—

	Sailing ships and steamships.	Steamships.	Gross tonnage of steamships.	Net tonnage of sailing ships and steamships.
Ontario..	2,012	1,451	308,543	279,641
Quebec..	1,628	557	165,161	247,225
British Columbia.	1,506	1,090	135,795	153,060
Nova Scotia	2,106	383	45,130	138,107
New Brunswick..	1,031	241	41,424	60,020
Prince Edward Is.	149	24	4,602	10,071
Manitoba	95	84	7,094	5,545
Yukon	15	13	3,377	2,940
Saskatchewan ...	5	4	386	355
Totals	8,545	3,847	711,512	896,965

Ports of registry are distributed as follows, according to provinces,—Ontario 38, Nova Scotia 21, New Brunswick 7, Quebec 6, British Columbia 4, and Manitoba, Saskatchewan and Yukon, 1 each.

The new vessels built and added to the register during the year, according to provinces, were as follows:—

	Vessels.	Net Tonnage.
Ontario	38	15,572
British Columbia...	128	9,090
Quebec	62	8,667
Nova Scotia	67	4,899
New Brunswick...	45	1,114
Prince Edward Island.. ...	3	804
Manitoba..	1	18
Totals	344	40,164

Of the 291 vessels removed from the register during the year, 132 were broken up, reported out of existence, condemned, dismantled and abandoned; 37 were wrecked; wy were burnt; 20 were sold to foreigners; 15 were transferred to Newfoundland; 12 were lost; 12 were transferred to Barbadoes; 11 were stranded; 5 were removed as the registry was no longer required; 3 were reported missing; 2 were abandoned at sea, and 1 each were lost in collision, and transferred to British West Indies.

In a list showing the tonnage of the various maritime countries of the world, Great Britain, including its dominions and colonies (with Canada) stands first, with 11,886,300 total net tonnage, more than the combined tonnage of the next six countries. Canada takes ninth place in the list.

The Sault Ste. Marie and the Suez Canals Compared.—The United States Secretary of Commerce drew attention recently to the fact that the number of ships passing through the river and canal connecting Lake Huron and Lake Superior amounted last year to nearly three times the number that passed through the Suez Canal. To be exact, 14,916 vessels of 30,974,123 tons passed through the Sault Ste. Marie Canal, while 5,300 vessels of 20,275,133 tons passed through the Suez.

The Development of North Fraser Harbor, B.C.

The North Fraser Harbor Commissioners were incorporated in 1913, by the Dominion Parliament, to control the North Fraser harbor, the limits of which are as follows,—From a line drawn across the north arm of the Fraser River in continuation southerly of the western boundary of New Westminster, thence down stream to the north arm on both sides to the average high water mark, to lines drawn across the outlets of the north arm into the Gulf of Georgia, but not extending farther southerly than a point equidistant between the most northerly and the most southerly points of the western shore of Lulu Island, nor extending farther northerly than Point Grey; including the adjacent waters of the Gulf of Georgia on Sturgeon Bank as far seaward as may be determined from time to time. The north arm leaves the main channel of the Fraser River at New Westminster, and forms the southern boundary of the peninsula bounding the south of Burrard Inlet, passing Burnaby, South Vancouver and Point Grey districts, on the north. The Richmond district is well adapted for the location of the larger class of industries, with a present population of about 7,000. The approximate population of the other districts is, Burnaby 15,000; South Vancouver 35,000 and Point Grey 15,000. The latter municipalities are in reality a part of Greater Vancouver, having all city facilities, but are preserving their municipal individuality, for development purposes.

The Harbor Commissioners have adopted a scheme for the development of a deep sea harbor in the north arm, and consider that the location is ideal, as it is claimed that a perfectly safe entrance can be made at any time of the day or night, unaffected by the state of the tide or fog conditions. The river has an average width of 1,000 ft., and the adjacent lands are very suitable for basin and dock development at comparatively low cost. The absence of silting is also in its favor, in fact it is stated that although the water has not been interfered with since the removal of snags about 30 years ago, there has not been an inch of silting in that time.

As a preliminary for the larger work, the Dominion Government awarded a contract, Apr. 19, for dredging the north arm and for the construction of a jetty, from the westerly end of Iona Island, at the outlet of the north branch of the north arm, towards deep water, for four miles, to protect the channel from sand, and at the same time to allow of dredging being carried out. The work immediately outlined will cost over $1,000,000, the contract recently awarded approximating $800,000.

The whole work is in charge of R. F. Leslie, M. I. C. E., M. Can. Soc. C. E., who has had considerable experience as a railway and harbor engineer, and W. M. Davis, M. Can. Soc. C. E., who has had a large experience as a consulting engineer in eastern Canada. The commissioners, two of whom are appointed by the Governor-in-council, and one elected by the four municipalities concerned, are R. Abernethy, Port Moody, and F. Trites and R. C. Hodgson, Vancouver.

The Donaldson Line s.s. Saturnia, which touched bottom in the St. Lawrence River, in the Lower Traverse, Apr. 28, cleared from the dry dock at Maisonneuve, May 5, after the comparatively slight repairs were carried out. She at once took on cargo and sailed for Glasgow, May 6.

Government Chartered Steamships for Hudson Bay Service.

The Minister of Railways gave the following informaton recently, as to steamships chartered by the Dominion Government for service in connection with the building of the Hudson Bay railway terminals at Port Nelson:

Cearense, 1,790 tons net register; owner, J. F. O'Meara, New York; cost, $20 per m. ft. b.m. for lumber, and $10 a gross ton for coal;

Alcazar, 2,020 tons net register; owner, Inter-American Steamship Co., Toronto; cost, $25 per m.ft. b.m. for lumber, and $15 a gross ton for coal;

Bonaventure, 467 tons net register; owner, Bonaventure Steamship Co., St. John's, Nfld.; cost, $5,500 a month;

Bellaventure, 467 tons net register; owner, Bellaventure Steamship Co., St. John's, Nfld.; cost, $5,500 a month;

Sindbad, 539 tons net register; owner, F. E. Hall, Montreal; cost, $4,500 a month;

Alette, 1,937 tons net register; owner, Timber Transport Ltd., O. W. Mordin, Managing Director; cost $25 per m.ft. b.m. for lumber.

The Cearense carried a cargo chiefly of coal from North Sydney, and lumber from Halifax; the Alcazar, lumber from Port Arthur, Texas; the Bonaventure and Bellaventure, general cargo and men; the Sindbad, general cargo; the Alette, lumber from Port Arthur, Texas, and lumber and two steel sectional scows from Halifax. The Bonaventure and Bellaventure each made a second trip, the first named with general cargo and men, and the second, with coal from North Sydney, and for towing the dredge Port Nelson. The s.s. Beothic was chartered by the Naval Department for a general cargo and men.

The motor schooner Neophyte was purchased from the Navigation Syndicate, of Nordin, N.B., for £4,000. She is of steel construction throughout, built to German Lloyd requirements in 1910. She is 96.72 net registered tons, and has a capacity of 188 tons on a 7 ft. draught. From her arrival at Port Nelson, Aug. 14, 1913, until the departure of the last steamer out, Oct. 13, she made 43 round trips with cargo, from the ship's anchorage to temporary wharf at Root Creek.

With regard to the steam dredge Port Nelson, a full description of which has appeared in Canadian Railway and Marine World, the Minister stated that it was built by Polson Iron Works, Toronto, and cost $272,184.02, which included spare parts and some special towing equipment. The vessels which towed the dredge to Port Nelson also carried coal, of which 206 tons were unloaded at Port Nelson, also some supplies utilized in towing, such as timber in bulkheads, cables, etc., were purchased with a view to their subsequent use in connection with the terminal work, and left at Port Nelson. The hull of a stern wheel tug and some plant were loaded on the dredge, thus saving the freight charges otherwise necessitated by their transportation. It is estimated that the cost of towing the dredge from Montreal to Port Nelson and placing her in winter quarters was $29,457.79.

The Bermuda Atlantic Steamship Co., Toronto, has sold its s.s. Oceana to United States interests. She was built at Dumbarton, Scotland, in 1891, and was formerly called Scot. She is screw driven, with engines of 1,254 n.h.p. Her dimensions are: length 531 ft., breadth 54.8 ft., depth 17.9 ft., tonnage 7,815 gross, 4,278 register.

The Board of Railway Commissioners and Lake Freight Rates.

Among the amendments to the Railway Act which are being considered by the Railway Committee of the House of Commons, is one which places the control of freight rates on all inland vessels under the jurisdiction of the Board of Railway Commissioners. A deputation of vessel owners waited on the Committee, May 19, to oppose the amendment to the clause which at present applies only to railway owned vessels operating on inland waters. The deputation included L. L. Henderson, General Manager, Montreal Transportation Co., and President, Dominion Marine Association; A. A. Wright, General Manager, St. Lawrence and Chicago Steam Navigation Co.; H. W. Richardson, Great Lakes Transportation Co.; C. B. Harris, Canada Steamship Lines; and D. Murphy, Ottawa Transportation Co.

The deputation pointed out that flexibility of rates is absolutely essential, and it would be a great mistake to restrict them in any way. It is not the vessel owners who make the rates, but the shippers. Vessels are now carrying grain at 4½c. a bushel, whereas they were getting 7c. last autumn, and the rates generally fluctuate according to the law of supply and demand. It was suggested that the amended clause would work to the advantage of rail and lake lines, which were assured of a steady traffic, but would act as a detriment to the general steamboat interests. It would also result in putting out of business the small owners and concentrating the business in a few hands, and would mean a general raising of rates. It was also declared that the restriction would tend to the diversion of a great deal of Canadian borne traffic to the U.S. routes. On the question of the diversion of Canadian traffic to Buffalo, Mr. Henderson stated that Canadian vessels are at present getting all the traffic which Montreal can handle, and Buffalo is only getting the surplus.

H. W. Richardson spoke of the great need of constantly improving the terminal facilities at Canadian ports. U.S. vessels have the advantage in the summer months of ore cargoes down and coal cargoes up, while Canadian vessels often have to go light. He contended that the opening of the Erie Canal in 1916 would tend to make a low rate between Buffalo and New York, but possibly the new Welland canal might offset this.

At the time of going to press, May 29, it is reported that the C. P. R. s.s. Empress of Ireland, outbound to Liverpool, Eng., had collided with the Norddeutscher Lloyd s.s. Hanover, about 30 miles east of Father Point and had sunk immediately.

Atlantic and Pacific Ocean Marine.

The St. Lawrence navigation season opened Apr. 29, 10 days later than in 1913, and 6 days later than in 1912.

The C.P.R. s.s. Ruthenia is being drydocked at Liverpool, Eng., for a general overhaul.

Capt. R. G. Kendall, of the C.P.R. s.s. Ruthenia, is reported to have been appointed to the company's s.s. Empress of Britain.

The C.P.R. s.s. Empress of Asia, which arrived at Vancouver, May 3, made a record of 9 days and 3 hours, beating by 2 hours the previous record, which was held by her sister vessel, the Empress of Russia.

The Russian Government presented, at Yokohama, Japan, recently, a large oil reproduction of a portrait of the Empress Catherine of Russia to the C.P.R. s.s. Empress of Russia. It has been hung in the ladies' saloon.

The Allan Line s.s Corsican was the first ocean vessel to arrive in Montreal harbor for the current navigation season. Capt. Hall was presented with a gold-headed cane by the harbor master, on behalf of the Harbor Commissioners.

The Shipping Federation is making representations to the Dominion Government regarding the building of a block pier at the Lower Traverse, in the St. Lawrence River, to replace the lightship stationed there. It is stated that the lightship is frequently off her station.

The Donaldson Line s.s Saturnia, while proceeding up the St. Lawrence to Montreal, Apr. 28, touched bottom in the Lower Traverse. The damage was comparatively slight. It is stated that the cause of the accident was the absence of two buoys and a light ship, which should have marked the angle of the Lower Traverse below Quebec.

A press report from Vienna, Austria, May 6, states that the U.S. Ambassador there has protested against the continued delay in the trial of Samuel Altman, ex-General Agent, C.P.R.., on charges of breaches of the emigration laws. The case has been pending since Oct. 1, 1913. Granted that the dispatch is correct, one is inclined to ask, what is the U.S. Ambassador's locus standi?

On account of the addition of the steamships Alsatian and Calgarian to the Allan Line service, a number of changes of captains has taken place. Following are the captains of the various Allan vessels on the St. Lawrence route this season:—Alsatian, E. Outram; Calgarian, J. T. Gambell, Corinthian, R. G. Gamber; Corsican, J. Hall; Grampian, J. Williams; Hesperian, W. S. Main; Ionian, B. T. Eastaway; Scandinavian, J. M. Reith; Scotian, B. Henry; Sicilian, J. Peters; Tunisian, G. Hamilton; Victorian, E. Cook; Virginian, E. Rennie.

The Reid-Donald Steamship Co., of Montreal, which recently purchased the s.s. Bellona, has had her thoroughly overhauled and repaired and placed on the Canadian register. She was formerly owned by the Thomson Line, and on Oct. 31, 1912, while en route from Montreal to Aberdeen, Scotland, with a cargo of general produce, grounded in the upper traverse of the St. Lawrence River. She was built at Dundee, Scotland, in 1881, her dimensions being: length 340 ft., breadth 40.2 ft., depth 26.8 ft., tonnage 2,932 gross, 1,864 register, and she is equipped with engine of 320 n.h.p. driving a screw.

Principello Steamships, Ltd., has been incorporated under the Dominion Companies Act, with $150,000 capital and office at Toronto, to own and operate steam and other vessels of all kinds, and to carry on business throughout the Dominion, and elsewhere. The incorporators are:—Gerard Ruel, S. C. Snively, A. J. Reid, K.C., W. B. Fleming and G. N. Limpricht, Toronto, all of whom are connected with or employed by Mackenzie, Mann and Co., Ltd.

Maritime Provinces and Newfoundland.

The Nova Scotia Registrar of Joint Stock Companies has revoked the certificate of registration of the Minas Basin Steamship Co., Ltd., on account of nonpayment of the annual fees.

Supplementary letters patent have been issued under the Dominion Companies Act, changing the name of the Campbellton and Gaspe Steamship Co., Ltd., to the Gaspe and Baie des Chaleurs Steamship Co., Ltd.

The Royal Mail Steam Packet Co.'s s. s. Chaudiere arrived at St. John, N. B., May 9, from Southampton, Eng. She has been placed in service between Canada and the West Indies, in place of the wrecked s. s. Cobequid.

It is reported that the New York, Newfoundland and Halifax Steamship Co. is negotiating for the purchase of a steamship, in England, to replace the s.s. City of Sydney, which was wrecked near Halifax, recently.

The Royal Mail Steam Packet Co. has presented, through the Mayor of Yarmouth, N. S., a piece of silver plate, suitably engraved, to each of the captains of Hugh Cann and Sons' steamships John L. Cann and Westport III, A. L. McKinnon and J. E. McKinnon, brothers, for their services in rescuing passengers from the wrecked s. s. Cobequid, last January.

The Newfoundland sealing season, which recently closed, is regarded as a great financial success, the net result being $498,086.02. In other respects it has perhaps been the most disastrous in the history of the industry, owing to the loss of the steamers Newfoundland and Southern Cross, with 252 lives, almost at the close of the season.

In consequence of the construction of the works in connection with the car ferry terminals at Cape Tormentine, N.B., the period during which it was announced by order in council, Sept. 24, 1913, that the public wharf or pier there would be closed to public navigation, viz,—the remainder of the 1913 season, and for two months from the opening of the current season, has been extended to cover the entire navigation season of 1914.

Province of Quebec Marine.

The Dominion Government s. s. Lady Grey has been drydocked at Maisonneuve, Montreal, for a general overhaul and repairs.

Canada Steamship Lines' s. s. Murray Bay has completed her repairs at the dry dock, at Maisonneuve, Montreal, and has returned to service.

The Department of Marine recently received tenders for the supply of a crane, service boat and other equipment for use in Quebec harbor.

A new lighthouse has just been completed on St. Laurent wharf, and it was expected to be in operation June 1. This light replaces the fixed white light heretofore shown from a lantern on the freight shed.

Canada Steamship Lines, Ltd., has appointed the following captains of its vessels, in addition to those published in previous issues,—Rapids King, S. Putnam; St. Irenee, Z. La France; Saronic, W. S. Kennedy.

The Montreal Harbor Commissioners are completing the construction of small and light draught steam tug for harbor work.

Capt. J. E. Murray, of the C. P. R. s. s. Empress of Ireland, is reported to have been appointed harbor master at Quebec, at a salary of $4,000 a year.

The Montreal Board of Control has engaged the services of an expert to advise them as to what would be required in the way of new vessels, wharf and dock accommodation, should it be considered advisable to take over the ferry service to St. Helens Island, after 1915.

The steam tugs Musquash and Gopher, owned by the C. P. R., through the Mersey Towing Co., and utilized in attending to the C. P. R. vessels at Liverpool, Eng., are being transferred to Quebec for use there. They are screw tugs, built of steel in 1910, classed

100 A1 at Lloyd's, and are of the following dimensions, length 100 ft. 2 ins., breadth 23 ft. 1 in., depth 12ft.

Capt. L. A. Demers, harbor master, Montreal, is reported to have resigned, May 20, and to have stated that at his own request he will be appointed Wreck Commissioner, succeeding Commander H. St. G. Lindsay, the resignation of the position of harbor master being conditional on the other appointment. Press reports state that Capt. Bourassa will be appointed harbor master, vice Capt. Demers.

Montreal Vessel Agency, Ltd., has been incorporated under the Quebec Companies Act, with $5,000 capital and office at Montreal, to contract for the loading and unloading of vessels and carry on a general stevedoring business, and to act as brokers for the buying, selling and chartering of vessels, insurance on vessels and cargoes, etc. The incorporators are, C. M. Cotton, F. T. Enright, A. G. F. Ross, H. Woodcock and E. W. Westover, Montreal.

Ontario and the Great Lakes.

The Farrar Transportation Co. has removed its head office from Collingwood, Ont., to 107 Mail Bldg., Toronto.

The Marine Department has placed a gas buoy near the wrecked steamboat City of London, northwestward of the lighthouse in Pelee Passage, Lake Erie.

The Lake Coast Trading Co., Fort William, is reported to be securing estimates for the building of a dock at Silver Islet, a summer resort in the neighborhood.

H. C. Chappell, an inspector on the Northern Navigation Co.'s s.s. Huronic, died on board the vessel at Fort William, May 3, from a wound believed to be self inflicted.

A wrecking party left Sarnia recently to undertake the salvage of the s.s. Turret Chief, which ran on the rocks in Copper Harbor, Lake Superior, during last November's storm.

Dredging operations were recommenced in the Kaministikwia, McKellar and Mission Rivers, at Fort William, five dredges being engaged, and it is expected that three additional ones will be placed on the work early in June.

We are officially advised that there is no truth whatever in the press reports that Canadian Vickers, Ltd., are about to take over the Kingston Shipbuilding Co., and to establish a branch shipbuilding yard at Fort William.

The Lake Superior Dry Dock and Shipbuilding Co. has been granted an extension of time, to June 30, for the commencement of construction of the projected dry dock, etc., at Sault Ste. Marie. The time fixed by the agreement was May 15, and a deposit was made in a local bank as a guarantee of good faith.

The Northern Navigation Co.'s s. s. Noronic is announced to sail from Sarnia, June 3, on her maiden trip to Fort William. She was built at Port Arthur, last year, and came down to Sarnia before the close of navigation, for furnishing and finishing touches. Montreal papers state that she was built at Collingwood, which is incorrect.

The Reid Wrecking Co., Sarnia, which bought, and salved the wrecked s. s. I. W. Nicholas, formerly owned by the Nicholas Transportation Co., Cleveland, Ohio, has completely overhauled her, and reduced her to Welland Canal size. She was one of the vessels which ran ashore during the Great Lakes storm of last November.

A bylaw is being prepared at Owen Sound, for submission to the ratepayers, June 6, to grant $10,000 a year for 20 years for the construction of a dry dock and shipbuilding plant, to cost about $1,500,000, and which will give employment to not less than 200 men for at least 11 months of each year.

The s. s. Sindbad, owned by F. E. Hall and Co., Montreal, which has been maintained on the British register for some time, has been transferred to the Canadian register. She was built at Scotswood, Eng., in 1883, and is screw driven by engine of 99 n. h. p. Her dimensions are length, 216.2 ft., breadth 31.2 ft., depth 13.5 ft.; tonnage, 897 gross, 539 register.

The Port Colborne Tug Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital and offices at Port Colborne, to own and operate steam tugs, barges and other vessels, and to carry on a general towing and wrecking business. The incorporators are, T., and A. Lannan, Port Colborne; J. D., J. H. and T. E. McGrath, Port Dalhousie.

Polson Dry Dock and Shipbuilding Co., Ltd., has been incorporated under the Dominion Companies Act, with $2,000,000 capital and office at Toronto, to carry on the business of engineers, dredgers, contractors for the construction of public and private works, ship owners, etc., and to build, own and operate all classes of vessels, dry docks, harbors, wharves, etc.

For the protection of small local tugs, etc., a basin has been dredged to 10 ft. below standard low water, or to smooth limestone rock in the dock, between the Government wharf at Hilton, and the lumber wharf immediately east of it, for an area of about 180 sq. ft. A channel has also been dredged in to the mouth of the Walker River, in the St. Joseph channel, about 40 ft. wide and 6 ft. below standard low water.

The Northern Navigation Co., and the G.T.R., united in inviting a number of transportation men and press representatives, for a short trip on the s.s. Noronic, on her maiden voyage, at the end of May. The main members of the party left Montreal, May 29, and embarked at Sarnia, May 30, going by water to etroit, Cleveland and Windsor, where they took the train for Montreal, arriving there, June 1.

Great Manitou Park Co., Ltd., has been incorporated under the Ontario Companies Act, to acquire Grand Manitou Island in Lake Nipissing, and carry on a general hotel business there, and in connection therewith, to own and operate steam and other vessels. G. Gordon, H. W. Angus, J. T. Lindsay, J. McClusky and F. A. York, North Bay, are the provisional directors.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater, for April, as follows: Superior 601.83; Michigan and Huron 580.06; Erie 572.10; Ontario 246.75. As compared with the average April levels for the past ten years, Superior was 0.16 ft. above; Michigan and Huron 0.39 ft. below; Erie 0.42 ft. below, and Ontario 0.25 ft. above. It was anticipated that during May, Superior, Michigan and Huron, and Erie would rise about 0.3 ft., and Ontario 0.5 ft.

Buoys have been established by the Marine Department in Whitby harbor and at its entrance, marking the channel which was dredged by the Public Works Department, during 1913. The dredged portion lies between the east and west piers, where there is a depth of 16 ft., for a width of 120 ft., running northward for 600 ft. from the outward end of the angle of the west pier, and also southward for 600 ft. from the outer end of the west pier, 140 ft. wide and 16 ft. deep.

The Great Lakes Transportation Co., the incorporation of which was mentioned with detail in our last issue, has transferred three of the vessels it recently acquired in the United States, to the Canadian register. The steamships Minnetonka and Minnekahta, which were purchased from the Chicago and Duluth Transportation Co., have been transferred as Glenfinnan and Minnekahta, respectively, and the Wawatam, purchased from the Pittsburgh Steamship Co., has had her name changed to Glenlivet. Since the transfer, the name of the Minnekahta has been changed to Glenlyon. The port of registry in each case is Midland.

At the International Conference on City Planning, at Toronto, May 25 to 27, R. S. Gourlay, the city's Board of Trade representative on the Toronto Harbor Commission, gave an address on water front development. Special emphasis was laid on the various works now in progress along the water front, involving the filling in of Ashbridge's Bay and the establishment of a model industrial district there, first class railway and lake transport facilities, the

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during April.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons		874	874
Grain	"	Bushels	2,971,913	2,285,161	5,257,074
Building stone	"	Short tons			
Flour	"	Barrels	40,180	174,170	214,350
Iron ore	"	Short tons	21,063	8,960	30,023
Pig iron	"	"			
Lumber	"	M. ft b.m.	1,340	522	1,862
Silver ore	"	Short tons			
Wheat	"	Bushels	7,532,526	584,500	8,147,026
General merchandise	"	Short tons	3,080	1,174	4,254
Passengers	"	Number	10	2	12
Coal, hard	Westbound	Short tons	15,314	23,930	39,244
Coal, soft	"	"	92,307	196,269	288,575
Flour	"	Barrels			
Grain	"	Bushels			
Manufactured iron	"	Short tons	2,800	11,754	14,554
Iron ore	"	"			
Salt	"	Barrels	4,025	32,199	36,224
General merchandise	"	Short tons	7,318	13,420	20,738
Passengers	"	Number	41	18	59
Summary.					
Vessel passages		Number	175	188	363
Registered tonnage		Net	323,968	267,570	591,538
Freight—Eastbound		Short tons	318,868	87,136	406,003
" —Westbound		"	118,314	250,203	368,517
Total freight		"	437,182	337,338	774,520

deepening of the inner harbor, new docks, a 12 ft. driveway along the front, etc. The complete works, estimated to cost about $19,000,000, will be spread over the next six years.

Canada Steamship Lines s. s. W. Grant Morden, which was launched at Port Arthur, recently, underwent steam trials, May 7, when a speed of 14 miles an hour was attained, without the limits of her machinery being reached. She left the head of the lakes, May 11, with her first cargo of grain, for Port Colborne. In mentioning the matter, the Toronto Globe stated that the vessel was built for the Norcross interests to replace the James Carruthers, lost in the storm on the lakes last November. The s. s. W. Grant Morden was built for Canada Steamship Lines, Ltd., of which company, J. W. Norcross is Managing Director. The s. s. James Carruthers was owned by the St. Lawrence and Chicago Steam Navigation Co., with which Mr. Norcross has no connection whatever.

The first lock gate accident of the season occurred in the Welland Canal, Apr. 30, when F. E. Hall and Co.'s s.s. Compton, bound for Ashtabula, Ohio, entered lock 4 at what was considered too great a speed, and forced open the head gates. These returned unevenly, and the pressure of water from the higher level tore them from their fastenings, and swept them with the vessel and one of the lower gates, out to the lower level. Apart from the damage to the gates, the loss was light. The s.s. John Duncan, owned by Canada Cement Transport, Ltd., while passing through the canal, May 4, rammed the gates of lock 5 and also of lock 10, but as each of these gates are equipped with a safety device, which was described and illustrated in Canadian Railway and Marine World for August, 1912, any damage was averted. This device has been installed on the gates in several of the locks, and it is said that in the near future, all the lock gates will be so equipped.

Manitoba, Saskatchewan and Alberta.

The Ross Navigation Co.'s steamboat Minasin struck a sandbar in the Pas River, May 5, and partially capsized.

The assembling of the parts of the Dominion Government dredge at Pas, Man., to which some reference has already been made, was completed early in May, and she was placed in operation.

The Ross Navigation Co.'s steamboat Notin, which has been placed in local service at Pas, Man., was built at Winnipeg in 1913. She is screw driven by engine of 4 n.h.p. Her dimensions are: length 48 ft., breadth 10 ft., depth 9.2 ft.; tonnage, 18 gross, 13 register.

The s.s City of Edmonton, owned in Strathcona, Alta., has been thoroughly overhauled and repaired, and was ready for service at the end of May. She is a paddle wheel vessel with engine of 9 n.h.p. Her dimensions are: length 132 ft., breadth 28.8 ft., depth 4 ft., draught about 20 ins.

The Peace River Transportation Co. is building a passenger vessel for service between Sawridge and Grouard, on Lesser Slave Lake, connecting with the Edmonton, Dunvegan and British Columbia Ry. trains running between Edmonton and Sawridge, and also with a motor bus line to be run from Grouard to Peace River Landing. The whole trip from Edmonton to Peace River Landing will be accomplished in about 1½ days. The vessel will be about 60 ft. long, 11 ft. beam, and under normal conditions will draw about 2 ft. of water. It will be equipped with two 50 h.p. gasoline engines, and the hull will be divided into five water tight compartments. It will be lighted throughout by electricity, and will have a powerful searchlight. There will be accommodation for about 100 passengers and 17 tons of freight.

The Saskatchewan Steamship and Coal Co., which has arranged to operate steamboats on the Saskatchewan River, between Prince Albert, North Battleford and Edmonton, as reported in our last issue, has a capital of $1,500,000, and office at Minneapolis, Minn. The capital is said to be all provided for, and it is intended to establish branch offices at Pas, Man., Prince Albert and North Battleford, Sask., and Edmonton, Alta. Two light draught steamboats are being built at Prince Albert, the machinery being supplied from Chicago. The approximate dimensions of the vessels are,—passenger vessel, length 210 ft., beam 45 ft.; tow boat, length 150 ft., beam 35 ft. The officers are: President, E. J. Newell; First Vice President, J. A. Burrichter; Second Vice President, J. Segerstrom; Traffic Manager, R. F. Tompkins; Secretary-Treasurer, C. A. O'Leary.

British Columbia and Pacific Coast Marine.

The C.P.R. steam tug Naramata, built for towing barges on Lake Okanagan, was launched at Okanagan Landing recently.

West Vancouver's ferry steamboat, No. 5, which underwent trial trips at the end of April, was placed in service, on a half hour schedule, May 1.

A number of the U.S. coast steamship companies trading to Alaskan waters have petitioned the U.S. Congress for a resurvey of the inland passage to southeastern Alaska.

The Border Line Transportation Co., which runs a steamboat line between Tacoma, Seattle, Victoria and Vancouver, has added Nanaimo as a port of call. The steamboats Dispatch and Fulton are engaged in the service.

Greer, Coyle & Co. are reported to have purchased the steam tug Czar from the C.P.R. She was built at Victoria in 1897, and is screw driven by engine of 56 n.h.p. Her dimensions are: length 101 ft., breadth 21.5 ft., depth 11 ft.; tonnage, 152 gross 93 register.

The West Vancouver Ferry Co. has appointed the following officers for its vessels for the current year:—Doncella, D. Smith, captain; R. Pyne, chief engineer. Sea Foam, E. Sloane, captain. Sonrisa, P. H. Johnson, captain; R. Rhodes, chief engineer. West Vancouver No. 5, A. A. Findlay, captain; H. L. Thompson, chief engineer.

The Grand Trunk Pacific Coast Steamship Co. has arranged to make calls at Surf Inlet, on the west coast of Princess Royal Island, the s.s. Prince John, from Vancouver on Fridays, calling there when northbound, and the s.s. Prince Albert calling when southbound, every other trip, i.e., monthly, from Prince Rupert to Vancouver.

The Canadian Fish and Cold Storage Co., Prince Rupert, has appointed the following captains and chief engineers, respectively, for its steam vessels for the current season:—Andrew Kelly, Capt. Stinson and R. Blance; Chief Zibassa, Capt. Parsons and R. Hesketh; G. E. Foster, Capt. Gilmour and J. Dick; James Carruthers, Capt. Knightail and H. Troland.

The name of the steamboat William Joliffe, recently acquired from the Department of Marine by the C.P.R., has been changed to Nitinat. She has the official number 91,255, and is registered at Victoria.

The C.P.R. s.s. Princess Victoria, which has been undergoing a thorough overhauling at Esquimalt, returned to service, May 7, replacing the s.s. Princess Charlotte, which was docked for a short overhaul.

The Terminal Navigation Co., Vancouver, is reported to have purchased the s.s. Joan from the C.P.R., and it is said that after extensive alterations she will be renamed and placed in service to Howe Sound and Bowen Island. She was built at Victoria in 1892, and is screw driven by engine of 85 n. h. p. Her dimensions are, length 176.8 ft., breadth 30 ft., depth 11 ft.; tonnage, 821 gross, 544 register.

The construction of the breakwater at Ogden Point, Victoria, is progressing satisfactorily. It will extend into deep water for 2,530 ft., the greatest depth of water being 75 ft. For about 1,400 ft. the bed of the breakwater has been laid from the shore end. This comes to within about 20 ft. of the surface, and it will be capped by large blocks of granite laid by divers. It is anticipated that the work will be completed by the end of 1915. Sir John Jackson, Canada, Ltd., are the contractors.

The extensive alterations to the C. P. R. s. s. Princess Mary, of which some mention has been previously made, cover the lengthening of the vessel by 38 ft. 4 ins. The new portion will contain oil tanks with fuel capacity for 2,000 miles steaming, and will double the second class accommodation, give 24 additional first class staterooms, increase the main deck space for package freight by over 10,000 cubic feet and give accommodation for something over an additional 250 tons of freight, and there will also be much increased space in the hold. It is expected that with the additional length, and the use of oil as fuel, the average speed will be considerably increased. The new dimensions are, length 238.33 ft., breadth 40.15 ft., depth 14.05 ft.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

133. Apr. 20. Quebec, River St. Lawrence, Orleans Island, St. Laurent, new lighthouse under construction, intended change in character of light .

134. Apr. 25. Ontario, Lake Ontario, Whitby harbor, dredging, buoys established.

135. Apr. 25. Ontario, Detroit River, Ballard Reef channel, lights exhibited temporarily from Fort Malden range towers.

136. Apr. 25. Ontario, Georgian Bay, Byng Inlet, buoyage, corrections.

137. Apr. 28. Nova Scotia, south coast, off Little Hope Islet, change in color of gas and whistling buoy.

138. Apr. 28. Nova Scotia, south coast, Beaver harbor, Hardwood Island, light to be established.

139. Apr. 28. Nova Scotia, south coast, Isaac harbor, change in color of gas and whistling buoy.

140. Apr. 28. Nova Scotia, south coast, Cape Breaker, change in color of bell buoy.

141. Apr. 30. Ontario-Quebec, Ottawa River, Green shoal, dredging, buoys established, East Templeton, buoys established.

142. Apr. 30. United States of America, Lake Superior, Isle Royale light station, change in character of light.

143. May 2. Nova Scotia, Bay of Fundy, westward of Lurcher Shoal, depth of water, caution.

144. May 2. Prince Edward Island, north coast, Cascumpecque harbor, Alberton, change in position of range lights.

145. May 2. New Brunswick, east coast, Miramichi Bay, Preston Beach, range lights improved.

146. May 2. Quebec, Gulf of St. Lawrence, Perce, position of buoy.

147. May 2. Quebec, River St. Lawrence, Cap de la Madeleine, dredging, extension to wharf.

148. May 6. British Columbia, Vancouver Island, west coast, Obstruction Island, Rocky Pass, day beacon erected.

149. May 6. British Columbia, Vancouver Island, Alberni Canal, First Narrows, day beacon erected.

150. May 6. British Columbia, Vancouver Island, Alberni Canal, Second Narrows, day beacon erected.

151. May 6. British Columbia, Vancouver Island, Juan de Fuca Strait, Sooke Inlet, beacons not in position.

152. May 6. British Columbia, Boundary Bay, Mud Bay, change in position of beacons.

153. May 6. British Columbia, Malaspina Strait, Pender harbor, Williams Island, day beacon erected.

154. May 6. British Columbia, Smith Sound, Takush harbor, Fly basin, uncharted shoal.

155. May 7. British Columbia, Vancouver Island, Saanich Inlet, Tozier Rock, spindle erected.

156. May 7. British Columbia, Strait of Georgia, Active Pass, submarine bell buoy moored near Gossip shoals bell buoy.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Independent Pneumatic Tool Co., Chicago, has issued circular E 1, descriptive of the new Thor electric drill.

Northern Electric Co., Ltd., Montreal, has issued a bulletin of 24 pgs, 7½ by 10¾ ins., describing and illustrating its low voltage lighting outfits.

The General Railway Signal Co. of Canada, Montreal, has issued catalogue B, part 7, covering its R. S. A. mechanical dwarf signal.

Canadian Westinghouse Co., Ltd., Hamilton, Ont., has issued circular 1137, 24 pages, 7 by 10 in., on watt hour meters for alternating current and direct current.

Canadian Detroit Lubricator Co., Walkerville, Ont., for which Taylor & Arnold, Ltd., Montreal, are Canadian Sales Agents, has issued a booklet of 12 pgs., 4½ by 7½ ins., describing and illustrating Detroit automatic plunge lubricators.

The Brown Hoisting Machinery Co., Cleveland, Ohio, has issued catalogue D. 1914, 64 pages, 6 by 9 ins. "Brown Hoist Tramways Systems, Trolleys, Electric Hoists," dealing with the overhead or tramway system of handling all kinds of material by railways and industrial plants.

James T. Gardner, Inc.—The railway equipment business which was carried on by James T. Gardner, at 615 Railway Exchange, Chicago, until his recent sudden death, will in future be carried on by James T. Gardner, Inc., with the following officers: President, M. Gardner; Vice President, R. H. Gardner; Secretary, A. V. Talbot; Treasurer, A. M. Talbot.

The United States Light and Heating Co. has removed its general offices from 30 Church St., New York, N. Y., to its plant at Niagara Falls, N. Y., thus bringing together the administrative, sales, engineering, and production departments. The New York sales office and service station has been transferred to the Locomobile Building at 16 West 61st St., New York, N. Y.

Butterfield & Co., Inc., of Rock Island, Que., manufacturers of taps, dies, screw plates, reamers, etc., are preparing plans for a new brick and re-inforced concrete factory building there. About a year ago, their plant was purchased by the Union Twist Drill Co. of Athol, Mass., manufacturers of twist drills and milling cutters. The new building is to be 185 by 60 ft. wide, and 3 stories high, and when completed, a portion of the building will be used for the manufacture of drills and milling cutters for the Canadian trade. The plant will continue to be operated under the name of Butterfield & Co., Inc., with no change in the management.

The Detroit Lubricator Co., advises that it will exhibit the new Detroit flange lubricator for the first time at the M. C. B. and A. R. M. M. conventions at Atlantic City in June, in space 637, the same it has occupied in several years past. The exhibit will consist of two wooden models of 45 degree sections of locomotive drivers, with the lubricator installed in the same manner as in actual service. The whole apparatus will be rocked back and forth by an ingenious electrical contrivance to approximate working conditions on the road. The lubricator will feed oil on the flanges every time the lateral motion becomes pronounced and easy observation of its construction and operation will be made possible by removing sections to display the internal mechanism. In addition to this a No. 22 bullseye locomotive lubricator, air cylinder lubricator and transfer filler will be shown in operation. A complete line of locomotive lubricators with from one to eight feeds, automatic steam chest plugs, air cylinder lubricators, transfer fillers, with sectional models and cross sections of parts will be displayed.

Among the Express Companies.

F. S. Love, Local Manager, Dominion Ex. Co., Saskatoon, Sask., has been transferred to Fort William, Ont., vice E. P. Burnell, transferred to Saskatoon, Sask.

E. P. Burnell, Local Manager, Dominion Ex. Co., Fort William, Ont., has been transferred to Saskatoon, Sask., vice F. S. Love, transferred to Fort William.

The Canadian Northern Ex. Co. has reopened its offices at Berton, Man., and Brooking, Sask., has opened offices at Gravelbourg and Mitchellton, Sask., and has closed its offices at Delmas, Sask., and Minburn, Alta.

The Western Ex. Co., which operates over the Minneapolis, St. Paul and Sault Ste. Marie Ry., Duluth, South Shore and Atlantic Ry., Spokane International Ry., and the C.P.R., has arranged to open offices in Chicago, Ill., and Milwaukee, Wis., by July 1.

Telegraph, Telephone and Cable Matters.

The Great North Western Telegraph Co. has opened offices at Cardinal Canal and Charing Cross, Ont., and has reopened its summer office at Rosseau, Ont.

The Canadian Northern Telegraph Co. has reopened its offices at Berton, Man., and Brooking, Sask.; opened offices at Hughton, Sask., and Minburn, Alta., and has closed its office at Delmas, Sask.

The C.P.R. has completed the erection of a telegraph line along its recently built Weyburn-Lethbridge extension, connecting direct with Moose Jaw, Sask., and wire is also being erected westward from Shaunavon, Alta., keeping pace with railway construction. D. Coons is Superintendent of Telegraphs, Saskatchewan Division.

The G. T. Pacific Telegraph Co.'s system, which has chiefly been erected in conjunction with the laying of the railway track, has been completed between Port Arthur, Ont., and Prince Rupert, B.C., but the commercial service is only in operation as far west as Prince George, B.C. It will, however, be completed through to the coast very shortly. The installation of a telephone train dispatching system is also proceeding. A. B. Smith is Manager of Telegraphs, G.T.P.R.

Transportation Conventions in 1914.

June 10-12.—Master Car Builders' Association, Atlantic City, N.J.

June 15-17.—American Railway Master Mechanics' Association, Atlantic City, N.J.

June 16.—Train Despatchers' Association of America, Jacksonville, Fla.

June 16-19.—American Society of Mechanical Engineers, St. Paul and Minneapolis, Minn.

June 18,19.—Association of Transportation and Car Accounting Officers, Atlantic City, N.J.

June 24.—Association of American Railway Accounting Officers, Minneapolis, Minn.

June 30-July 4.—American Society for Testing Materials, Atlantic City, N.J.

July 14-17.—International Railway General Foremen's Association, Chicago, Ill.

July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.

Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.

Sept. 1-4.—American Boiler Manufacturers' Association, New York.

Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.

Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Nashville, Tenn.

Sept. 22-24.—Railway Signal Association, Bluff Point, N.Y.

Oct. 12-16.—American Electric Railway Association, Atlantic City, N. J.

Oct. 19-23.—Association of Railway Electrical Engineers, Chicago, Ill.

Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.

Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, Counsel, F. King, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, J. S. Bianchet, Quebec.

Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.

Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

Proposed Government Control of Rates on Steamboats.

been introduced into the House of Commons, as an amendment to the Railway Act, providing that the clauses relating to accommodation for traffic tolls, classification of freight and tariffs, shall so far as applicable apply to all steamboat companies, owners, and steamboats engaged on a regular route carrying passengers or freight or both, from one port to another in Canada, or from a port in Canada to a port outside of Canada, and all traffic agreements between steamboat owners and railway companies and other persons, and all questions of the places along the route where steamboats shall call for traffic, the time of call, and duration of stay, shall be subject to the approval and control of the Board of Railway Commissioners. For the purposes of the bill, a steamboat is described as any vessel propelled wholly or in part by steam or any other machinery or power other than sails or oars.

The Department of Customs has issued a memorandum to officers at the various outports, covering instructions for collectors of customs in connection with the Radiotelegraph Act, chap. 43 of the statutes of 1913. These quote the clauses of the act, which Canadian Railway and Marine World has already fully dealt with, making compulsory the equipping of vessels of a certain class with wireless telegraphy, and describing the type of apparatus and qualifications of the operators, etc.

THE TORONTO, HAMILTON AND BUFFALO RAILWAY COMPANY.

Hamilton, Ont., May 2nd, 1914.

Notice is hereby given that the Annual General Meeting of the Shareholders of this Company, for the election of a Board of Directors, and for the transaction of such other business as may be brought before the meeting, will be held at the office of the Company, in the City of Hamilton, Province of Ontario, Tuesday, June 2nd, 1914, at 11 o'clock in the forenoon.

DWIGHT W. PARDEE,
Secretary.

THE VICTORIA ROLLING STOCK AND REALTY CO. OF ONTARIO, LIMITED.

NOTICE is hereby given that a dividend of three per cent. on the paid-up capital stock of the Company for the half-year ended May 30th, 1914, has been declared payable June 1st, 1914, to the shareholders of record as of the 30th of May, 1914.

By order of the Board,

G. T. CHISHOLM, Secretary.

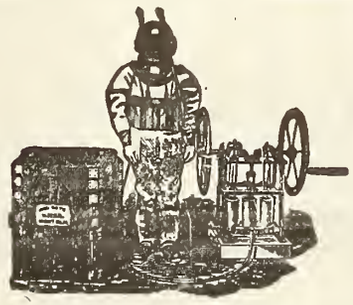
Toronto, May 20th, 1914.

THE CANADA SOUTHERN RAILWAY

The Annual General Meeting of the Shareholders of The Canada Southern Railway Company, for the election of Directors, and for other general purposes, will be held at the Company's Head Office in the City of St. Thomas, Ontario, on Wednesday, the 3rd June, 1914, at 11 o'clock in the forenoon.

DWIGHT W. PARDEE,
Secretary.

St. Thomas, Ont., May 1, 1914.



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DUNER CO. 101 S. CLINTON ST. CHICAGO

Coal and ash handling conveyors, belt conveyors, structural steel, heavy machine and foundry work, coal mine bankheads and screening plants, mine fans, etc.
Engineers and Contractors
THE EASTERN STEEL CO., LTD.
Formerly the Brown Machine Co., Ltd., and Bailey-Underwood Co., Ltd.
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POSITION WANTED.
Transportation manager (Scotch), twenty years' experience British railways, offers skilled services to railroad or steamship company at moderate salary. Exceptional references and qualifications. Apply Box 117, Canadian Railway and Marine World, Toronto.

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MANUFACTURERS OF
Steam and Electric Railway Cars and Special Cars.

MILLER
Boiler Washing System
Utilizes Blown-off Products from Locomotive Boilers to Heat Water for : :
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Have on hand at all times
First - Class Freight and Passenger Locomotives
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of all descriptions to stock or special design, apply to
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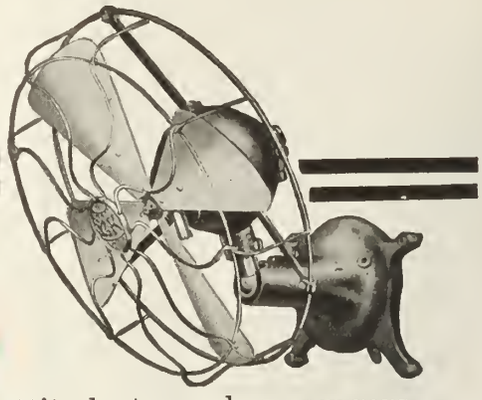
Make Summer Travel a Pleasure



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This is the kind of service a travelling public appreciates, especially in hot and sultry weather—service that creates good will and appreciation of your attitude toward passengers.

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Address our nearest House for full Particulars.

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A DELIGHTFUL summer cruise through a land of indescribable beauty—a country famed for its traditions, picturesque scenery and invigorating climate.

Niagara Falls, Toronto, Lake Ontario, Thousand Islands, St. Lawrence River Rapids, Montreal, Quebec, Murray Bay, Tadousac, Saguenay River Canyon, Capes Trinity and Eternity, Laurentian Mountains.

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A newly inaugurated cruise in strange waters. From Quebec along the north shore of the Gulf of St. Lawrence and into the finest hunting and fishing grounds in North America.

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From Montreal, through the St. Lawrence River, along the south shore of the Gulf, past the rugged shores of New Brunswick, Nova Scotia and Prince Edward Island; terminating at Pictou, N.S., and stopping at all important points enroute.

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The all-water route between New York and Quebec, via Ocean, Gulf and River. A healthful cruise of unusual charm and interest.

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Until YOU have had an opportunity of trying them out at OUR expense.

This refers to

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If you are really interested in a strictly *"non-obligating"* proposition, fill in the coupon. It costs you nothing.

The Trolley Supply Co.

Canton, Ohio, U.S.A.

Gentlemen:
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is the sensible way—the way that over 5,000 section foremen are taking their crews out to work every morning. Just like going to work in an automobile. They are not tired out from pumping a hand car eight or ten miles before beginning their real work, and then when it comes time to go home they have another "joy ride."

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THE MIGHTY FAIRMONT

Section men in every State in the Union, in Canada and in Mexico, are using them. And every one of these section men will tell you that they are the best engines ever made for hand-car purposes. They are the lightest in weight, strongest in power and the most economical in the use of gasoline. They are instantly reversible, and will run a car at any speed from 3 to 40 miles an hour. They will pull a push car loaded with 60 ties and eight or ten men at a speed of 15 to 20 miles an hour.

We make them in 3 and 5 horse power sizes, equipped with everything needed to mount them on a hand-car, and sell them on a MONTHLY PAYMENT PLAN. You just pay a small amount to us each pay day—no more than every one of you can afford.

Mr. Comer Turpin, of the S.L. & S.F. Ry., McPherson, Kansas, writes: "I have covered a little over 9,000 miles with my Fairmont car at an actual outlay for repairs of only $1.17. There is no engine in the world that has beaten or come up to this in efficiency or cheapness of maintenance, I believe. My engine is in first-class condition and is good for 50,000 miles yet."

We also manufacture a Roadmaster's Inspection Car and a Bridge Builder's Car, complete descriptions of which will be sent with our catalogue and price sheet. Write a postal to-day, giving your name and address, and send it to

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Boiler Feed Water Treatment

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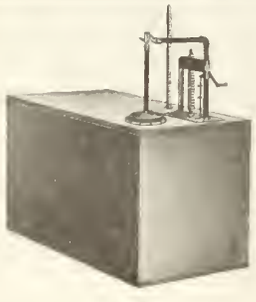

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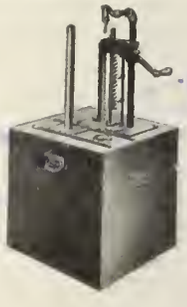
For Lubricating Oil
Sizes, 1 to 5 barrel



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Outfit for
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"Oil Barrel" methods are fast dissappearing in progressive profit-producing railway and ship yards.

The oil must show a profit with the rest of the work. Oil kept in a barrel and dipped out is wasted and lost. The floor around any oil barrel will show you why. Also, a certain amount of oil is left in each barrel—anywhere from four to seven per cent, which virtually means throwing so much good money away. "Times have changed." Oil is now being stored and handled in these places by

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One railroad alone has reported a saving of over $6,000.00 in one year—more than the cost of the Bowser equipment. Multiply this by added years of use and figure the grand saving.

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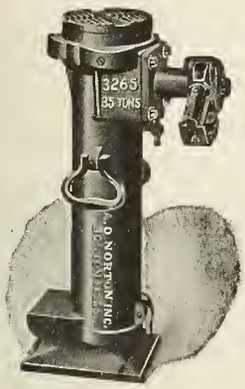

They lift and lower their full rated capacity **Four Times** as fast as other Ball Bearing Jacks of equal capacity.

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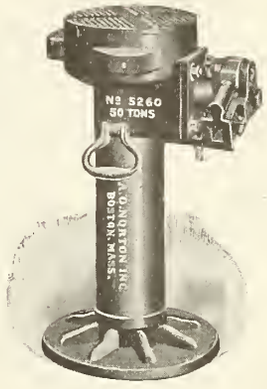
Send for complete catalogue and Discount.

35 and 50 Tons capacity. **Plain and foot lift.**



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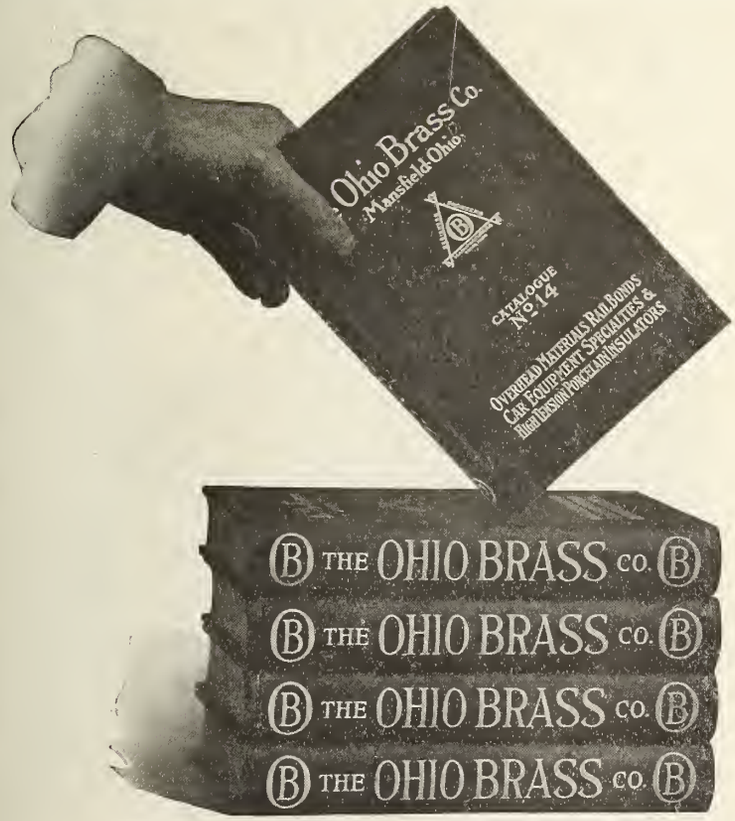

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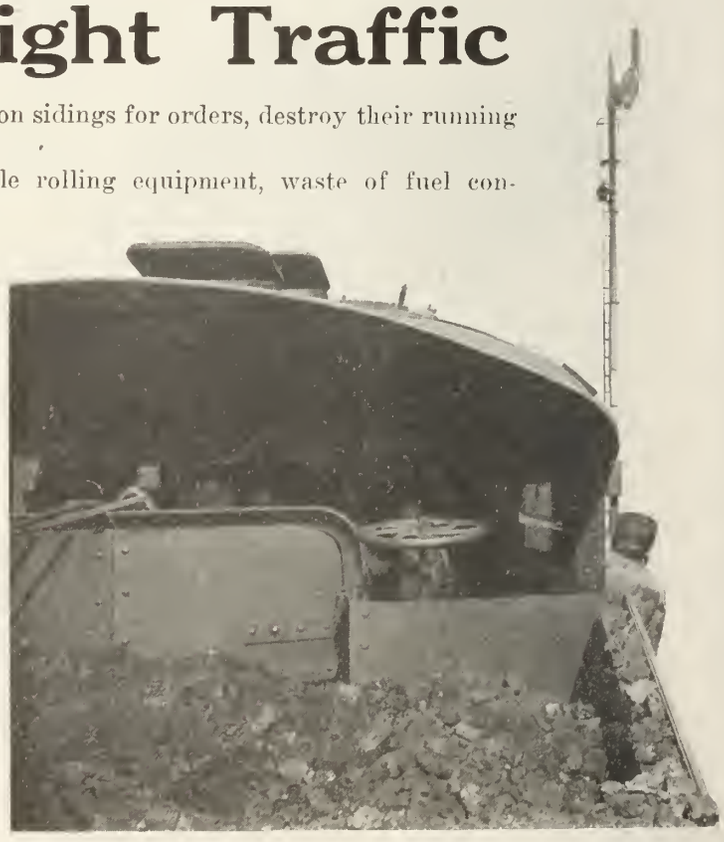
On your single track lines, why hold your freight trains on sidings for orders, destroy their running time and cause delays in traffic?

The equivalent of these delays—loss in crew's time, idle rolling equipment, waste of fuel consumption—are a loss in actual dollars to the earning power of that particular line. **The A. P. Block System of Automatic Signaling** reduces delays to a minimum and keeps your traffic moving.

This system of signaling, operating on a principle invented by us, not only prevents opposing trains from entering the same section of single track between sidings, but allows trains moving in a like direction to follow each other as closely as if running on the same track of double-track line.

Each siding delay is a reason for installing the **A. P. Block System.**



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PRICE LIST C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths	
10 in.	1	⅜, ½, ¾, 1 in.	$5.00	$2.25	⅜, ½, ¾, 1 in.	$ .75
20 in.	2½	¾, 1, 1¼, 1½, 2 in.	7.50	2.50	¾, 1, 1¼ in.	1.00
					1½, 2 in.	1.25
25 in.	3½	1½, 2, 2½, 3 in.	7.50	3.00	1½, 2, 2½, 3 in.	1.25

Prices on larger sizes furnished upon application.

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DESIGNED ESPECIALLY to handle pipes spaced closely as in coil work. No. 2½ wrench illustrated requires but three-quarter inch space between pipes.

POSITIVE GRIP instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

RATCHET-LIKE ACTION. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

CAN'T CHEW. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

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SAVES TIME AND MONEY.

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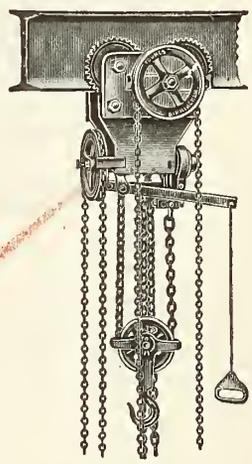

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Close Corner Piston Air Drills

Are the Original No.'s 8 and 9 Close Quarter Machines

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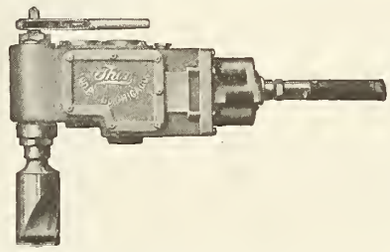

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LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.
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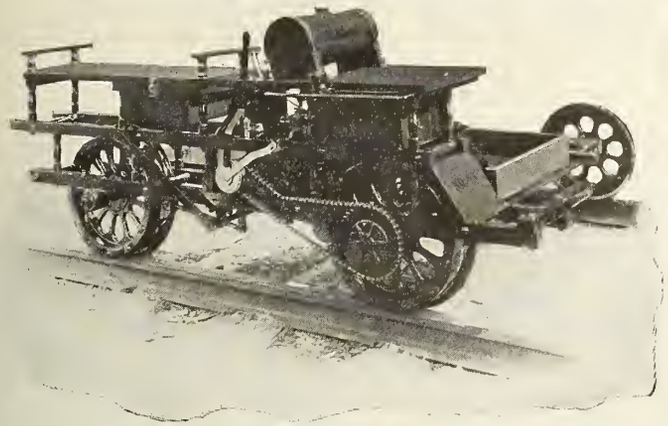

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For HAND and PUSH CARS

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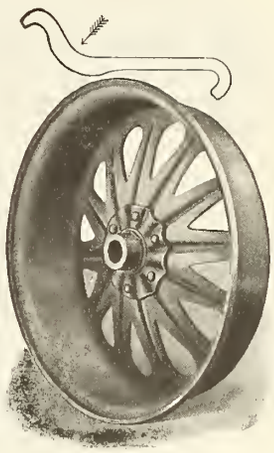

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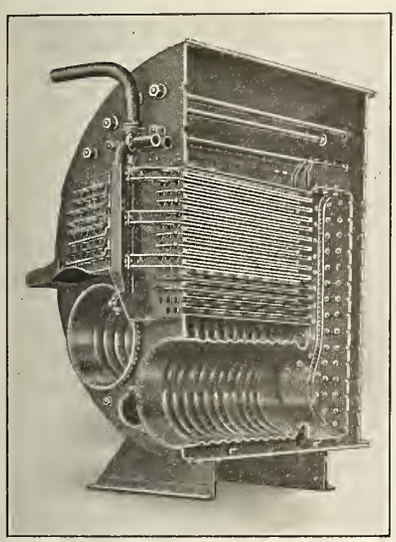

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Saves from 10% to 25% of fuel per unit of power developed.
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Increases power output of a given marine power plant from 10% to 25%.
Is adaptable to either new or existing boilers of the fire tube type, with no change in their design or construction.

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STRAIGHT LINE COMPROMISE OR STEP INSULATED FOR SIGNALS

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for pounded rail made to fit any style rail

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Raises the worn or cupped rail to the level of the adjoining rail and holds it there. The rail is then ground even as shown. ATLAS SPECIAL JOINT made either suspended or supported. Ask for circular A-52.

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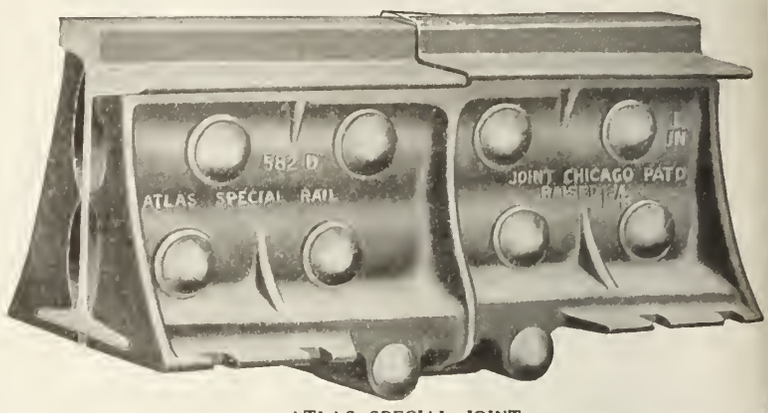
Dotted line shows the worn rail before it is ground off. This will renew the life of your rails.



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has been proved by the use of Continuous Weber and Wolhaupter base-supported rail joints—after fifteen (15) years' service, having a record of over 50,000 miles in use—the extent of which is evidence of their excellence. Made in Canada.

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Over 50,000 miles in use.

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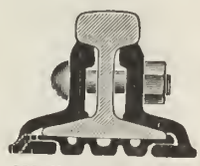

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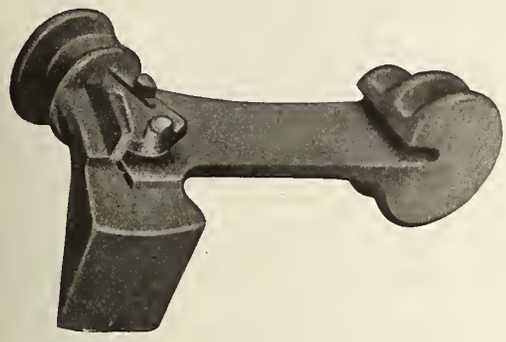

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A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

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We license manufacturers and railways to build and use the Pay-As-You-Enter Car, the Patents on which are owned by

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Any manufacturer can make one or one dozen taps which are accurate and correct in diameter and lead, but to furnish, year after year, thousands of Taps in various styles and sizes that are absolutely accurate and uniform means a splendid organization of help and expensive and modern equipment. All of these are incorporated in the plant which makes Butterfield Taps and Reamers. All sizes and styles carried in stock. Ask your dealer for them or write direct for complete catalogue and discounts.

Butterfield & Co.

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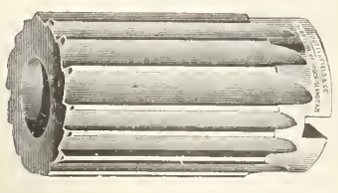

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It holds the Fare Box in a rigid, upright position, preventing it from rattling when the car is in motion.

The Box cannot become dislodged, nor is there any wear on the leather covering, as is the case with the ordinary metal boxholder.

We supply these hangers in red or yellow brass as desired, and can make prompt shipment.

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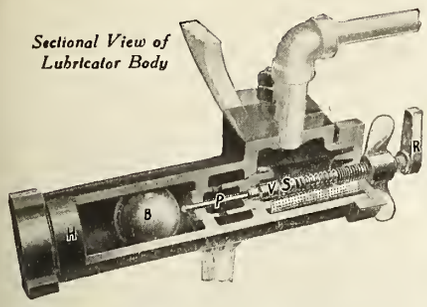

Sectional View of Lubricator Body

New Detroit Flange Lubricator

The Detroit Flange Lubricator is automatic. It gives efficient flange lubrication just when it is needed. The feed is governed entirely by the requirements of the service.

The lubricator consists of an oil tank or reservoir, mounted in any convenient place, and a feed nozzle on the flange; between these is the lubricator body with a ball valve controlling the flow of oil from the tank to the flange.

The ball B rolls against the plunger P, opening the valve V and allowing oil to reach the flange whenever the locomotive acquires a swinging or rolling motion, as on curves.

The lift of the valve, and consequently the amount of oil fed, are controlled by the tension of the spring S.

The Detroit Automatic Flange Lubricator does not require any attention from the engineer as in the case of manually operated devices. Starting and stopping at every curve are done away with.

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It requires no steam, and therefore cannot freeze.

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The Detroit Automatic Flange Lubricator is the product of the experience, skill and manufacturing facilities of the oldest and largest manufacturers of lubricating devices in the world. It is the result of several years' research and experimental work.

It is, without a doubt, the most efficient, economical and practical device for reducing flange wear on the market.

Catalogue FO-81 tells all about it.

CANADIAN DETROIT LUBRICATOR COMPANY, LTD.
WALKERVILLE, ONT.

Canadian Sales Agents:
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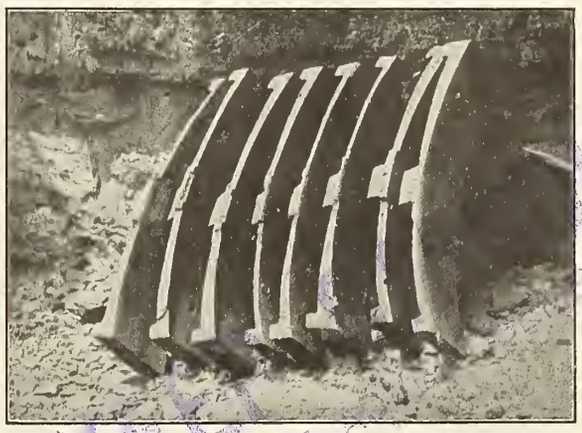

wear as shown above, before they are scrapped and they wear safely, too. You get your full money's worth in satisfactory service from them always.

Steel Back Car, Coach and Driver Shoes are absolutely essential for safe and economical operation in heavy and high-speed service.

Manufactured in Canada.

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It Leaves a Better Finish
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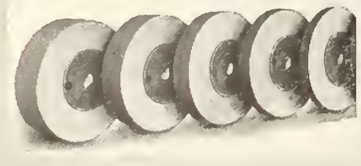
Aloxite Cloth

The Cloth That Cuts

YOU will note the difference between Aloxite Cloth and the old-time finishing cloth the minute you use it.

Aloxite Cloth cuts—cuts clean and quick—it is uniformly coated, and the Aloxite grains—wonderfully hard, sharp, and tough—stay on. The difference is in speed, finish, uniformity, and economy.

Supplied in sheets or in the economy rolls, ½ to 2 inches wide, mounted on metal spool.



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Works: Niagara Falls, N. Y.
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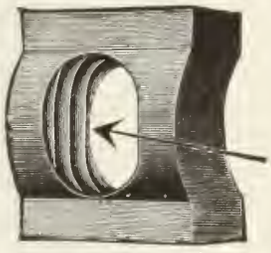
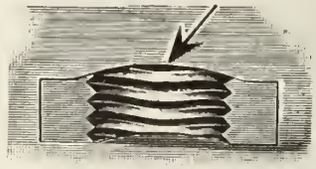
20th Century Nut
The Grip Nut





This cut shows an exaggerated curve in pitch thread—or more than is given in practice, in order to emphasize this feature.

The vise-like grip obtained on the threads of bolts by the application of Grip Nuts secures a result different from that of any other locking device, for the reason that it resists equally in both directions, and is entirely independent of anything but the bolt for its locking action. The Grip Nut does not injure the threads of the bolt, and can be applied and re-applied.

SAMPLE NUTS SUPPLIED ON REQUEST.

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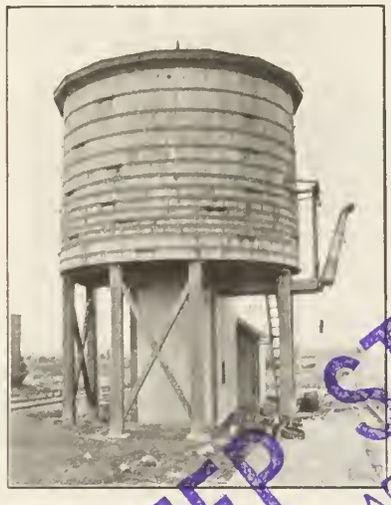
Head Office: 263 St. James St., Montreal, Que.

Works: St. Johns, Que.



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Write Office Nearest You.

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Enamelled iron signs, on account of the brilliancy of their colors, attract immediate attention. They never fade and are as good in ten years' time as the day they are put up.

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HAS THE

STRENGTH AND WEARING QUALITIES

that are absolutely necessary in

LOCOMOTIVE CASTINGS

ELIMINATES ENGINE HOUSE REPAIRS

Made Only by

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Hoists for all kinds of excavating and material handling service, in standard types and sizes, ready for immediate shipment.

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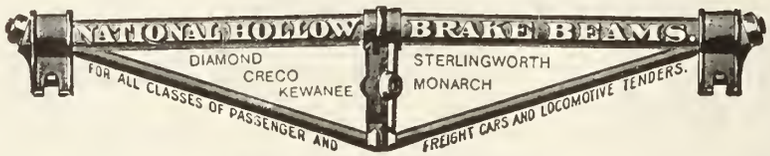

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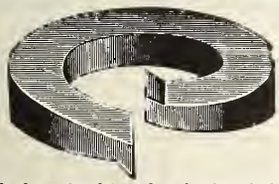

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The Commissioners of the Transcontinental Railway.

NOTICE TO CONTRACTORS.

Tenders for Station at Quebec, Que.

SEALED TENDERS addressed to the undersigned and marked on the envelope, "Tenders for Station at Quebec," will be received at the office of The Commissioners of the Transcontinental Railway at Ottawa, Ontario, until 12 o'clock noon of the second day of June, 1914, for the erection of a Railway Station with Covered Platform, on the Champlain Market Site in the City of Quebec, P.Q., on the line of the National Transcontinental Railway.

Plans, details, and specifications may be seen and full information obtained at the office of Mr. Gordon Grant, Chief Engineer, Ottawa, Ontario; and at the office of Mr. A. E. Doucet, District Engineer, Quebec, P.Q.

Tenders must be made on the forms supplied by the Commission and be signed and sealed by all the parties to the tender, and witnessed, and be accompanied by an accepted cheque on a Chartered Bank of the Dominion of Canada, payable to the order of The Commissioners of the Transcontinental Railway, for a sum equal to ten (10%) per cent. of the amount of the tender.

The cheque received from the party whose tender is accepted, will be deposited to the credit of the Receiver General of Canada, as security for the due and faithful performance of the contract. Cheques received from parties whose tenders are rejected, will be returned within ten days after the signing of the contract.

The right is reserved to reject any or all tenders.

By order,
P. E. RYAN,
Secretary.

The Commissioners of The
Transcontinental Railway.

Dated at Ottawa, May 8th, 1914.

Newspapers inserting this advertisement without authority from The Commissioners will not be paid for it.—61029.

CANADIAN PACIFIC RAILWAY COMPANY.

Dividend Notice.

At a meeting of the Board of Directors held to-day, a dividend of two and one-half per cent. on the Common Stock for the quarter ended 31st March last, being at the rate of seven per cent. per annum from revenue, and three per cent. per annum from Special Income Account, was declared payable on 30th June next to Shareholders of record at 1 p.m. on 30th May instant.

By order of the Board,
W. R. BAKER,
Secretary.

Montreal, 11th May, 1914.

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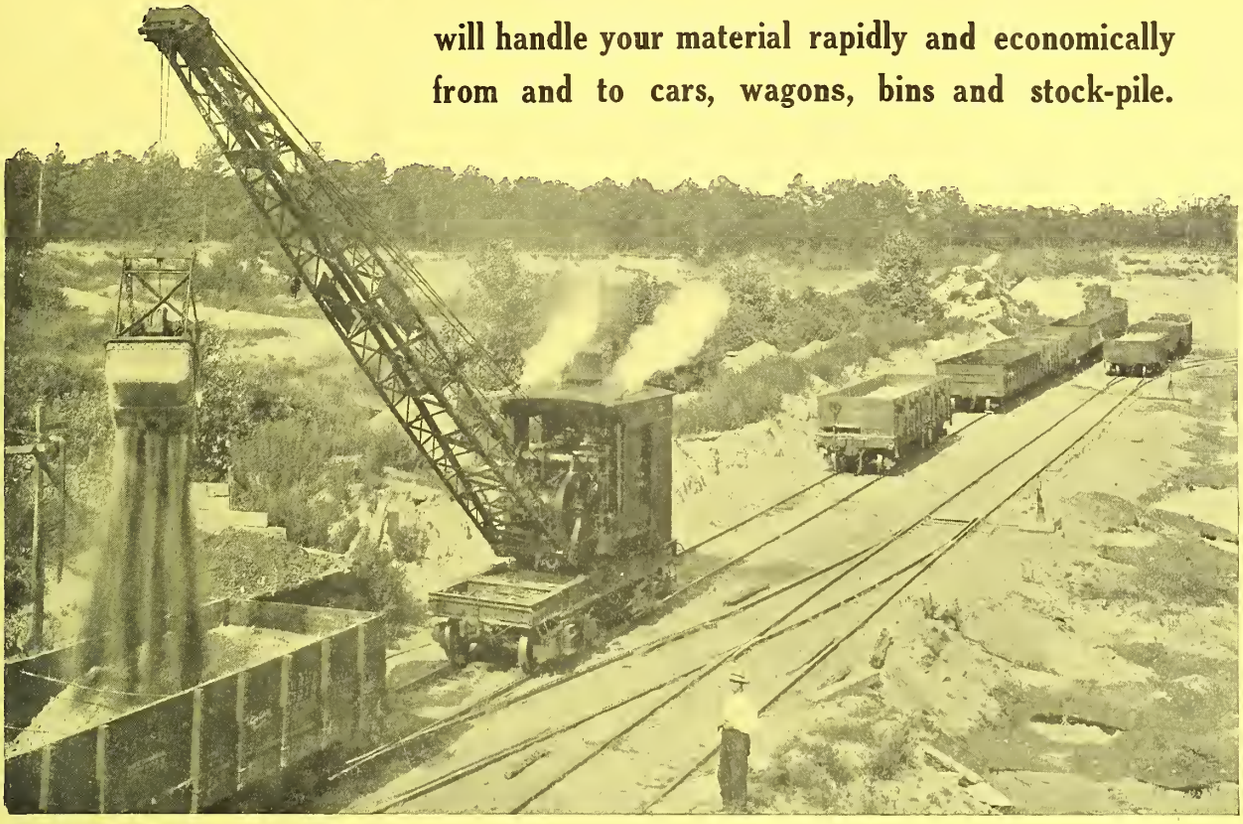
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

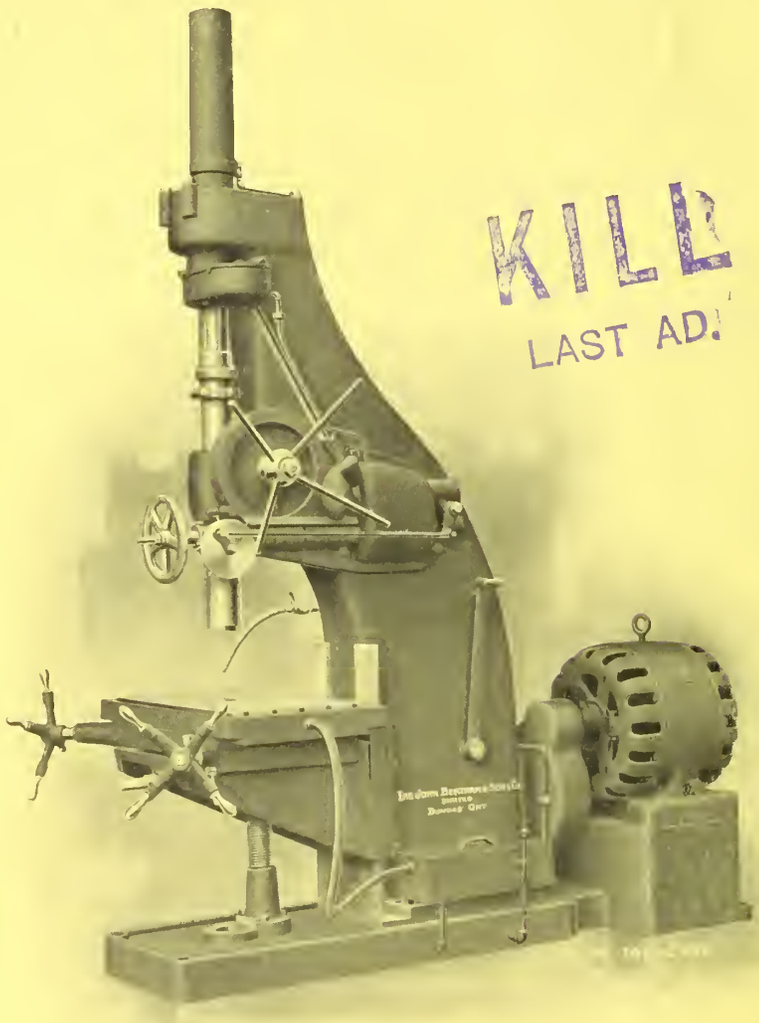
And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO, U.S.A.

Bertram High Speed Drills



KILL
LAST AD.

36-Inch Heavy Duty Vertical Drilling Machine—Motor Driven.

Capacity up to 3½-inch hole in steel.
Photographs and specifications sent on request.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

Agents: The Canadian Fairbanks-Morse Company, Limited

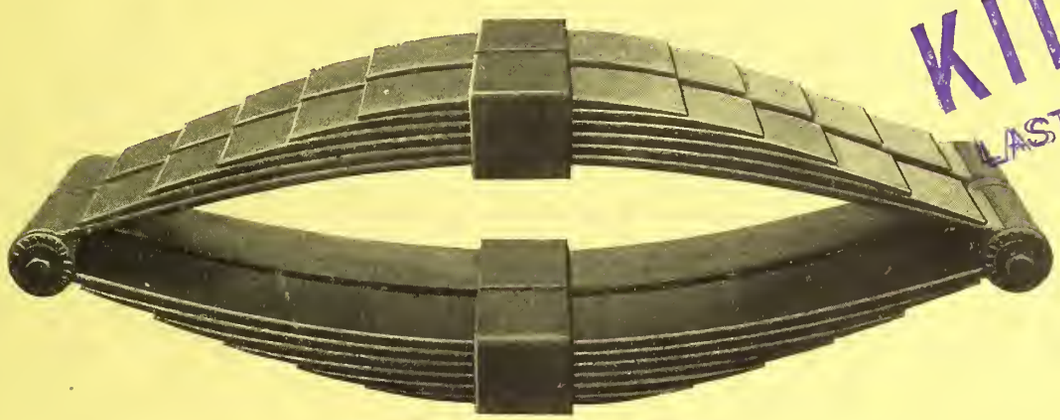
Offices: MONTREAL, TORONTO, WINNIPEG, VANCOUVER, CALGARY, SASKATOON, ST. JOHN.

Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 197 — TORONTO, CANADA, JULY, 1914 — Subscription Rates Page 32

Railway Springs



KILL LAST AD.

COUPLET ELLIPTIC SPRINGS supplied by us to the Canadian Pacific Railway for their latest type of Steel Passenger Cars building at Angus. These Springs comply with the most exacting specification as to variation, yet adapted.

Manufacturers of All Kinds of Springs

Write for Order Forms to

B. J. COGHLIN CO.
LIMITED

Office and Works:

Ontario Street East — **Darling & Davidson**

MONTREAL

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High-Speed Interurban Electric Roads

Would never have attained the present high efficiency without automatic air brakes. For train service automatic brakes are essential.

Westinghouse Automatic Brakes

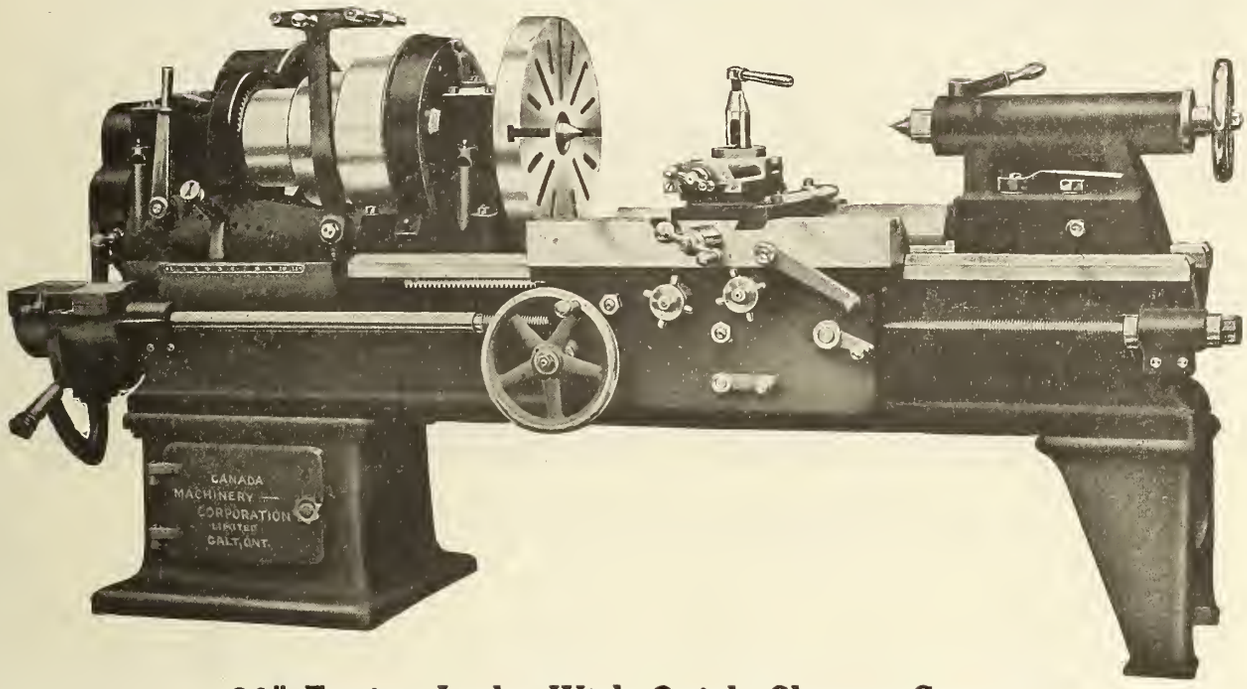
Have been the same important, and in a large sense, controlling factors, in the successful solution of electric road traffic problems, as they have been for years past in steam road operation.

For interurban service the Westinghouse AMM Automatic Brake has a wide range of usefulness. It is especially designed for train service not exceeding five cars. Quick recharge, graduated release, quick service and high emergency pressure are distinctive features of this equipment. A straight-air feature can also be added, allowing the operation of single cars with all the flexibility of straight air.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX	WINNIPEG	CALGARY	VANCOUVER
Traders Bank Building	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.	158 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

LATHES C.M.C. LATHES



20" Engine Lathe With Quick Change Gears.

A SAFETY BELT SHIFTER IS PART OF THE STANDARD EQUIPMENT OF ALL OUR LATHES.

The practice of shifting lathe belts from step to step of the cone by hand is dangerous, and in the present time of "SAFETY FIRST" movement this practice should receive attention.

A point to be considered.

By the use of our improved belt shifting device the operator can easily and quickly shift the belt without endangering himself.

The head stock of all our lathes is of unusually massive construction, and is equipped with extra wide faced cones to enable modern high speed steel to be used advantageously.

We have a lathe catalogue giving all the details of the improved design and construction of our lathes which we would be pleased to send on request.

We are Canada's largest lathe builders.

Representatives:—

QUEBEC:
Williams & Wilson, Limited,
Montreal

MANITOBA:
The A. R. Williams Machinery Co., Ltd.,
Winnipeg

Canada Machinery Corporation, Ltd.

GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.

SUPERHEATER FREIGHT LOCOMOTIVES

KILL
LAST AD.

BUILT FOR THE CANADIAN PACIFIC RAILWAY

Gauge, 4′ 8½″. Diameter and stroke of cylinders, 23½ x 32″. Diameter of driving wheels, 63 ins. Driving wheel base, 16′ 6″. Engine wheel base, 25′ 5″. Total wheel base, 55′ 11⅛″. Weight of engine in working order, 223,000 lbs. Weight on drivers in working order, 198,000 lbs. Tractive power, 45,420 lbs. Tender tank capacity, 5,000 Imperial gallons. Tender coal capacity, 12 tons. Weight of tender in working order, 134,000 lbs. Locomotive equipped with vestibule cab, and coal hopper on tender tank operated by air cylinders.

CANADIAN ALLIS-CHALMERS,
LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

LIDGERWOOD CABLEWAYS

FOR EXCAVATION AND CONSTRUCTION

An interesting application of cableways for both excavation and construction is shown in the above illustration of work now under way at Grand Mere, Que., for the Laurentide Co.

The work includes building a dam and power house, excavating 110,000 cubic yards of solid rock and placing 175,000 cubic yards of concrete.

Three Lidgerwood Cableways are employed. The long span is 1,683 ft. (towers at extreme ends in picture). This cableway takes concrete from the mixing plant, rock and sand storage (extreme right in picture) to the dam and power house. The intermediate span, 1,118 ft., takes rock to crusher and storage pile. The short span, 613 ft., takes the rock, sand and cement to the small auxiliary crusher plant on top of the present mill building, where the concrete is discharged directly into the power house foundations and walls.

The long span cableway handling concrete in 2-yd. batches has delivered 387 cubic yards in a 10-hour day at 1,100 ft. distance. There will be a 4th cableway forming a separate unit for constructing the dam at the right in the picture.

The two long span cableways are each equipped with our latest improved aerial dumping device giving operator complete and accurate control. H. E. TALBOTT & Co., Contractors. GEO. F. HARDY, Designing Engineer.

Double-Jointed Shock-Absorbing Carrier Top.

SHOCK-ABSORBING FALL ROPE CARRIERS

Nothing that the Lidgerwood Mfg. Co. ever produced meant more for efficiency than this type of fall rope carrier. Instead of a slotted head, receiving a wedging impact against the button at two points only, the button collides with an eye or ring. The impact is distributed equally round the face of the eye. The eye does not weigh one-tenth as much as the slotted head and if subjected to the same strain would stand harder usage. The shock-absorbing action is so thorough that these carriers have been operated experimentally for hours without damage at speeds up to 3,000 ft. per minute.

Swinging Eye at Head of Carrier

Exclusive Agents for Canada

CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Weatherproof Wiring Devices

For Amusement Parks, Summer Gardens and Open Air Theatres

Porcelain Sockets, with and without suspension hooks for guy wire construction.

Mogul Base Weatherproof Socket
1500 Watts—250 Volts

Porcelain Weatherproof Socket with half-inch cap for medium screw base lamps.

Porcelain and Moulded Material Pendant Type.

650 Volt Aluminum and Brass Shell Weatherproof Sockets.

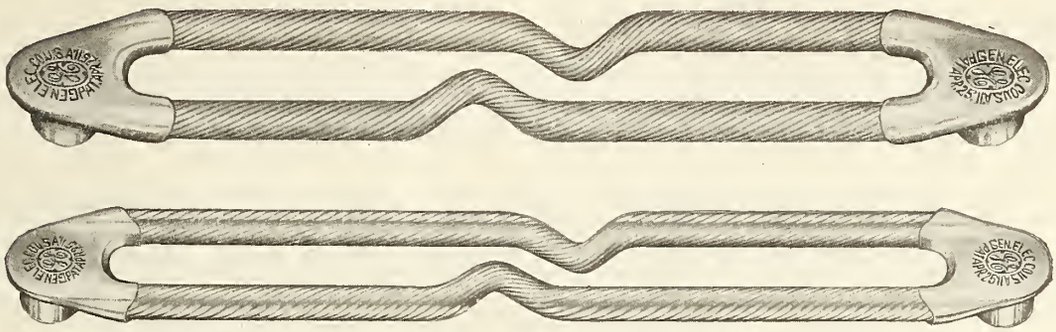
C-G-E Reliable Wiring Devices are Sold by all Leading Dealers of Electrical Material.

CANADIAN GENERAL ELECTRIC COMPANY,

LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



Look Inside Your Railbonds

and prove C-G-E quality for yourself

The outside appearance of a railbond is an insufficient indication of its quality. You must get inside.

C-G-E Railbonds Are Properly Welded

Saw the stud on a railbond terminal through to the weld and break off one part. If properly welded, a bright, clean break will be shown.

C-G-E Railbond Studs Will Flow Under Compression

Compress the terminal of one of your railbonds into a grooved hole in a steel block of the same thickness as a rail section. If the stud is soft and malleable, a cross section will show the grooves completely filled with copper.

C-G-E Railbond Studs Are Ductile

Smash down a terminal stud to a thickness of a quarter inch. If the copper is really ductile, it will show no cracks.

Do not take the quality of your railbonds for granted. Try them out for yourself and know.

Will the Railbonds You are Using Stand These Tests? C-G-E Bonds Will.

KEEP STANDING
LAST ADVERTISEMENT.

CANADIAN GENERAL ELECTRIC COMPANY,

LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

A Fatter Profit
On the Small Concrete Job
The SMITH HAND MIXER
WILL SOLVE YOUR PROBLEM

It Does Away With the Old Fashioned, Back-Breaking Method of Mixing by Hand. It Gives Better and More Concrete.

The Workmen Prefer It

Actual Records of Twenty-five Yards Per Ten Hour Day Are Behind This Mixer

PUT IT OVER THE FORMS, THREE COMPLETE REVOLUTIONS GIVE A PERFECT MIX. YOU THEN DISCHARGE RIGHT INTO PLACE, DOING AWAY WITH THE WHEELING OF YOUR CONCRETE

Pamphlets on Request

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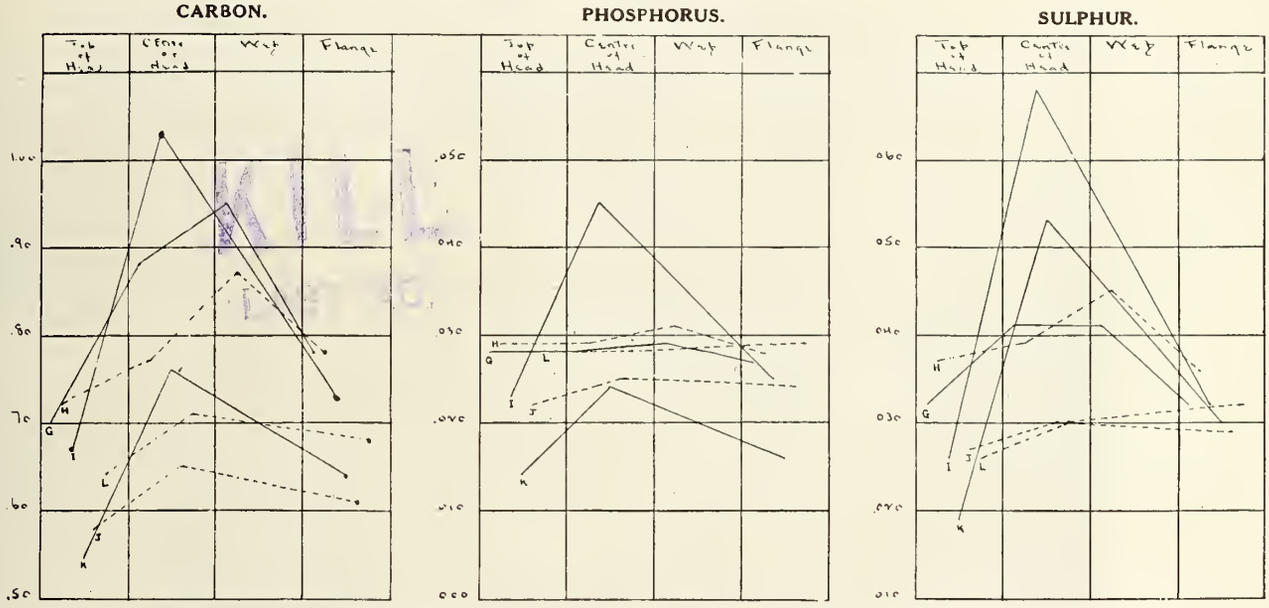
CALGARY 10th Ave. and 3rd St. East	VANCOUVER 101 Water St.	QUEBEC 31 St. Louis St.	HALIFAX 78 Granville St.

Excessive Segregation is Responsible for 50% of the Total Rail Failures

The following diagrams show comparative segregation of carbon, phosphorous and sulphur in seven samples of Standard and the same number of Titanium Treated Open Hearth Rails, consecutively examined, as reported in detail in our Rail Reports, Bulletins Nos. 1, 2 and 3.



Untreated Rails———— **Titanium Treated**.....

Average difference between Maximum and Minimum Analysis in each Rail Section.

	Carbon	Phosphorus	Sulphur
Untreated Rails	.26	.015	.029
Titanium Treated	.08	.004	.007

Segregation in the untreated rails averages approximately four times that in the Titanium treated.

Physical and microscopic tests reported in our bulletins conculsively prove the superiority of the treated steels due to their comparative cleanness and freedom from segregation.

IF EXCESSIVE SEGREGATION IN OPEN HEARTH RAIL STEEL IS DANGEROUS THE PROPER USE OF FERRO CARBON-TITANIUM IS IMPERATIVE.

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents. Process and Products Patented.

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Pittsburgh: Oliver Building

Pacific Coast Agents:
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Los Angeles San Francisco Portland

TPC
Reg. U. S. Pat. Off.
TRADE MARK.

Chicago: People's Gas Building
The Primos Chemical Company
Primos, Pa.

GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Sheffield, England

What Do You Really *Know* About The Simmen System of Signaling

Did you ever talk about it to any responsible official of any of the high-speed interurban roads using the Simmen System?

Did you ever ride on a car protected by this System? And see the cab signal constantly staring the motorman in the face—see it change from green to red and back to green again?

Have you ever sat at a Simmen Dispatcher's Table and watched the automatic recording of the movements of every train? Seen the dispatcher stop a train at a given point by simply pushing a lever?

Have you ever examined the interlocking feature on the dispatcher's levers which prevents him from giving clear signals to opposing trains?

Have you ever had definite authoritative figures on the cost of installation and operation of the Simmen System?

How can you judge of the value of the Simmen System without thoroughly investigating its workings and cost?

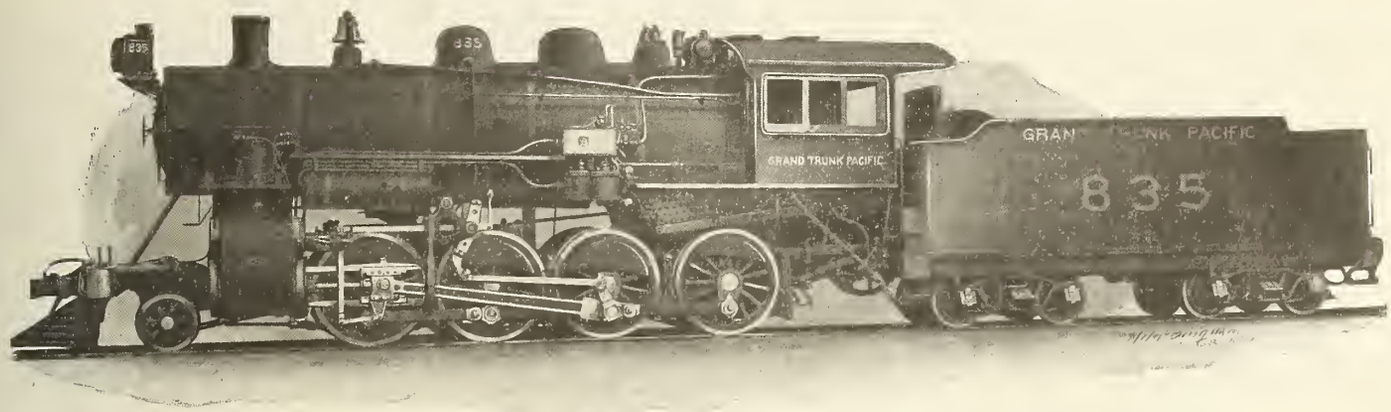
You can make such an investigation easily and conveniently. Do it.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

Canadian Locomotives

for contractors, industrial works, railroads, etc.



CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 10 tons. Weight of tender in working order 150,000 lbs.

All locomotives are equipped complete with fittings, fixtures, tools and all appliances necessary for their operation.

If desired, we will furnish with all tenders on standard locomotives, complete detailed specifications, fully describing all construction features, with the various sizes of dimensions noted. Specifications can also be accompanied by photographs showing the type of locomotive proposed, with any modifications clearly mentioned.

We have had a half century's experience which may be useful to intending purchasers in selecting locomotives suitable for peculiar conditions, or where roads are not fully completed or surveyed.

Our plant is now being greatly enlarged. New equipment has been installed and the capacity of the works brought up to an output of about eighteen locomotives a month, which will soon be increased to twenty-five a month. Consult us before purchasing a locomotive!

We are also builders of stationary boilers suitable for contractors or industrial plants.

Canadian Locomotive Company, Limited

Kingston - Ontario - Canada

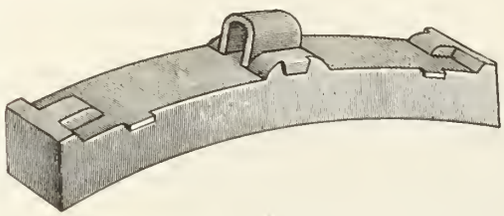
Grey Iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

KEEP STANDING
LAST ADVERTISEMENT.

Our Improved Reinforced

BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.

25 - ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35 - ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

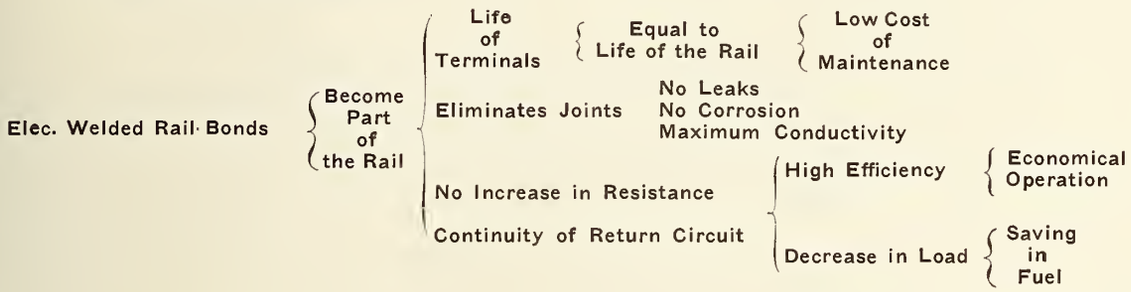
Canadian Brakeshoe Company, Limited

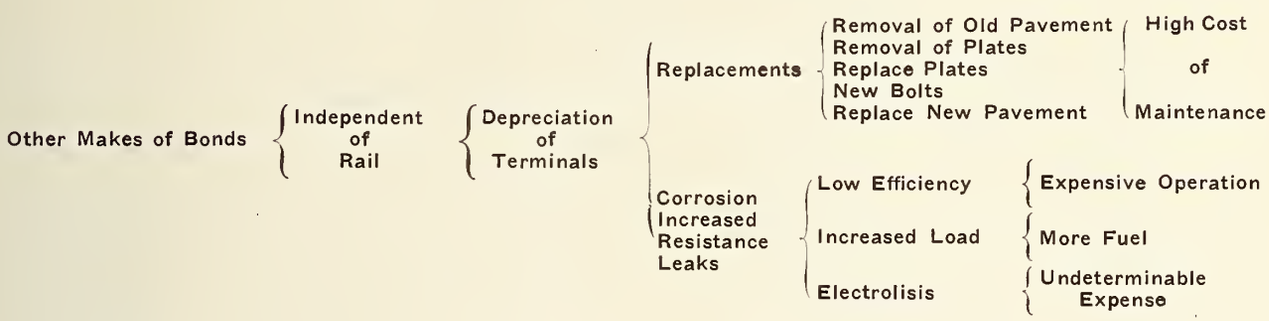
Sherbrooke, Que.

Sole representatives for the sale of our Brakeshoes In the Dominion of Canada outside British Columbia, Messrs. Taylor & Arnold, Montreal and Winnipeg. The Province of British Columbia, The B. C. Equipment Co., Vancouver.

One Way to Establish FACTS is By Comparison

For Example:





HENCE

By Comparison is Established the FACT That ELECTRIC WELD RAIL BONDS ARE THE BEST

"FACTS ARE AS TRUTHFUL AS FIGURES"

There is a Way to Prove This. We Know the Way, so Should You

Write Us

The Electric Railway Improvement Co.

Cleveland, Ohio

Warm Days --- Cool Nights

OCEAN

RIVER

NOVA SCOTIA

NEW BRUNSWICK

PRINCE EDWARD ISLAND

QUEBEC

Boating
Bathing
Yachting
Fishing
Tennis
Golf

Every Summer Enjoyment

LAKE

Are described in a beautifully illustrated book of 300 pages.

STREAM

"Summer Provinces By The Sea"

Send 15c in stamps to
General Passenger Agent,
Canadian Government Railways,
Moncton, New Brunswick.

EDISON BSCO

PRIMARY BATTERY

FOR TRACK CIRCUITS

KILL
LAST AD.

The Standard Closed Circuit Cell

RSA Cell, 400 Ampere Hours Capacity.

Service tests have conclusively demonstrated that the replacement of gravity with the Edison-Bsco Cells means more economical and dependable track circuit operation. It is a case of short life with fluctuating voltage requiring frequent attention against high capacity, uniform voltage, and attention only at infrequent renewal periods

The chemical action of the gravity cell causes the formation of a scale on the zincs which tends to lower the voltage. This corroding of the zincs develops more rapidly when the cell is discharging at high rates, thus tending toward failure in wet weather when the increased leakage results in a heavy flow from the battery.

When Edison Cells are used and the external resistance properly adjusted, the danger of the relay not getting sufficient current is very remote, since the capacity of the battery is such that, no matter what the condition of the track, it is practically impossible to discharge the cells at a rate high enough to affect the voltage appreciably, and there is no internal action tending to decrease the efficiency of the cell, similar to that which is characteristic of the gravity.

These are a few of the reasons for the success of the Edison-Bsco Cell in track service. The matter is covered very thoroughly in our booklet 2603, a copy of which may be had for the asking.

RSA Barrel Shaped Cell, 400 Ampere Hours Capacity.

The Cheapest Form of Battery Energy

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

Canadian Consolidated Rubber Co.

LIMITED

KILL
LAST AD.

Executive Offices: Notre Dame St., Montreal, P.Q.

Selling Agents for

Dominion Tire Co., Limited, Berlin, Ont.
The Canadian Rubber Co. of Montreal, Limited, Montreal, Que.
The Granby Rubber Co., Limited, Granby, P.Q.
The Merchants Rubber Co., Limited, Berlin, Ont.
The Berlin Rubber Manufacturing Co., Limited, Berlin, Ont.
The Maple Leaf Rubber Co., Limited, Port Dalhousie, Ont.
Dominion Rubber Co., Limited, St. Jerome, P.Q.
Berlin Felt Boot Co., Limited, Berlin, Ont.

Rubber Goods BEST BY TEST For All Purposes

Air Brake Hose (regular) and special "Non-freezing" Air Signal Hose.
Steam Heating Hose.
Vacuum Hose.
Hot Water Hose (White).
Cold Water Hose.
Air Hose—For Drills and Pneumatic Tools.
Hose Bags—Corrugated.
Heavy Suction Hose.
Wire-lined Gas Hose.
Fire Hose and Supplies.
Hose for every Special Use.

"Star" Red Sheet Packing.
"Canadian" Spiral Packing.
Pure Gum Sheet.
Valves—For Hot and Cold Water (All densities for any pressure).
Pebbled (Dot) Rubber.
Moulded Mats.
Hammer Bumpers.
Air Brake Gaskets.
Special Moulded Goods for every Mechanical Use.
Tubing—all sizes.
Rubber Strips.

RUBBER BOOTS AND SHOES, "Jacques Cartier," "Merchants," "Dominion," "Anchor," Brands.
Fleet Foot Outing and Sporting Shoes.
Felt Boots and Specialties, "Berlin" Brand.
Automobile Tires. Truck Tires. Carriage Tires.

Original "Diamond" design Inlaid Rubber Tiling. Estimates and Samples cheerfully furnished. We specialize in Rubber Goods required by Steamboat and Electrical Car Companies.

Write for Catalogues and Prices.

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Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

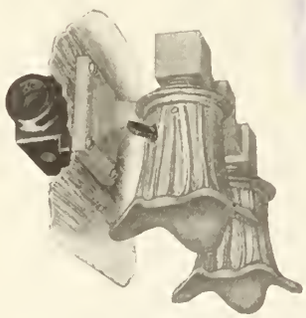
Railway Condulets

Type LOC
With Reflector Holder and Socket CRSEI.

Tpye DSOC
Takes Various Round Base Fittings.

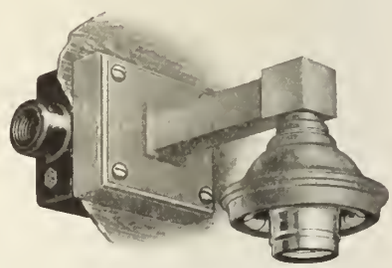
Type BLMC
Takes Various Round Base Fittings.

Type DSPA
With Receptacle and Receptacle Mounting Plate.



Type KRY
With one of Various Fittings it will Take.

Single Outlet Yard charging Condulet for Underground Conduit System—Type UGC Condulet used as Base.



Type KRR
With one of Various Fittings it will Take.

Type JRRH Hood
For use on Type KRY with Round Base Fittings.

Type BRHS
With 100 Ampere Receptacle and Plug-Battery Charging Equipment for Cars.

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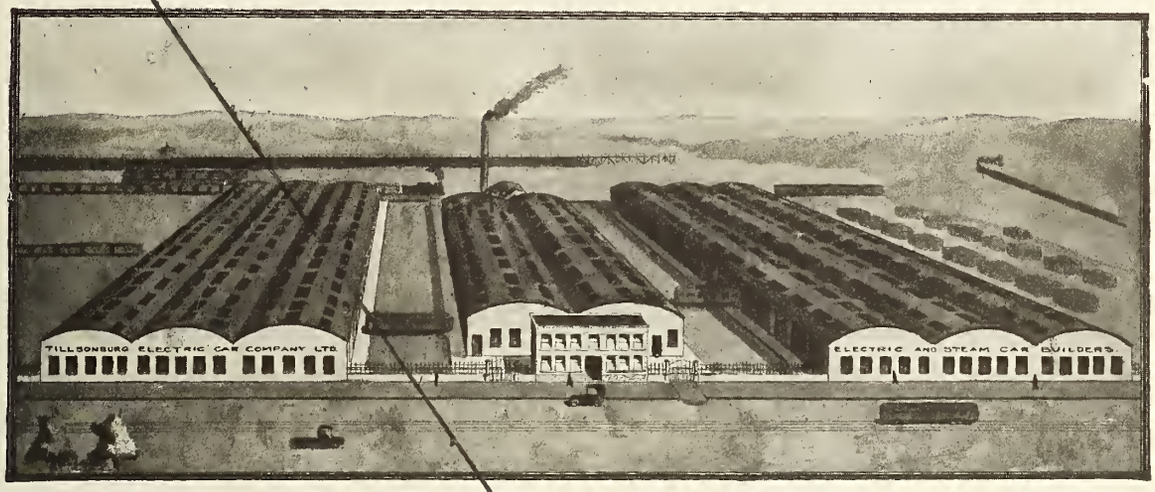

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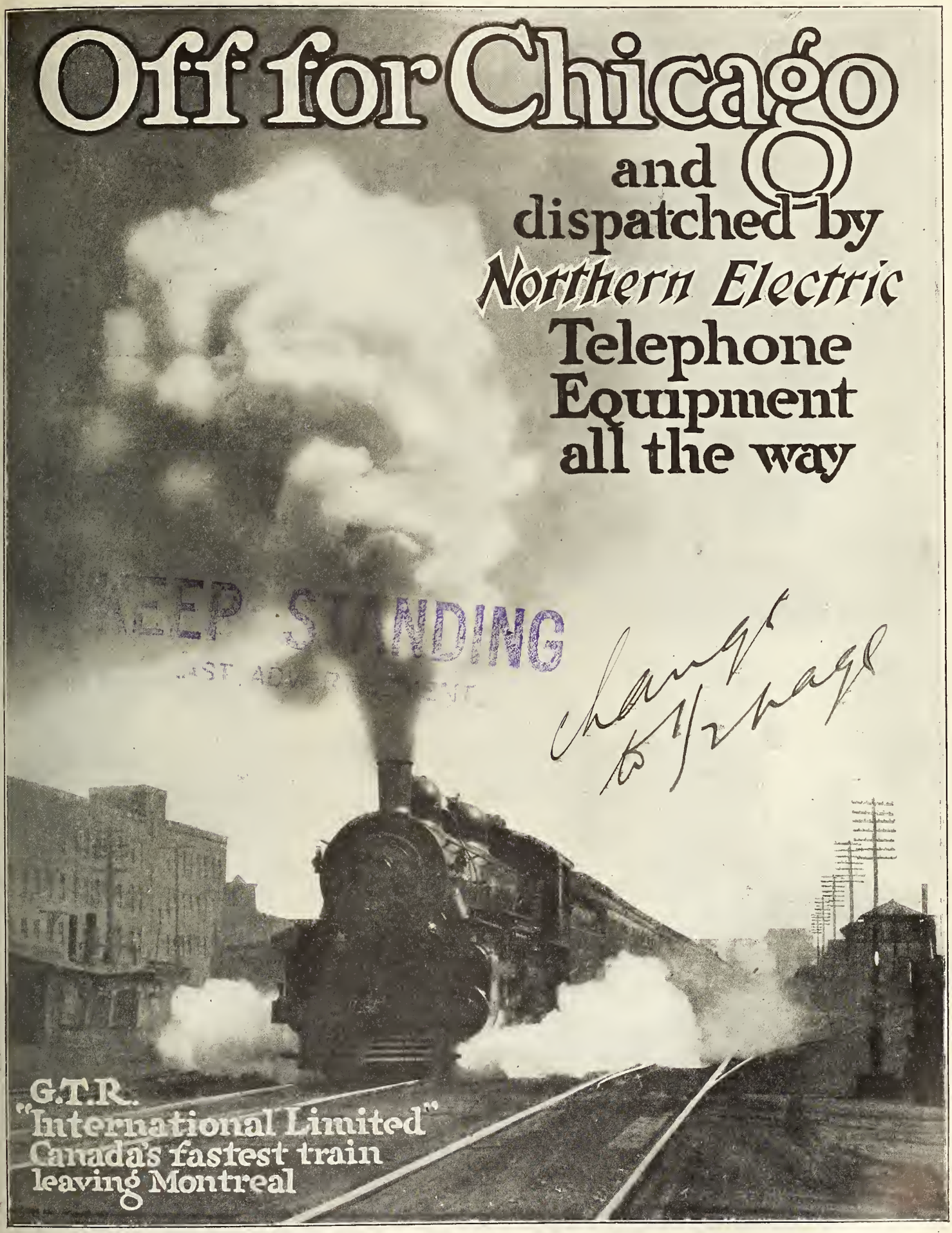
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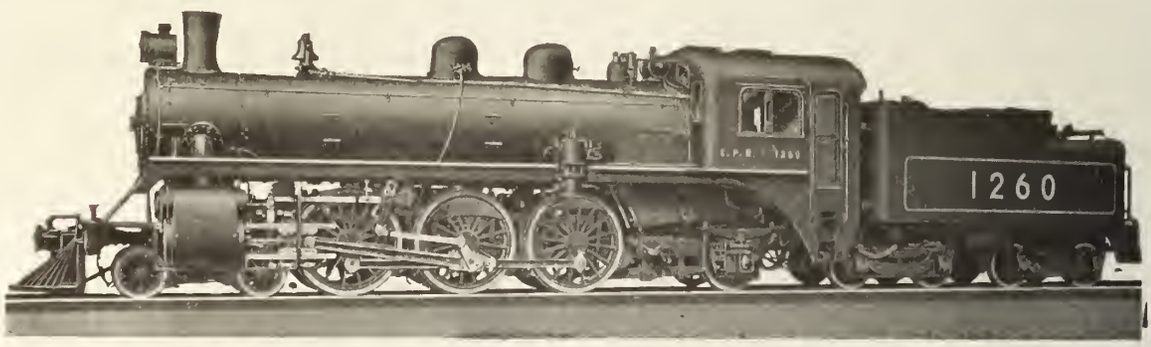

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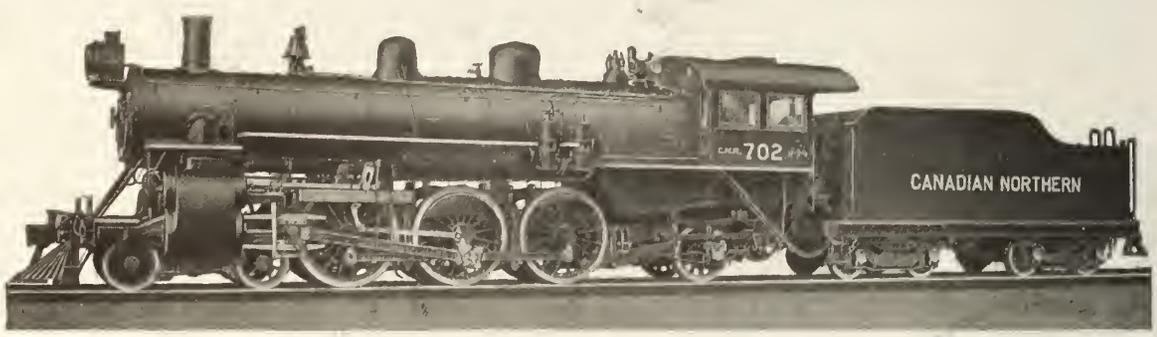
Total Weight of Engine, 223,000 pounds; Weight on Drivers, 142,000 pounds; Diameter of Drivers, 70 inches; Boiler Pressure, 200 pounds; Cylinders, 22½ x 28 inches; Maximum Tractive Power, 34,500 pounds.



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Total Weight of Engine, 216,000 pounds; Weight on Drivers, 136,400 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 170 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power, 31,100 pounds.

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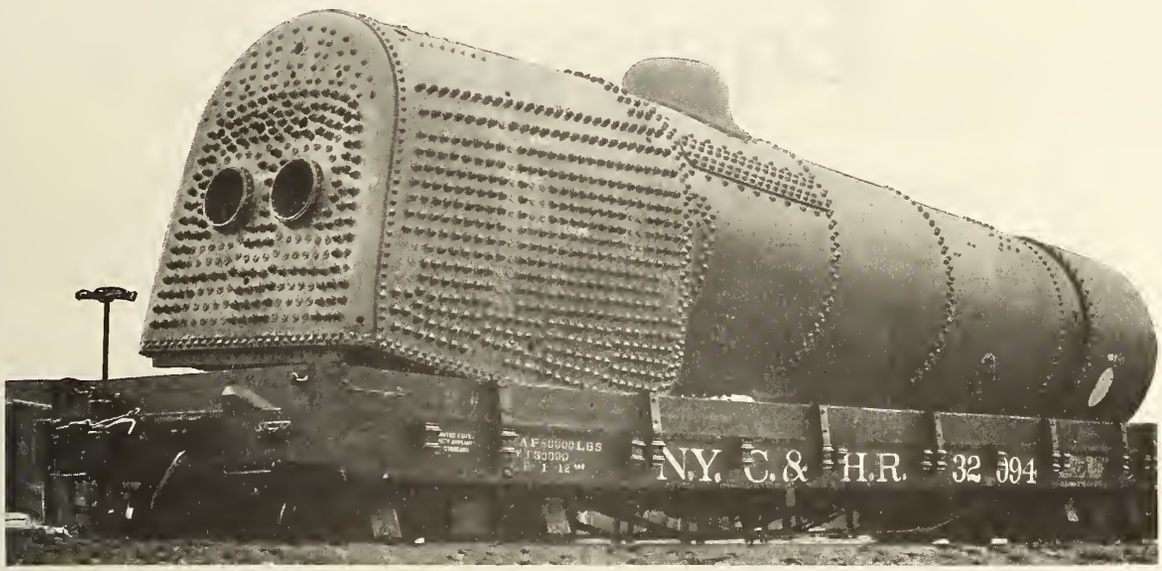

Typical Installation of Tate Flexible Stay Bolts.

CONDITIONS OF THE PAST are responsible for the improvements of to-day. The locomotive firebox presented problems and conditions that were demanding attention in order to safeguard the material assemblage and obtain not only greater efficiency in service, but likewise economical maintenance.

RIGIDITY OF FIRE BOX CONSTRUCTION presented a condition that was not at all satisfactory, in view of the frequent breakages of staybolts, cracking of fire sheets, etc., incidents that were demanding the closest consideration and investigation, so as to overcome same if possible.

AS A MEANS OF PROVIDING for the relative sheet expansion under less restriction, the Tate Flexible Stay Bolt, as a connecting member to stay fire box to outer shell, was brought to the attention of the mechanical departments of the railways in the year 1904, and there is now 12,000,000 Tate bolts in service.

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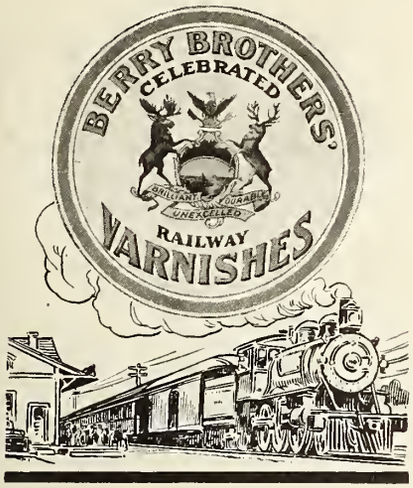

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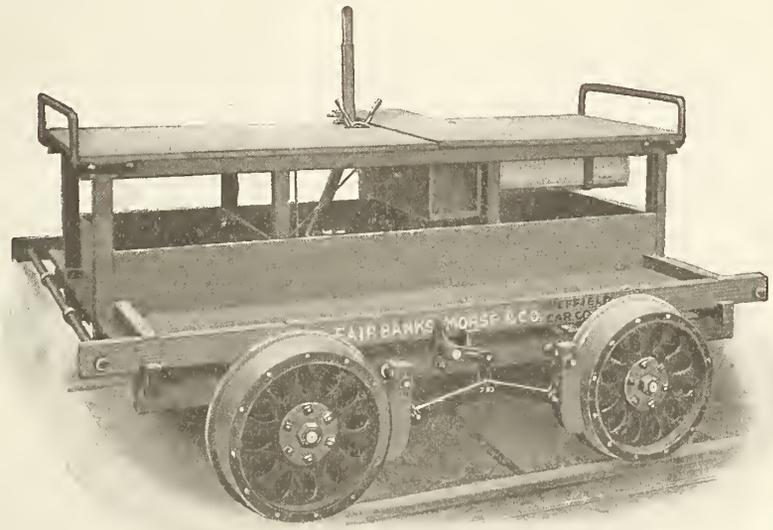

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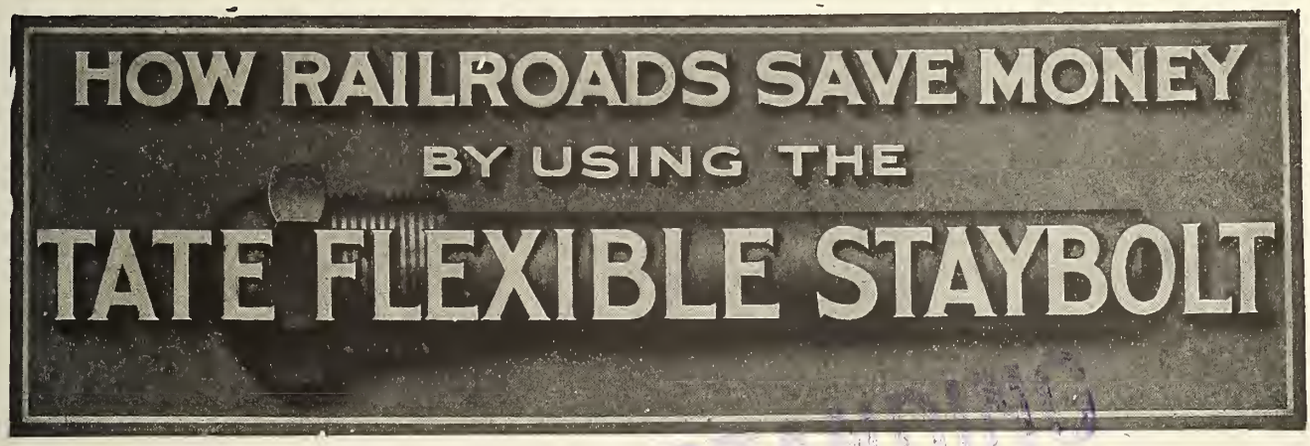

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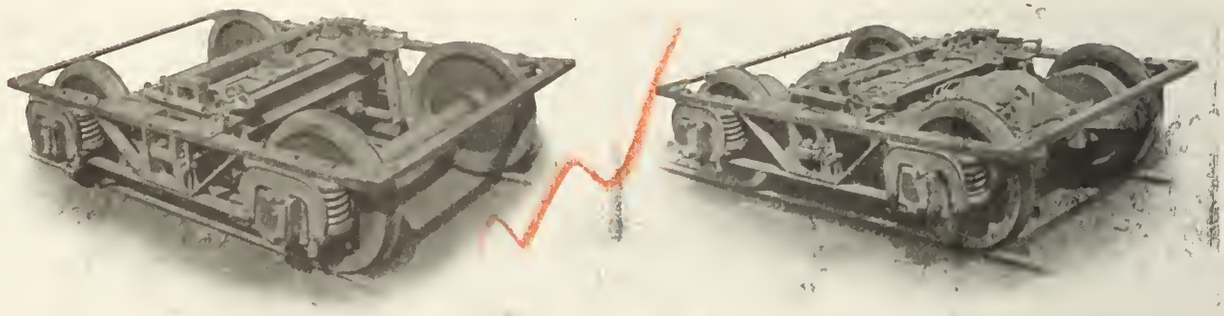
It's What You Cannot See That Counts In Car Construction

View of Superstructure Framing of High Speed Interurban Passenger Cars built for Montreal and Southern Counties Railway.



WITHOUT MOTORS WITH MOTORS

Views of High Speed Trucks Used on Interurban Passenger Cars built for Montreal and Southern Counties Railway.

After the sheathing, the paint and varnish is put on a car, the only way to find out whether that car is built right is to operate it. Wear and tear in operation over the modern high speed interurban road will soon show whether the framing is of the proper kind, and whether the trucks are designed right.

OUR REPUTATION IS BEHIND OUR METHOD OF INTERURBAN CAR CONSTRUCTION, AND THE TRUCKS WE BUILD WILL WITHSTAND THE HARDEST KIND OF SERVICE.

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Canadian Railway and Marine World

July, 1914.

The June Railway Mechanical Conventions at Atlantic City.

The two great railway conventions of the year, the Master Car Builders' Association, and tbe American Railway Master Mechanics' Association, were held in Atlantic City, N. J., tbe former on June 10 to 12, and the latter on June 15 to 17. The most important features of these annual conventions are the reports of the standing and special committees and the individual papers presented, the principal ones of which are given on this and following pages, in full or in abstract.

Report of Committee on the Retirement of 40,000 and 50,000 lbs. Capacity Cars From Interchange Service.

The Master Car Builders' committee, D. F. Crawford, General Superintendent of Motive Power, Pennsylvania Rd., Lines West, chairman, reported as follows:—

At the convention in June, 1913, the question of the retirement of cars of 40,000 and 50,000 lbs. capacity from interchange service was considered and a committee was appointed to consider the question in all of its phases. In the discussion, both in the convention and by the committee, it seemed desirable to give consideration to some of the principal features of the construction of the cars, as well as the marked capacity.

The committee addressed to the members four queries, as given below. Members were also to advise as to the number of cars of the various capacities and several constructions operating on their lines. The following is a summary of the answers received:—

Question 1. Have you any restrictions in force regarding the use of cars of 40,000 and 50,000 lbs. capacity? 84 answered no; 13, yes; 2, yes for 40,000 and no for 50,000; 1, yes for 40,000 only; and 30 gave no replies.

Question 2. Do you accept in interchange cars of 40,000 and 50,000 lbs. capacity? If so, is the lading transferred? 4 answered no; 85, yes; 1 no for 40,000 and yes for 50,000; 1, should be accepted; 3, yes, lading transferred; 3, yes, depending on condition of car; 1, no, lading transferred and charged to us; and 32 gave no replies.

Question 3. Do you regard it practicable to prohibit the use of cars of 40,000 lbs. capacity in interchange? 20 answered no; 62, yes; 2, yes, with sufficient time limit; 2, not at present; 3, yes, depending on construction; 1, consider construction of car; and 40 gave no replies.

Question 4. Do you regard it practicable to prohibit the use of cars of 50,000 lbs. capacity in interchange? 30 answered no; 48, yes; 2, yes, in reasonable time; 3, not at present; 3, yes, depending on construction; 2, in reasonable time; 1, yes, for 40,000; 1, consider construction of car; 1, yes, unless cars are equipped with steel underframe or its equivalent and an all metal truck; and 39 gave no replies.

Of the 138 lines submitting data, the number of cars in revenue service on Jan. 1, 1914, of tbe several classes, is as follows:—

40,000 lbs. capacity or less: all steel, 8; metal draft arms, 215; wooden draft timbers extending through body bolsters, 29,122; wooden draft timbers extending to body bolsters, 20,522; grand total, 49,867. Of these, 29,727 have metal body bolsters, and 6,359 American continuous draft gear.

50,000 lbs. capacity and less, but over 40,000 lbs.: steel underframe, 50; steel centre sills, 89; metal draft arms, 11,197; wooden draft timbers extending through body bolsters, 31,413; wooden draft timbers extending to body bolsters, 12,875; grand total, 55,624. Of these, 37,712 have metal body bolsters and 2,796 American continuous draft gear.

Over 50,000 lbs. and less than 60,000: all steel, 161; steel underframe, 492; steel centre sills, 2,217; metal draft arms, 9,192; wooden draft timbers extending through body bolsters, 1,746; wooden draft timbers extending to body bolsters, 5,515; grand total, 19,323. Of these, 17,188 have metal body bolsters, and 23, American continuous draft gear.

60,000 lbs. capacity: all steel, 445; steel underframe, 98,674; steel centre sills, 34,317; metal draft arms, 110,835; wooden draft timbers extending through body bolsters, 166,614; wooden draft timbers extending to body bolsters, 227,881; grand total, 638,766. Of these, 428,758 have metal body bolsters, and 29,617, American continuous draft gear.

The committee recommends that the following proposed rule be submitted to special letter ballot, so that it may, if approved, be embodied in the Rules of Interchange effective Oct. 1, 1914: "After Oct. 1, 1916, all cars of less than 60,000 lbs. capacity, having wooden or metal draft arms which do not extend beyond the body bolster, will not be accepted in interchange."

Report of Standing Committee on Car Wheels.

The Master Car Builders' Committee, W. C. A. Henry, Superintendent of Motive Power, Pennsylvania Rd., chairman, and of which R. W. Burnett, General Master Car Builder, C.P.R., is a member, reported in part as follows:

This subject originated with the Association of Manufacturers of Chilled Car Wheels, and from whom have been received a number of recommendations in the direction of heavier flanges. There is not sufficient available data on the latest design of chilled car wheel to warrant making any recommendations. To increase to any extent the width of flange will involve providing more clearance through frogs, guard rails and railway crossings. The Bureau of Standards of the Department of Commerce, U. S. A., is preparing to make an experimental study of chilled car wheels, which will include foundry practice, investigation into the chemistry, metallurgy and mechanics of wheels, etc., and we are informed that it is their intention to ask tbe wheel manufacturers and wheel users to co-operate in this investigation.

In order to provide means for measuring flat spots of 1 and 2 ins. long on passenger and freight car wheels respectively, it is recommended that two additional notches be provided on the upper edge of the present standard wheel defect gauge.

Errors were made in the revision of the specifications for wheels in 1913. Under markings substitute "outside" for "inside," which is in accordance with previous practice. Under thermal test 2 mins. after pouring ceases, an examination must be made, and if the wheel is found broken in pieces, or if any cracks in the plate extend through or into the tread, all wheels of the same tapen size as the wheel broken will be rejected.

Under "branding," the name or brand of the manufacturer, date and serial number, shall be legibly stamped on each wheel; also purchaser's name and serial number, if specified. The tape size shall be legibly marked on each wheel.

The maximum gross weight to be carried by car wheels of 625 lb. weight is not in harmony with the specifications, and shall be corrected to specify a maximum gross weight not to exceed 95,000 lbs.

Physical test for rolled and forged steel wheels is still under investigation. At present, there are three diameters of solid steel wheels specified as recommended practice, 33, 36 and 38 ins., whereas for steel tired wheels there is but one diameter, 33 in. It would seem consistent that we have the same diameters for the steel tired as for the solid wheel.

The Association now has as recommended practice a tire 2½ in. thick, requiring three diameters of wheel centres, namely 28, 31 and 33 ins. To standardize the mounting of tire, wheel centres should be machined to the exact diameter specified, and the tires finish bored to the diameter of the centre less 1-1000 in. for each inch in diameter.

To conform more nearly to the outlines of flanges of maximum thickness the radius with which the gauging point at the throat is struck should be changed from ⅝ to 1 15-16 in. Also ⅝ in. radius for minimum flange thickness gauge to be changed to 1 13-16 in.

Report of Committee on Interline Loading of Commodities.

The Master Car Builders' committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., chairman, reported as follows:

The establishment of a uniform code of rules for the interline loading of commodities, a subject referred to your committee for investigation, was received rather late in the year; indeed too late to permit the research it evidently requires. Hence your committee is only able at this time to offer a report of progress, with the assurance that an effort is being made to ascertain what seems to be necessary to satisfactorily meet the requirements.

Your committee frankly confesses it does not yet have a very clear conception of what is embraced in the question; at the same time it appreciates that there does not seem to be any doubt that a higher officiency may be assured, and less loss experienced by more securely loading and packing commodities handled in interline shipments. What migbt be accomplished in tbat direction, however, is as yet uncertain.

Due to the short time your committee has had the subject in hand, opportunity has been lacking to secure information of any

particular interest. Furthermore, it has not been able to confer with the subcommittee of the American Railway Association on marking, packing and handling of freight, nor with the patron of the suggestion, in conference with whom it is believed a better plan of investigation and course of procedure may be outlined. It is, therefore, the intention of your committee to go into this matter carefully during the coming year.

Report of Committee on Car Construction.

The Master Car Builders' Committee, W. F. Keisel, Jr., Assistant Mechanical Engineer, Pennsylvania Rd., chairman, and of which H. H. Vaughan, Assistant to Vice President, C. P. R., is a member, reported in part as follows:

CENTRE SILLS FOR EXISTING CARS.—To the Arbitration Committee, the following amendment to rule 43 is recommended: "Existing steel or steel underframe cars, which have less strength than specified below, should be classified with wooden cars, and subject to the same rules for combination defects. Area of centre sills not less than 16 sq. in. Ratio of stress to end load not more than 0.09. The length of centre or draft sill members between braces to be not more than 20 d, where d is the depth of the member, measured iu the directiou in which buckling might take place."

To explain the above we would state that the basis of strength in rule given above is threefold. 1, a minimum section area of centre or draft sills; 2, maximum ratio of stress to strain, and, 3, maximum ratio of length to depth of unsupported members of underframe. The section area given should obtain throughout the length of the sills lying between points where impact takes place. If impact takes place hetween the coupler horn and end sill, the full leugth of the centre sills must be considered. If, on the other hand, impact takes place between rear followers, the part of centre sills between these followers should be considered, and the centre sills from the rear followers to the end sill may be lighter. The rivet area holding the back follower stops to the center sills should not be less than 12 sq. ins.

"In determining the ratio of stress to end strain, the distance between the neutral axis of any member of the car and the centre line of strain should be taken as a lever arm, through which bending effect is added to direct tension or compression. A formula for the ratio of stress to end strain is $\frac{1}{A}$ plus $\frac{X}{SM}$, in which A represents area in sq. ins., X represents lever arm in ins., and SM represents section modulus of section.

"The length of centre or draft sill between adjacent tie plates or braces, or the length of any part of any centre sill or draft sill between adjacent supports or braces, must not be more than 20 times the measurement across the section of member under consideration. The measurement across the section referred to must be taken whichever way the member is weaker, which, of course, will be the direction in which the member will buckle if overstrained. As an example: Centre sills consisting of channels tied only at the top by floor plates, and having flanges 2½ ins. wide, may have the bottom flanges braced only at intervals of 8 ft. According to the rule given above, these bottom flanges should have braces at intervals of not more than 20 times 2½ ins., or 50 ins. Such car will, therefore, require an additional brace for anchorage about half way between the existing anchorages."

CENTRE SILLS FOR NEW CARS.—To furnish maximum revenue returns, the money expended for first cost, repairs, and dead weight hauled should be a minimum. It was suggested that two standards for centre sill area be adopted—one for cars in general service, and one for heavy service; but as both kinds will be hauled in the same trains, this is not practical. Minimum centre sill areas, between points of impact, on existing cars, may vary up to 55 sq. ins. Service experience demonstrates that the cars having minimum centre sill strength are crippled in acting as cushions for the stronger cars. This makes it desirable to aim at uniformity of centre sill strength for all cars in the train. Designs of cars which do not go into general service in interchange may be considered only from their own load carrying standpoint, without regard to train strains; but those used in interchange must be considered from both standpoints. For the latter, your committee recommends the following as minimum design requirements to produce cars giving maximum returns for money expended: Area of centre sills: 24 sq. ins., min. Ratio of stress to end load: 0.06, max. Length of centre or draft sill members between braces: 20 d, max., where d is the depth of the member, measured in the direction in which buckling might take place.

BOX CAR END, DESIGN AND STRENGTH.—When existing box car ends need renewal they should be reinforced between corner posts with the equivalent of two steel braces, each having a section modulus of 4, or more. These braces may be applied vertically, horizontally or diagonally. New cars should have steel plate ends ¼ in. thick, reinforced between corner posts with the equivalent of either two vertical steel braces with a total section modulus of not less than 9; or one vertical and two diagonal steel braces with a total sectiou modulus of not less than 10; or three horizontal steel braces with a total section modulus not less than 10. New cars may have the following alternative arrangement: Three or more steel braces, two of which run diagonally, with a total section modulus of not less than 12½, and wood lining 1¾ in. thick. To concentrate strength at a point near floor line on the vertical centre line of car, diagonal braces should extend from the centre sills to the side plates, and not from the bottom corner to the ridge. The attachments for the braces and the members to which they are attached must be sufficiently strong to realize the full strength of the braces. Hardwood or yellow pine may be considered equivalent to the steel members, if the section modulus is four times as great. Wooden posts and braces should be set in metal pockets not less than 1½ in. deep, and must be held in place by adequate tie rods. Lining at car ends should be supported at intervals not greater than 30 times the thickness.

Two 4 by 3 in. Z bars, 12.4 lb. per ft., have a total section modulus of 9.34; two 5 in. I beams, 9.75 lb. per ft., 9.6; three 4 in. I beams, 9.5 lb. per ft., 10.2; and three 3 in. Z bars, 14.2 lb. per ft., 10.3.

Types of end similar to VanDorn ends, made of ¼ in. plate, or Murphy ends, with the lower half made of ¼ in. corrugated plate, and the upper half with 3-16 in. corrugated plate, may be substituted for those described.

CAR DOORS AND FASTENINGS.—Attention has been directed to non-uniformity of doors and fastenings, and ease with which some cars can be entered without breaking the seal. It was also stated that if car is equipped with a board roof only, this is partly removed and afterward replaced, and should there be a tin roof underneath, this is cut and bent back sufficiently for a man to enter. After pilferage is committed he returns through the opening, replaces the metal and boards, and an ordinary inspection does not detect how entrance was effected. Attention has also been directed to the large percentage of defective doors, which have to be cleated to hold them in proper position.

Your committee feels that one of the most important parts of the car door proposition, at present, is to reinforce the doors and door fastenings on some existing box cars in the least expensive manner that will make them safe and serviceable. In many cases this does not require new doors, but only additional fittings or reinforcements. For this reason it is thought advisable to make one recommendation to cover the betterment of existing construction, and another to cover all new construction. On account of the patent situation, your committee does not feel that it is feasible to present full detailed designs of doors and fastenings without eliminating some of the best known construction, and, therefore, prefers to present its recommendations in specification form, as follows:

Specifications for reinforcing existing doors:—The necessary additional number of bottom door guides should be provided to make four on each side of the car—one adjacent to each door post, one in the middle of the doorway, and the other between the back door post and the open door stop, located approximately as shown in the illustration, and similar in design, with particular reference to the height of lip, which should be 1¾ in. If the design of the door is such that the removal of the door guide next to the door post would permit the door to be pulled away from the car, then this door guide should be of such design that it cannot be removed when the door is closed.

Doors should be reinforced against bulging by the equivalent of two 1½ by 1½ by 3-16 in. angles extending horizontally the full width of the door, one located approximately 12 ins. from the top of the door, and the other approximately 12 ins. from the bottom of the door, and fastened with ⅜ in. carriage bolts.

The door hasp fastener should be at least 24 ins. long, fastened with not less than five ⅜ in. bolts with the nuts on the inside of the door. The door hasp fastener should be of such design that the hasp cannot be removed without removing the bolts from the fastener.

The closed door stop should have two or more lips extending at least 1½ in. over the door to support the door against bulging outward. Where all wood closed door stops are used, they should be strengthened against splitting, and should have at least two metal reinforcing brackets similar to closed door stop casting shown in the illustration.

Open door stops, if of wood, should extend the full height of the door and be strengthened against splitting.

SPECIFICATIONS FOR COMPLETE new doors for existing cars or for new construction.—The upper door track should be continuous, and strong enough so that it will not sag, securely fastened to the car with ½ in. bolts, or ⅜ in. rivets not less than six in number, and so designed that it will continuously support the door against outward pressure independent of any action of the door hangers, and will also keep out rain and snow, proper flashing, if necessary, to be provided over the door track. The design of track and hangers should be such that when the door is being opened or closed it cannot lift up and bind against the track.

Bottom door guides to have 1¾ in. lip, and to be four in number—one located adjacent to each door post, one in the middle of the doorway, and one between the back door post and the open door stop, located approximately as shown in the illustration, and similar in design, with particular reference to the height of lip, which should be 1¾ in. If the design of the door is such that the removal of the door guide next to the open door post would permit the door to be pulled away from the car, then this door guide should be of such design that it cannot be removed when the door is closed.

Metal open door stops are recommended, one or more in number, of design shown in the illustration, securely bolted to the framing of the car with ½ in. bolts. If wood open door stop is used, it should extend the entire height of the door and be strengthened against splitting.

The back edge of the door and the back door post should be so constructed that when the door is closed and fastened it will be continuously supported from top to bottom against outward pressure, and will also be protected against leakage of rain or snow and admission of sparks.

Closed door stop to be preferably of metal, and to provide protection against leakage of rain or snow and admission of sparks. The closed door stop must also support the door against outward pressure, either continuously from top to bottom, or by the use of two or more lips projecting at least 1½ in. over the door, approximately as shown in the illustration. If wooden closed door stops are used, they must be strengthened against splitting and must be provided with at least two metal closed door stops provided with lips to project over the door at least 1½ in. to support the door against bulging outward, as shown in the illustration.

Wood doors should have preferably a metal frame, with a Z bar or its equivalent at the bottom, approximately as shown in the illustration, the Z bar acting as a stiffener and also engaging with the bottom door guides. This construction or its equivalent permits the use of door guides which project a very short distance from the side of the car, and are, therefore, less subject to injury, particularly the door guide at the middle of the doorway.

Wooden frame doors, if used, should be at least as strong as that shown in the illustration.

The door hasp fastener should be at least 24 ins. long, fastened with not less than five ⅜ in. bolts, with nuts on the inside of the door. The door hasp fastener should be of such design that the hasp cannot be removed without removing the bolts from the fastener.

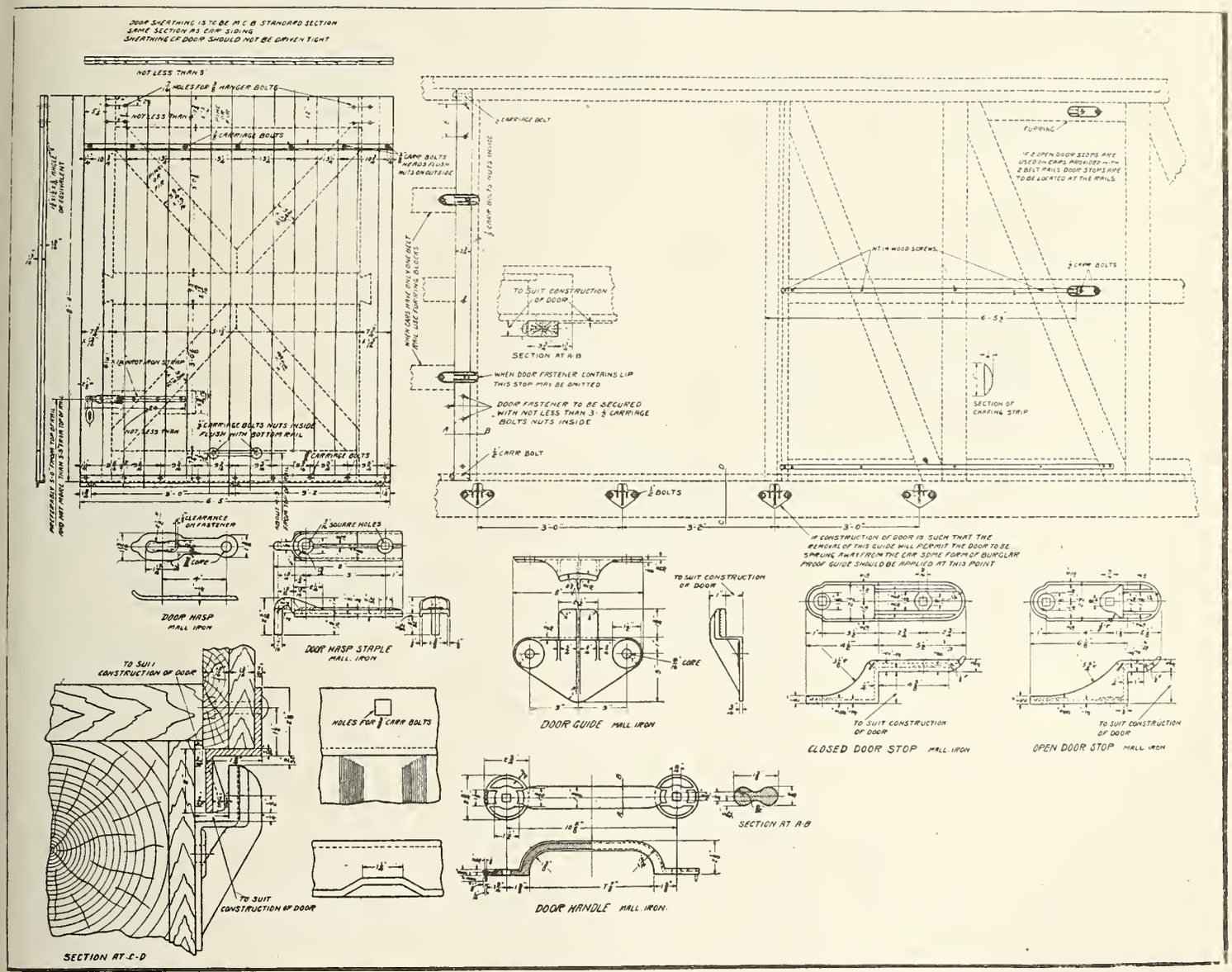
Door hanger bolts to be located not closer together than 4 ins. one way, and 5 ins. the other. Four ⅜ in. bolts are recommended

It is understood that all of the above recommendations apply particularly to 6 ft. door openings of cars with single, outside hung side doors, and in all cases where a particular construction is described or specific dimensions are given, their equivalents will be acceptable.

The changes of the proposed revision of sheet M. C. B. 30 are all shown in the accompanying illustration, and are as follows:

GENERAL DRAWING OF DOOR.—Construction of door has been changed to show stiles extending full height of door. Four holes for door hanger bolts instead of three. 7-16 in. holes for door hanger bolts instead of 9-16 in. Horizontal spacing of door hanger bolts from 6 in. centres to not less than 5 ins. Vertical spacing of door hanger bolts from 4 ins. to not less than 4 ins. Size of door stiffener angle from 1¼ by 1¼ by 3-16 in. to 1½ by 1½ by 3-16 in. The three no. 14 wood screws in centre of door stiffener angle changed to ⅜ in. carriage bolts. 3-16 by 1½ in. wrought iron strap added to door hasp fastener. ½ in. carriage bolt added to top and bottom of wooden closed door stop to prevent splitting.

Note reading, "When door fastener contains lip, this stop may be omitted," added



Car Door Construction, Revised Sheet M.C.B. 30.

for lower malleahle iron closed door stop.

Dimension 2 ins., showing thickness of closed door stop, and dimension ¼ in., showing the amount the floor projects heyond the sheathing, hoth changed to "to suit construction of door."

Note reading, "There must be not less than two hottom door-guide hrackets supporting the door in any position, and not less than three hottom door guide brackets supporting the door in the closed position," removed.

Note reading, "When cars are provided with two helt rails, door stops are to he located at the rails," changed to read, "If two open door stops are used on cars provided with two helt rails, door stops are to be located at the rails."

Note reading, "If construction of door is such that the removal of this guide will permit the door to he sprung away from the car, some form of hurglar proof guide should he applied at this point," added to the third bottom door guide from closed door stop.

Furring for door hasp staple fastener added.

Section C-D.—Dimension of ¼ in., showing the amount the floor projects beyond the sheathing, changed to "To suit construction of door."

Length of hottom vertical flange of Z har door stiffener changed from 1¼ in. to 2 ins.

Dimension of 1 1-16 in., showing distance from face of car to lip of door guide, changed to "To suit construction of door."

Round holes in top flange of Z har door stiffener changed to square.

Door Guide.—Height of lip changed from 1 in. to 1¾ in.

Dimension of 1 1-16 in. from hack of guide to inside of lip changed to "To suit construction of door."

Dowel omitted from door guide.

Design of lip changed from 1¾ in. radius to square top with ¼ in. radius at each corner.

Distance from centre of holt hole to bottom of guide changed from 2 ins. to 3 ins.

Closed Door Stop.—Dimension of 2 ins. from hack stop to lip changed to "To suit construction of door."

Open Door Stop.—Dimension of 2 ins. from back of stop to lip changed to "To suit construction of door.

Door Hasp Staple.—Design changed so that staple will fit over 3-16 by 1½ in. staple fastener. Numher of holts reduced from four to two, and staple extended.

PLACARD BOARDS FOR BOX CARS.—As many hox cars recently huilt have steel ends, and some have complete steel sheathing, it hecomes necessary to provide placard boards for the various kinds of cards used, including cards for explosive shipments. Your committee recommends that the space available for placards should he not less than 16 by 24 ins. on each end and each side of car. Box cars with sufficient space availahle on wood siding, or exposed lining, should have a rectangular space, painted black, on each side and each end. Other hox cars should he provided with placard hoards, made of soft wood, not less than 16 hy 24 hy 1 in., the vertical edge reinforced with metal protection, and the holts fastening the hoards to the car not less than six, passing through the metal reinforcing pieces, three through each. The hoards may he made of more than one piece, and should then he tongued and grooved. The distance from the floor line of car to hottom of board should not he less than 4½ ft. Routing card hoards, preferahly the same size as the placard hoards described, should he placed on the side of the car, as near as possible to the door seal.

DRAFT GEAR.—There are many failures due to weak draft gears, creating unnecessary delays, transfer of loads, excessive cost of repairs, accidents and wrecks. The situation in connection with wooden cars was described as serious. Your committee recommends that cars should not he accepted in interchange unless equipped with draft gears and attachments having strength or capacity equivalent to or greater than the following requirements:

The section area of draft timbers located underneath the centre sills must he not less than 32 sq. ins. Each draft timber must be not less than 4 ins. wide, nor less than 6 ins. deep, and must be held securely to the centre sills and end sills by not less than seven ⅞ in. holts, or six 1 in. holts. Draft timbers extending through or beyond the bolsters must be secured to the centre sills hy two or more additional holts. Draft gear yokes must be not less than 4 ins. hy 1 in., made of wrought iron or steel, and attached to the coupler side with not less than two 1⅛ in. rivets. Draft springs must have a capacity of at least 19,000 lhs.

Should cars require repairs to bring them up to these minimum requirements, the following recommendations are offered:

Draft timhers should hutt against the body holsters and shoulder against the end sills, both of which in turn should he well secured against shifting from either pulling or buffing strains. Draft gear stops should, whenever possihle, he gained into the draft timher or heeled on the end sills. Front and back draft gear stops may he made in one piece, or may he secured to a metal plate not less than 5-16 in. thick, or made separate. Each stop (counting two stops riveted to a 5-16 in. plate as one piece) must he secured to the draft sill hy not less than six ¾ in. bolts or their equivalent. The centre sills should he strengthened by the use of a filling or packing piece secured between the same, hutting against the end sill and extending heyond the body bolster toward the centre of the car, a distance at least as much as between the holster and end sill. The present M. C. B. coupler side clearance of 2½ ins. should also be provided.

STOCK CAR DOORS.—It was suggested that a design of door he suhmitted for recommended practice as a guide for application of such doors. Your committee has agreed that at present it would not be policy to introduce such design as recommended practice, but are of the opinion that it might be well to formulate some rules governing stock car door construction. The subject, however, is of such a nature that more time than that availahle before the June convention must he taken in order to properly formulate such rules.

Note.—In connection with the discussions at the various meetings held by your committee, the suggestion was made that the committee develop a box car design, not necessarily as recommended practice, but primarily as a guide for hox car construction, and as a hasis for door and other designs, which then can he made complete in detail, showing actual application to a car design. It was further suggested that if such car design be made complete in detail, incorporating recommended practice, it would be used hy some of the smaller roads who do not prefer to make designs of their own, thus tending toward a more uniform type of car for smaller roads.

Report of Committee on Locomotive Stokers.

The American Master Mechanics' committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Rd., chairman, reported as follows:

The development of the locomotive stoker continues, though nothing notahle has heen observed during the past year. In your committee's last report allusion was made to the apparently accepted utility of the device, and its adaptability to locomotive service. References, it will he recalled, were also made to the higher average steam pressures maintained, and especially toward the latter part of a division run, simplicity of operation, work performed, etc., together with the admission that where comparisons as against hand firing had heen made the stoker developed remarkable efficiency, consequently no attempt will he made to further elaborate upon such features. Suffice it to say, however, that your committee helieves most of the statements appearing in their last report have heen horne out in practice, according to such ohservations as the additional year has permitted. It is no doubt prohahle some erroneous conclusions have heen drawn with reference to the capacity of the stoker, relative fuel consumption and economy, before fully weighing all operating conditions in train service. A truer value of the stoker and its range of usefulness and efficiency seems to be fully comprehended hy those who have taken the time to make the necessary inquiries and investigation.

In your committee's last report an effort was made to give a comprehensive idea of the development of the locomotive stoker and the lines along which the inventors are apparently working. It was pointed out that the several types were in the main divided into two general classes, namely, the underfeed and the scatter or overfeed types. No attempt was made to venture an opinion as to which type was the hetter (regarding hoth as having their strong points, which had not prohahly been fully developed), and even now your committee does not wish to advance an opinion as to which type will in the end prevail.

Where reference has heen made to the use of run-of-mine coal in connection with the stoker, it should be understood that it generally means coal containing lumps not over 6 ins. in size, though, strictly speaking, it is coal as it comes from the mines. Anything larger than 6 ins. is apt to arch over the hopper, hut this feature, it is claimed, can, and is, being improved.

Remarkahle interest is heing manifested in the development of locomotive stokers, and while many of those in service are actually doing their work, the suhject is still in its infancy. Your committee wishes to again refer to the difficulties surrounding the designing of a machine to suit present locomotive construction; not so much on account of the work to be performed, hut the absence of choice as to arrangement, the ahsolute limitations of space, and the conditions under which such a machine must operate. It is believed that as time goes on, greater latitude will be given the designers, and consequently more will he accomplished, where it is preconceded that the stoker is to be a part of the locomotive. This should allow consideration being given to the working parts of the stoker along with the locomotive as a whole, and it is not improbahle that when the design for the stoker is given equal consideration the locomotive will he constructed in many of its details so as to better suit, or he better adapted to, a stoker than now ohtains where it is necessary to construct the stoker to suit existing designs.

THE STREET STOKER, which is of the scatter type, and a type having the greatest number in service (totaling 418, with some 82 on order), as now designed, handles

crushed or slack coal. Some of the earlier designs, however, were constructed to handle run-of-mine coal. A number of these stokers are still in operation on passenger locomotives on the Chesapeake and Ohio Ry. The tabulation shown as a part of this report is sufficient evidence that the locomotives so equipped are coming and going daily (many in pool service), performing the work expected of them, and the proper operation of the stokers with which the locomotives are equipped is left to the crews to which they are assigned. A better idea of the service and failures may be obtained from the tabulation.

CRAWFORD STOKER.—Beyond the continued improvement in detail parts, the Crawford underfeed stoker seems to be adhering closely to its original principle of construction. The record shows that there are at present 301 in service, all applied to locomotives on the Pensylvania Lines West of Pittsburg, except two on the Pennsylvania Lines East of Pittsburg. From all reports they are working satisfactorily. The machine, as previously described, handles run-of-mine coal, producing its best results using the higher volatile products. The report from the Pennsylvania Rd. is to the effect that they are closely observing the everyday performance of the stokers in service, so as to ascertain under which the highest efficiency is obtained, and incidentally are educating men to handle and control them to the best advantage.

THE HANNA STOKER is another of the scatter type, but handles run-of-mine coal, as described in detail in last year's report. It continues to perform its work satisfactorily, according to reports. The records show that to date there are three in operation—one on a Mallet locomotive on the Carolina, Clinchfield and Ohio; another on a mikado on the Queen and Crescent, and the third on a class M2 (4-8-0 type) locomotive on the Norfolk and Western. We are informed that there are six additional stokers to be applied to Mallet locomotives on the Carolina, Clinchfield and Ohio, and 15 to the same type locomotive on the Norfolk and Western.

STANDARD STOKER.—Your committee's last report mentioned all stokers concerning the operation of which information had been secured. Since that time some tests of the Standard stoker have been made on the New York Central Lines, in heavy freight service, and the reports so far seem to be quite promising. The company manufacturing the stoker, like other designers, seems to be satisfied that it is working along the right lines, and such may be the case, but time and trial only can determine if it is right. A special feature claimed for the stoker is the elimination of all parts from the engine cab and deck, and the use of run-of-mine coal without previous treatment or selection. The coal is reduced to the required size by an arrangement of the feeding screw, thus eliminating the necessity of a separate crusher. As the coal gravitates to the horizontal screws it is delivered to a point about the centre of the firebox—but at the back end—where another screw, in a vertical position, elevates the fuel to a sufficient height, where it is blown by steam over the fire bed. The machine is actuated by a turbine engine, which is also a departure from the conventional lines followed in other designs. A second stoker of the Standard type has been put on a Mallet locomotive in service on the New York Central, and three more have been secured for experimental purposes on the Norfolk and Western. Two of the latter machines will be applied to heavy freight locomotives of the 4-8-0 type, and the third to a heavy passenger locomotive. The Standard stoker, like the Hanna and Crawford, differs from the Street in that it handles run-of-mine coal, whereas the Street, as now constructed, requires prepared or slack fuel.

AYERS STOKER.—Within the past year some very interesting work has been done by A. R. Ayers, General Mechanical Engineer of the Lake Shore and Michigan Southern, toward the utilization of the chain grate, as we understand it. Your committee is not familiar with the details of the design, nor the progress thus far made, but understands it is not quite ready for application. The idea indeed is interesting, and is a principle your committee believes well worth exploiting. The Standard and Ayers, if we may so designate the latter, seem to represent the most prominent work in the stoker field during the past year.

BREWSTER STOKER.—No reports of further development of this stoker have been received during the year. The statement has been made that its patents have been taken up by the Standard Stoker Co.

STROUSE STOKER.—While nothing definite has been learned concerning any new developments in this stoker during the past year, it has been said that a son of the original inventor is working on the design.

GEE STOKER.—But one stoker of this design has been built to date. It is still in service on a class H-6 (2-8-0) locomotive on the Pennsylvania Lines East, and is reported as giving good results. It is still considered in an experimental stage.

ELVIN STOKER.—With the construction of a full size working model of this stoker, which is now ready for application, a distinctly new principle is offered. While it properly belongs to the "scatter" or "overfeed" group, it may be referred to as the shovel type in contradistinction to the rest. The machine is attached to a casting similar to, and is bolted to, the back head of the boiler—the same manner as the fire door front. It is made up of two shovels, one operating to the right and the other to the left; under full control, distributing coal regularly and evenly over the bed of the fire, as might be expected under expert hand firing. The drum, or stoker mechanism, operates at 20 r.p.m., when shoveling 12,000 lbs. of coal per hour. The operation is entirely mechanical, no steam being used in distributing the coal.

THE RAIT STOKER is a patent of G. B. Rait, of Minneapolis. Your committee has not seen any working drawings, but understands from the inventor that most of the machinery is below the deck of cab. It is also mentioned as an interesting feature that it can be handled as either an underfeed or a scatter type. As yet there is none in operation. We further understand from the inventor that he has some new designs and improvements pending in the Patent Office, and will soon have working drawings ready for exhibition. This stoker is therefore undergoing development.

BARNUM, DICKERSON, ERIE, HAYDEN, Hayden modified, McMullen, Harvey, Hervey and Kincaid.—It cannot be ascertained that there are any of these stokers in service, or that anything has developed concerning them during the past year.

The Norfolk and Western Ry. submits the following performance figures for the Street stoker: All failures chargeable to stokers: Machinery failures in fair service, 43; failures due to flaws and defects in machinery, 4; failures due to machine becoming clogged with foreign matter, 31; shop or bad-workmanship failures, 19, crew failures, or failures due to improper handling, resulting in low steam, 48; failures due to improper lubrication as a lack of attention, 20; total failures, 165; total mileage made by locomotives equipped with stokers, 2,296,803; total stoker failures as above, 165; miles per stoker failure, 13,920; total cost for labor and material chargeable to stokers, $12,-179.22; and cost of stoker repairs per 100 miles, cents, 0.53. Locomotives 1303 and 1311 have not as yet had a stoker failure charged to them, having made 36,089 miles and 35,778 miles, respectively, since the locomotives were put in service new in April, 1912.

The Baltimore and Ohio Rd. reports that the Street stokers in service on that road are making 44,300 miles per failure chargeable to the stoker proper. It may be of interest to mention in connection with the apparent difference in the figures submitted by the Baltimore and Ohio and the Norfolk and Western showing mileage per stoker failure, that the Baltimore and Ohio figures are computed on the basis of the number of machinery failures in fair service and does not include delays caused by the stoker not being properly operated by the engine crews. On the same basis, as can be quickly seen by referring to the tabulation, the mileage per failure on the Norfolk and Western would be equal to 53,414 miles, which is very close.

The following data are submitted by the Pennsylvania Lines West, giving some interesting information in connection with the performance of the Crawford stoker, including all trips of all stokers from the experimental installation to this date:

	As reported Jan. 1913.	As reported Jan. 1914.
Total no. of trips	26,693	98,181
No. of trips—100%	16,445	55,913
" of trips— 99%	262	335
" of trips— 98%	402	723
" of trips—95-98%	1,367	3,865
" of trips—90-95%	1,577	5,352
" of trips—85-90%	560	1,861
" of trips—80-85%	715	2,963
" of trips—75-80%	962	4,086
" of trips—70-75%	305	1,306
" of trips below 70% ...	4,098	21,787

The Norfolk and Western submits the following data for the Hanna stoker: Put in service, Feb. 11, 1914; days in service, 48; trips, 37; 100% or successful trips, 32, or 86%; and failures on road requiring hand firing for a portion or completion of trip to be made pending repairs to be made, 5.

During 1912 there were 165 Street stokers in operation. During 1913 there were 253 additional stokers installed, making a total of 418 in operation. They are distributed as follows:

ROAD.	Consolidation.	Mallet.	Mikado.	Mountain pass.	Decapod.	Centipede.	Pac. pass.	Total.
L. S. & M. S...	..	3	..	..	..	..	..	3
N. & W.	2	90	..	..	..	..	..	92
C. & O.	..	14	50	3	..	..	6	73
B. & O.	1	24	161	..	1	..	..	193
Virginian	..	6	1	..	..	..	..	7
B. R. & P.	..	5	1	..	..	..	..	6
H. V.	..	..	17	..	..	..	..	17
A. T. & S. F. ...	..	1	..	..	..	..	..	1
D. M. & N	..	8	..	..	..	..	..	8
E. P. & S. W. ..	1	..	5	..	..	..	..	6
C. B. & Q.	..	..	1	..	12	..	..	13
Erie	..	..	..	..	..	1	..	1
Total	4	155	236	3	13	1	6	418

During 1912 the Pennsylvania Rd. Lines West of Pittsburg had 153 double underfeed Crawford stokers in operation. The Pennsylvania Lines East of Pittsburg had 2, making a total of 146. During 1913, 155 additional stokers were applied, making a total of 301:

Type of stoker.	Class of locomotives.	Reported Jan. 1913.	Reported Jan. 1914.
12	K2	1	1
12	K2as	26	26
12	K3s	..	30
13	H8c	10	10
13	H8cs	1	1
14	H6a	5	5
15	H6a-b	20	20
16	H6a	1	1
17	H8c	1	1
19	B29	1	1
22	H8c	54	54

22	H8cs	32	32
22	H10s	..	110
23	H6a-b	1	2
25	K2	..	4
25	K2as	2	3
Total—		155	301

SUMMARY.

Type of Stoker.	No. of stokers in service.	No. of stokers on order.
Street	418	82
Crawford	301	..
Hanna	3	21
Standard	2	3
Gee	1	..
Ayers	1	..

Stokers under development—none yet applied: Strouse, Elvin, Rait, Brewster, and McMullen.

Stokers for which there is no advice of further development: Barnum, Dickerson, Erie, Hayden, Hayden modified, Harvey, Hervey, and Kincaid.

During the past year opportunities have been afforded to observe a much larger number of stokers in service, many of them working in pool runs, which rather strengthens the belief that they are capable of going along, faring under the usual average attention given a locomotive, without developing prominent or serious defects that result in materially increasing terminal turning time. The most natural inquiry would refer to the durability of such machines as a whole. It goes without saying that the stoker, with all of its parts, is susceptible to wear, but those in service have no doubt surpassed the general expectation. They require attention and repairs, but the cost figures are not excessive, considering the stage of development through which they are passing. There is no particular work the fireman can do in the way of making repairs on the read, but attention on his part, though slight as a rule, is beneficial and helpful toward preventing failures. The performance of the stokers in service during the past year has served to show what must be met in the way of durability, and what is necessary to withstand the operating strain. Alterations are now in progress looking toward stronger and more durable machines, which should in turn favorably affect the cost of maintenance.

It is noteworthy that when the demands upon the boiler are fairly uniform, permitting a regular feed of coal, the operation of the stoker practically takes care of itself, but, in the absence of automatic manipulation, manual control does not always result in efficient regulation of the fire; on the contrary, the boiler, if anything, is allowed to blow off more than necessary, not only under working conditions, but quite freely when the demands are reduced, and when the locomotive is not using steam, carrying with it some waste of fuel, due, however, to want of attention. Then, again, there is some tendency, through neglect, to allow the fire to get low while standing on the road, making rebuilding necessary; still with the stoker the fire is readily revived, and little, if any, time is lost thereby.

It is still a moot question as to whether it is economical to use run of mine or screened coal. Both schemes are worthy of consideration, depending upon local conditions, and in the same way that it is necessary a road contemplating the use of stokers can only work out the advantages to be gained after taking into consideration the physical character of the road, the size of locomotives, and the tonnage now being handled, it should ascertain whether upon taking into account all local conditions it is more profitable to use the screened or run of mine coal.

As for fuel consumption, it has been pretty clearly shown that the amount of coal used by the stoker (as to some extent obtains in hand firing) largely depends upon the physical character of fuel rather than the heat value, so long as the latter is within a reasonable range. The establishment of data to show the relative fuel consumption by hand firing as compared with the operation of the stoker was sought, but so far there seems to be very little statistical information in such shape as to permit a general ready comparison to be made. At the same time some very complete tests have been conducted under a range of operating conditions, character of fuel, etc., but none of them permit conclusions to be drawn without taking into consideration the character of fuel and conditions under which the highest efficiency was obtained. In order to make a true comparison, therefore, it is necessary to ascertain and fully account for local conditions, character and price of fuel.

The year's experience seems to give color to the belief that the stoker is not necessarily a coal saving device, but that its advantages tend in other directions. Dynamometer tests have shown that the capacity of the locomotive is increased, and according to further reports made by the Pennsylvania Rd. an increase approximating 5% in trainload with the Crawford stoker for an equal amount of fuel hand fired has been obtained. The Baltimore and Ohio reports an increase in train tonnage from 5 to 10%. In both, however, it should be remembered that the differences indicating increased capacity were largely dependent upon local conditions. The Hocking Valley advises, in connection with the Street stoker, that it is using fuel known in the Hocking Valley district as "coarse slack." It is coal that passes through a ¾ in. mesh screen. As for fuel consumption, the Hocking Valley reports that no definite tests have been made, adding, however, that their fuel record showing consumption of coal per locomotive per 1000 miles does not indicate there has been any reduction in fuel per 1000 ton miles, but that the grade of coal used is purchased at about 40% less than run of mine.

In tests made on the Norfolk and Western, it was found with one of the scatter type stokers that there was a considerable increase in coal consumption using Pocahontas slack as compared with Pocahontas run of mine hand fired. The difference in quantity of coal consumed as between screened coal stoker fired and run of mine hand fired was found to diminish as the physical character approached the run of mine, or a product containing a less amount of fine material. While standing along the road it is quite necessary, as can be readily appreciated, to occasionally watch the fire in order to keep it in proper condition and in readiness, especially where slack fuel is used, as the depth of the fire is relatively lighter, but it is not materially unlike what is needed for efficient and economical hand firing.

As referred to in another part of this report, the fuel consumption seems to vary almost in proportion to the physical fineness of the coal used in stoker firing with the scatter type machines, a percentage of the lighter material being evidently drawn through the tubes by the heavy action of the draft. Using Pocahontas nut stoker fired and run of mine hand firing, the consumption figures are not far apart. From this it would appear that with the higher volatile coals containing a smaller amount of fine product, the consumption of fuel as between hand fired and stoker fired should be very close. It also seems evident that though the consumption increases as the coal becomes finer in character, the stoker is better able to maintain steam with it than might be secured on an average hand fired.

With reference to the emission of smoke: It was mentioned in your committee's last year report in substance that, as combustion is improved in stoker firing as against irregular hand firing, there should be some diminution in smoke. Some observers have reported that with a thin fire and conditions otherwise favorable, stoker firing, as with hand firing well executed, little objectionable smoke is emitted, but as the difference in the range of operating conditions and character of fuel are usually so large, a liberal view must be taken of what might be expected. Your committee has not had the opportunity to make extensive investigations, but has received reports that when the feeds are not forced beyond the limits of complete combustion, the reduction in smoke is longer maintained with the underfeed than with the scatter types, on account of the fuel being delivered up through the bed of the fire as combustion progresses, under conditions of service and character of fuel suitable to their present stage of development.

Following the presentation of our last year's report on this subject, some very interesting remarks were made with reference to contemplated experiments with pulverized fuel on locomotives. Several industrial plants have made installations of furnaces for the utilization of powdered fuel, and the report is that satisfactory results are being obtained. It is also understood that the New York Central has made some investigations in connection with the use of such fuel on switching locomotives, and it is still investigating the subject, but up to the present time it is quite experimental. The Pennsylvania has also given it some consideration, but advises it has nothing of interest to offer.

Report of Committee on Tank Cars.

The Master Car Builders' Committee, A. W. Gibbs, Chief Mechanical Engineer, Pennsylvania Lines, chairman, reported in part as follows:

The most important question presented to the committee has been the question of the continued use in transportation service of the old tanks, originally on wooden underframes. At the time the tank car specifications were first drawn, in 1903, the greater part of the tank car equipment came in this class. While some action was urgently required at that time to improve the situation, it was necessary for the committee to be as lenient as safety would permit in the treatment of the then existing cars, and, consequently, the specification for tank cars having wooden underframes was drawn with very mild minimum requirements, among them the provision that the tanks should be tested to but 40 lbs. pressure, which they must stand without leakage. At the same time, however, specifications were made for tank cars built subsequent to that date, requiring steel underframes, and tanks designed for a bursting pressure of 240 lbs., and a test pressure of 60 lbs. per sq. in. Cars built with this specification are now very largely in use, particularly in handling inflammables.

Service having proved destructive to wooden underframe tank cars, owners have been ordering steel underframes, to which to transfer the old tanks. Several of these old tanks have involved the railways in very heavy losses from leakage of contents, due to cracking of the sheets, particularly the heads, probably due to punishment received from the head blocks. Complaints have also been received of a number of very bad tanks developing leakage on the road.

In considering whether old tanks transferred to new steel underframes should not be put on the same basis as tank cars built after 1903, viz., required to stand the 60 lbs. test pressure, some of the owners considered that this would be an unnecessary hardship, and proposals were even made to lower

the test pressure to 20 lbs. Yard tests made of an old condemned tank showed that a tank which would stand 20 lbs. water pressure without leaking would withstand the shock acquired in transportation when filled with a liquid of the same viscosity as water. Notwithstanding this, your committee feels that it is unwise to permit the unrestricted transfer of old tanks to steel underframes, especially where they are to carry inflammables, such as the gasolines. Tanks are running which are known to be more than 35 years old, and as the tank car specification has been in existence 10 years, it would seem that any tank on wooden underframe has already given a reasonable life.

It is felt that there should be a distinction between cars carrying inflammables and those carrying other products not involving the safety question; that the interval between the hydraulic tests should be shorter as the age of the tank increases; and that definite provision should be made in the specification for the retirement from transportation service of tanks which cannot meet the test requirements.

In many cases, the pressure tests have not been made by filling the tanks with cold water as prescribed, in some cases air pressure having been used, or hot water, or even steam. It is felt that such tests do not meet the spirit of the specification, and do not insure the detection of the leaks as the cold water pressure does.

It is felt that frangible lead discs, used in connection with the safety vents, as an alternative to the safety valves on cars carrying non-inflammable products may be safely excepted from the requirements of periodical test, as the test could only develop the bursting pressure of the particular disc tested, which would then be replaced by a new disc, not tested.

Report of Committee on Overhead Inspection of Box Cars.

The Master Car Builders' Committee, A. Kearney, Assistant Superintendent of Motive Power, Norfolk and Western Ry., chairman, reported as follows:—

Following the procedure indicated last June, your committee, when it was called upon by the American Railway Association sub-committee, explained to them in detail the code of rules for the overhead inspection of box cars, formulated at their suggestion. The proposed code was gone over with the American Railway Association committee, studied at length, and several changes were made, without, however, disturbing its general plan or principle. The code, as finally accepted by the American Railway Association committee, was submitted to the executive committee of that Association, and was later laid before the American Railway Association at its semi-annual conference, in Chicago, in Nov., 1913. Your committee has advice that the report and code of rules alluded to, were accepted by the American Railway Association, and were proposed as a recommended practice. It is the understanding of your committee that the railways will, through the American Railway Association, be asked to give the project a thorough trial. Your committee wishes to ask that should the proposition be given a thorough trial by any railways desiring to take hold of the work along the lines indicated in the committee's report, and objections are found (as doubtless there will be), the circumstances shall be fully explained to the committee, so that the card or code may be improved in detail, rather than set them to one side as a whole, should they not perhaps meet certain local conditions. They believe such a course will be more effective and will enable them, if possible, to more quickly determine desirable practices. Your committee, in making this explanation of the status of the work, also wishes to advise it is their understanding that their work is now at an end temporarily, that is, until some report is made pointing out needed alterations in the card or code.

It has occurred to your committee that through some cars not completely reaching the requirements of the code, an opportunity will be offered for a careful check of same, which will readily indicate the additional repairs necessary and at the same time enable railways to compute the cost that will be entailed to reach the physical condition indicated by the card or afford an opportunity to ascertain wherein the requirements are too severe. No railway can do very much alone; on the contrary, the general condition sought by the use of the card can only be effectively reached through each road doing its share.

The card and code of instructions, as finally accepted by the American Railway Association as a recommended practice, are as follows:—

INSPECTION AND CERTIFICATION OF BOX CARS BEFORE LOADING WITH FREIGHT SUBJECT TO DAMAGE.

(Recommended Practice subject to such changes as may be required to meet local or special conditions.)

Note.—This inspection does not cover cars for explosives or other dangerous articles provided for by the Regulations of the Bureau of Explosives.

Freight as described below must be loaded in certified cars which have received a special inspection in accordance with the following instructions. If cars pass the special inspection, this will be indicated by an inspection certificate which will be tacked on each side of the car below the car number.

Classification of Equipment Suitable for the Following Freight.

Classification A.—Package freight liable to loss or damage by water, protruding nails, material carrying odors, oil, grease, or moisture on interior of car, especially the floor.

Classification B.—Bulk freight liable to damage by water, or to loss through small openings.

Classification C.—Freight liable to loss or damage by water or protruding nails, but which cannot be lost through small openings.

The face of inspection certificate should be printed as follows:

INSPECTION CERTIFICATE.
NORTH & SOUTH RAILROAD.
Car Initial..... No.....
O. K. for shipment of commodities

Under [ ] Classification.

Inspected by.....
Date.....19... Station.....

On back of card, inspection instructions should be printed as follows:

INSPECT FOR
and see that car is free from following defects:

Classification "A."	*Classification "B."*	*Classification "C."*
Leaky roof.	Leaky roof.	Leaky roof.
Loose siding.	Loose siding.	Loose siding.
Loose roof boards.	Loose roof boards.	Loose roof boards.
Shifted roof sheets.	Shifted roof sheets.	Shifted roof sheets.
Broken door stops.	Broken door stops.	Broken door stops.
Leaky doors, tops and sides.	Leaky doors, tops and sides.	Leaky doors, tops and sides.
Broken end posts.	Broken end posts.	Broken end posts.
Broken or loose door posts.	Broken or loose door posts.	Broken or loose door posts.
Protruding nails in floor and lining.	Holes in floor and around center plates and draft bolts.	Protruding nails in floor and lining.
Floors or sides soiled by oil, grease or any material carrying odors likely to damage lading.		

When there are inspectors located at points of loading the inspection will be made and certificates attached at that point. Where inspectors are located at a point from which empty cars are distributed to stations the inspection will be made and certificates attached at that point. This inspection will be confirmed by agent at loading point. In all other cases the agent at loading point should inspect the car and file certificates as shown.

Aside from the Master Car Builders' inspection of car, including roof, running boards, air brakes, safety appliances and running gear, as well as the external inspection of sides, ends, doors, ventilators and windows, before inspection certificate is issued, an internal inspection must be made. Search for loose, damaged and broken boards, loose knots, knot holes, bad joints, etc. Search for all nails, spikes, screws and bolts extending above surface of floor and lining and nails protruding through roofing. Search for water stains indicating cracks and air spaces. Examine for metal sheets out of position along edge of sub-carline or down from edge of ridge pole. Doors must open and close properly. Inspect closely for defects in framing which might, by reason of their weakness, allow the sheathing to readily be broken or damaged. Close doors, ventilators and windows and search for light indicating openings and cracks which might produce leaks. Search for cracks sufficient to admit storm water beating through opening; also for openings and bad joints around windows and doors.

When a car is loaded by a shipper the inspection certificates must be detached from the car and delivered to agent before bill of lading is issued. All certificates finally must be filed by the agent at point of loading for future reference.

Report of Committee on Specification and Tests of Materials.

The Master Car Builders' Committee, C. D. Young, Engineer of Tests, Pennsylvania Rd., chairman, and of which E. P. Tilt, Engineer of Tests, C. P. R., Montreal, is a member, reported as follows:

Your committee was instructed to revise certain specifications of the Association and prepare new ones covering certain other classes of material covered in the recommendations of last year's committee on form. Specifications covering 16 different classes of material were sent out for criticism by the members and, as a result of these criticisms and subsequent meetings, it was agreed that the following named materials only could be handled this year: Airbrake hose, heat treated knuckle pivot pins, steel axles, refined wrought iron bars, welded pipe, helical springs, chain, and journal box brasses; and that the specifications covering the following materials could be further investigated and specifications offered at the next annual meeting: Refrigerator car heat insulation materials, mild steel bars for miscellaneous parts, steel castings, rivet steel and rivets, structural steel and steel plates, galvanized sheets, malleable iron castings, and elliptic springs.

Your committee has been in correspondence with the Association of Rubber Goods Manufacturers during this year and is cooperating with it in order to establish standard methods of making tests and standard test apparatus, as there are no standards covering the testing work for this class of material in existence today.

The specifications covering air brake and signal hose for passenger and freight equipment cars have been revised, changing the form of the specifications and explaining the methods of test, but the committee has endeavored not to make any changes in the requirements of the specifications other than

those in existence as standard, and as adopted in 1913. Your committee respectfully recommends that the revision of the specifications for air brake and signal hose for passenger and freight equipment cars be made standard; that the specifications for steel axles be adopted as standard, and that the following specifications be submitted to letter ballot as recommended practice: Refined wrought iron bars, heat treated knuckle pivot pins, welded pipe, helical springs, chain, and journal box brasses.

The report was accompanied by recommended specifications for air brake and signal hose for passenger and freight equipment cars, welded pipe for passenger and freight equipment cars, heat treated knuckle pivot pins for passenger and freight equipment cars, steel axles for passenger and freight equipment cars, refined wrought iron bars for passenger and freight equipment cars, helical springs for passenger and freight equipment cars, chain for passenger and freight equipment cars and journal brasses for passenger and freight equipment cars.

Report of Committee on Couplers and Draft Rigging.

The Master Car Builders' Committee, R. L. Kleine, Chief Car Inspector, Pennsylvania Rd., chairman, submitted a very complete report, of which the following abstract has been made:

Comparisons show that the experimental couplers reported on last year are much stronger throughout than present types of couplers and that your committee is working along the right lines. This work has been conducted jointly with the coupler manufacturers. A joint committee held numerous meetings to discuss and decide upon details and fundamentals of design, such as operation, contour lines, strength of the various parts, dimensions of knuckle hub and knuckle-pin hole, location of knuckle-pin hole and lock set, height of coupler head, size of shank and type of knuckle thrower, etc. Considerable discussion ensued on these points which are very pertinent to design, each one influencing the other to such an extent that full development or perfection of any one will handicap one or more of the others. The members of the association were invited to make a critical examination of the coupler models and give the committee the benefit of their criticisms and recommendations, at last year's convention.

STATIC TESTS.—A series of static pulling tests consisting of two couplers of each design submitted by the coupler manufacturers and exhibited by your committee was instituted at Altoona shops, Pennsylvania Rd. under the direct supervision of C. D. Young, Engineer of Tests. These tests on these couplers were made by laying the couplers off and measuring both deflection and permanent set after each increment of load and tabulating the distortions by so much plus or minus from the original dimensions. A comparison of permanent set at the knuckle openings shows the committee specification type to have a decreased set of 78.9% at 150,000 lbs., and an increased loading of 94.1% at the M. C. B. limit of set. The total load can be increased 75.5%. This likewise applies to the knuckle stretch, which shows a decreased set at 150,000 lbs. of 98.9%, and an increased ultimate load of 69.5%.

ROAD TESTS were continued, and were conducted with couplers of present type on freight cars and with couplers of both present and the experimental design on freight locomotive tenders on the Pennsylvania Rd. The freight car couplers were applied to 100,000 lbs. capacity steel hopper cars in the coal trade between the bituminous mines in western Pennsylvania and tidewater, a service comprising grade and flat country as well as hump-yard classification. The tender couplers were applied to 7,000 gal. steel tenders in general heavy freight service on the Western Pennsylvania division, between Altoona and Pittsburg, which includes heavy grade service. The road tests of couplers on tenders in freight service develop in the shortest space of time the defects as well as the relative life of couplers, and it is surprising to note the short life of couplers of the present type in this service, as well as the relatively longer life that is being obtained from the experimental coupler.

SELECTION OF COUPLERS FOR GENeral trial in service.—Coupler manufacturers designed the working parts of the couplers submitted at the last convention, and it was essential to select from these couplers several designs to be tried in service during the ensuing year to definitely determine the best contour line, efficiency of operation and strength of the various parts, with a view of harmonizing the designs thus chosen and eliminating any details that may prove unsatisfactory to the end of establishing the standard coupler. Accordingly, a joint conference was held with the coupler manufacturers.

The nine couplers submitted to your committee as embodying the joint specifications of design and which your committee exhibited at the 1913 convention, were taken to Altoona and mounted on operating racks for the purpose of studying each and to learn the effects of being in the weather. Each coupler submitted was taken up and each minute detail, both of design and operation, was considered and thoroughly discussed, and by carefully weighing all the points at issue it was decided to try two couplers shown in figs. 1 and 2. These couplers have straight locks and were selected for the general trial, but the committee did not feel like giving up the advantages dormant in the wedge lock principle, which is applicable to most coupler designs, nor did it desire that a wedge lock coupler be tried in service in general, hence it was decided to make and confine further experiments with this wedge principle under the direct supervision of your committee. 5,000 of each type of coupler was the number agreed upon for the tests.

HEIGHT OF COUPLER HEAD ABOVE centre line.—The following were decided on: The hub of the knuckle shall be 8 ins. high. The height of the coupler head above centre line of coupler shank shall not exceed, for a locomotive coupler, 6¾ ins. for a distance of 6 ins. back of coupling line, and for a freight car coupler, 7¼ ins. for a distance of 6 ins. back of coupling line; but using same head as for locomotive coupler, the allowable increase (½ in.) in height for the freight car coupler is to provide for reinforcement of junction of top coupler ear to coupler head. The head shall not be offset below centre line of coupler shank. The design of the coupler shank shall be the same in both experimental couplers. The weight of the complete couplers, 6 by 8 in. shank, 9⅛ in. butt, shall not exceed 400 lbs.

THE COUPLER SHANK, 6 BY 8 INS., design shown by American Steel Foundries was accepted for the present; also that submitted by the National Malleable Castings Co.

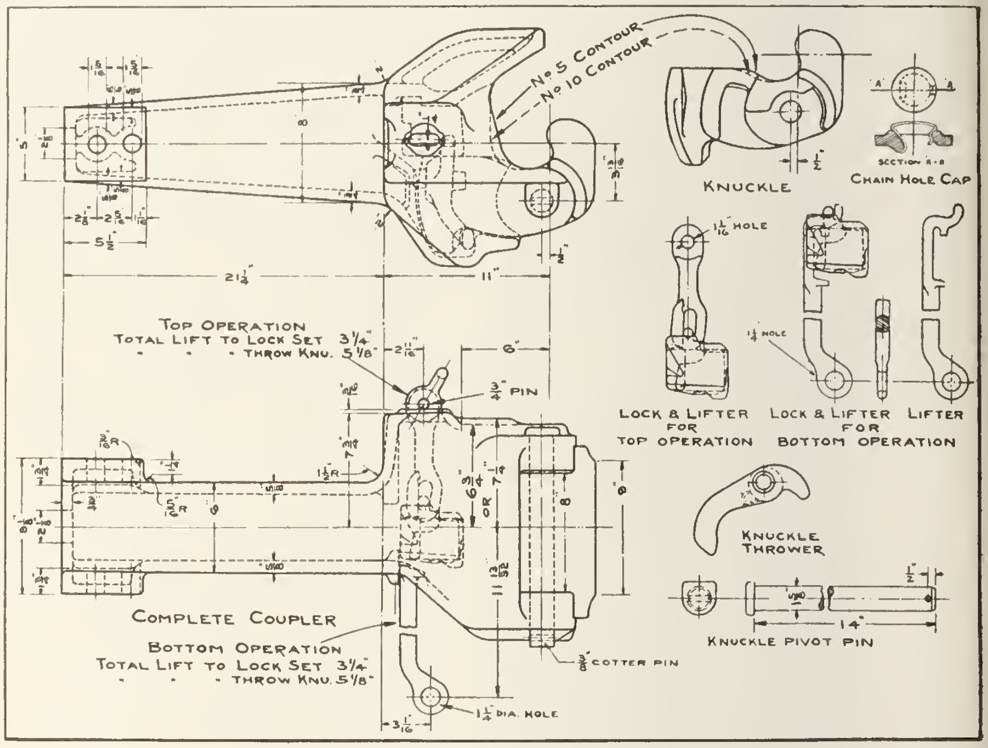


Fig. 1.—Experimental Standard M.C.B. Coupler A.

COUPLER BUTT, to be 9⅛ in., with 1¼ in. vertical face for yoke gib, coupler rivet holes and general design same as present M. C. B. standard.

KEY SLOT.—Uniform standard should be adopted.

COUPLER SHANK, 5 BY 7 INS., to be the same as present M. C. B. standard, with the exception of the juncture of the shank to the head, which is to be in accordance with drawings submitted for the representative couplers.

COUPLER BUTT, same as present M. C. B. standard.

KEY SLOT, same as M. C. B. standard.

MARKINGS CAST ON THE TWO TRIAL couplers.—During the trial of the two selected committee specification couplers it will

be necessary to distinguish one from the other, since from the results of the trial either will be adopted as an M. C. B. standard. They are designated types A and B experimental standard M. C. B. coupler. When the trial or experimental period is completed, the word "experimental" will be dropped, leaving the coupler finally selected or adopted as the standard M. C. B. coupler.

KNUCKLE CONTOURS.—While the patterns were being completed it was brought out that the contour back of the pivot pin of the A and B knuckles in either the no. 5 or no. 10 contour was different, as in fig. 3. The contour of the knuckle of any coupler at this point is determined largely by the distance of the locking surface of the knuckle from the horizontal centre line of the coupler, or rather the thickness and relative location of the locking block. The contour of a knuckle at this point, which is the line connecting its locking surface with the main contour of the coupler head near the ears of the bar, directly affects the operations of coupling and uncoupling and hence is very important. Both manufacturers had good arguments in favor of their particular knuckle contours.

It was demonstrated that the A knuckle of no. 5 contour at the higher angles of centre line divergents or curving gave a condition of binding or hooking in uncoupling which was not present in the B knuckle of no. 5 contour, but the A knuckle on a straight track keeps contact slightly longer between its nose and the tail of the mating coupler in coupling than the B knuckle of no. 5 contour. It was agreed that the A knuckle of no. 5 contour is slightly more desirable for coupling operations and the B knuckle of no. 5 contour is somewhat better for uncoupling operations, but since the effect of these differences in the steel specimens are slight, the manufacturers shall continue to furnish the knuckle-tail contours as at present, with the final shape to be determined by the service trials.

A AND B COUPLERS ON SERVICE-testing machine, to try the knuckle contours for coupling and uncoupling, but particularly ignored. The machine consists of two carriages on an inclined track, each having one coupler mounted level thereon, similar to a freight car, and being electrically driven. The top coupler always remains locked, the lower coupler starts up the incline with knuckle completely open, couples to top coupler, continues upward about 1 ft., during which it is lock-set; the lower car about that time is released by the chain drive, recedes from the top car, which is restricted by a cable, starts down the incline, during which the knuckle is thrown closed and then thrown open before the car is stopped by a buffer. This constitutes one operation or cycle as registered on the stroke counter and the normal speed is five to six operations per minute.

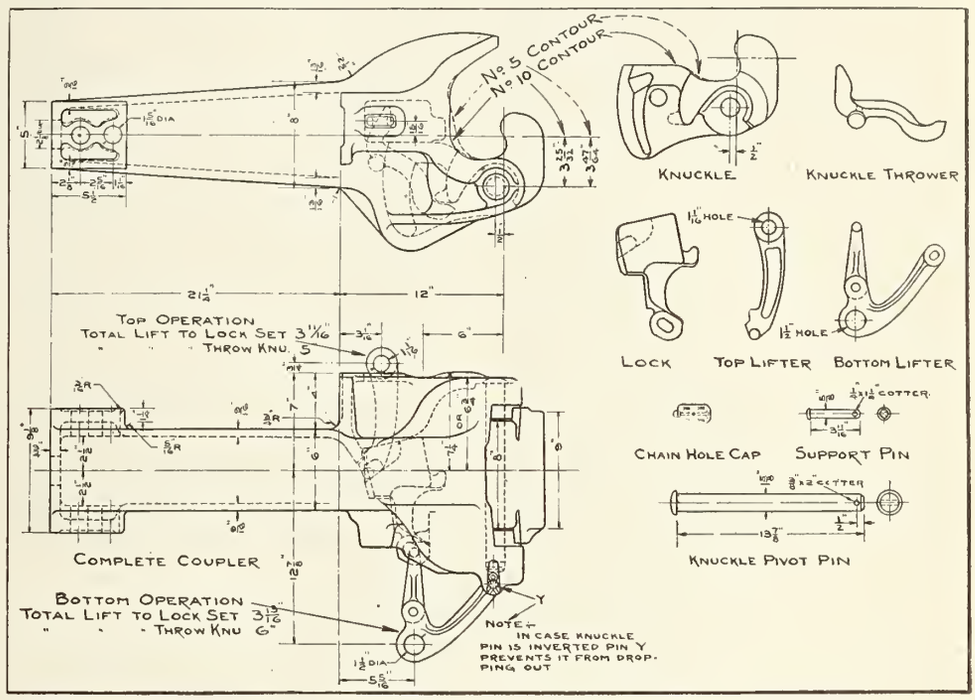


Fig. 2.—Experimental Standard M.C.B. Coupler B.

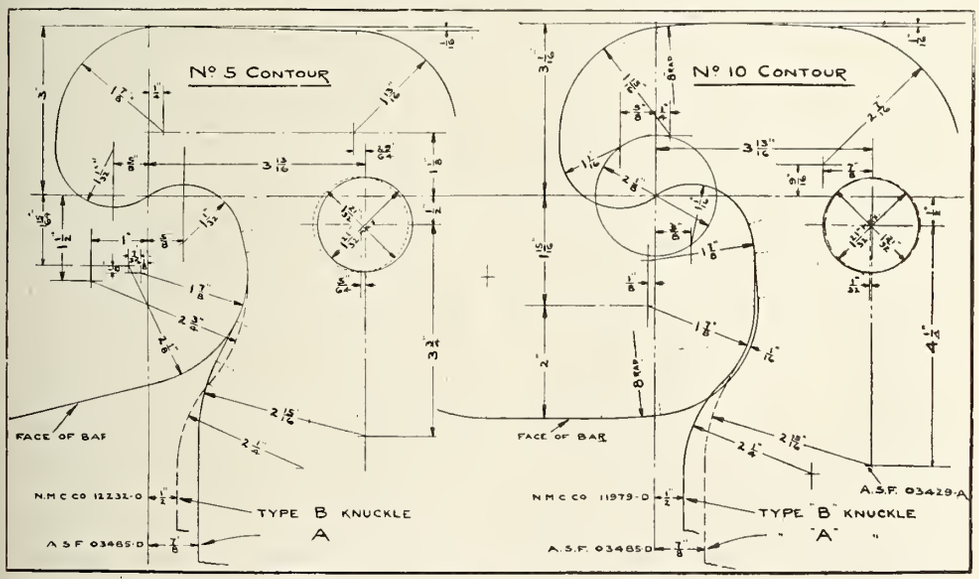


Fig. 3.—Comparison of Knuckle Contours on Couplers A and B.

to test the lasting qualities and efficiency of the operating parts, learn the location, extent and effect of wear of same and ascertain if any changes, however slight, are necessary or desirable in the couplers. While this machine does not administer shocks, it brings out conditions of wear in a week's time that would take several years' service on the road to produce if shocks were

Two A couplers no. 5 contour were tested together and two B couplers no. 5 contour. Each of these tests were run through 30,000 cycles, each of which, as described above, consisted of the following operations for the lower or operating coupler: coupling, lock-setting, uncoupling by withdrawing from other couplers, knuckle pushed to closed position by a lever, then knuckle thrown completely open by uncoupling rod. Assuming a freight car coupler in service will average daily (365 days to a year) the operations here listed as one cycle, these tests each represent 82 years' wear, disregarding effects on operating parts due to strains received in regular service. Each operating coupler tested was, beforehand, laid off, measured, and notes taken on various parts, dimensions and features that were liable to be affected during the tests and very moderately oiled only at this time. Daily logs were taken and the couplers were very carefully and minutely examined after every 10,000 cycles, recording the results and conditions then found by comparing with the various measurements and notes originally made. The machine was out of doors under a shed and severe cold weather obtained.

The results of the tests were very satisfactory and favorable to both couplers. The operating parts naturally were considerably worn, but after each test the couplers were operative in all features with scarcely any impairment of efficiency. New parts were substituted for the worn parts, trying all combinations, and it was found that the couplers were fully operative. Some minor changes were shown to be desirable and these have been made. This was a very severe test and your committee is firm in the belief that not any of the present standard couplers in general use today would meet it.

To date, 2,204 couplers of the A and B type have been ordered by 21 railways, in nearly equal numbers of each type and contour.

BUTT END AND KEY SLOT FOR 6 BY 8 in. shank to accommodate various draft attachments.—The following recommendations or suggestions were received from manufacturers: Not to increase width of butt end over present standard of 5 ins., nor present width, 5 ins. of key. Key slot to be located 5 ins. from rear of coupler butt instead of 4 ins., as at present, and to be made sufficiently large for 7 by 1¼ in. key. Rivet holes for securing ordinary yoke to coupler be increased to three to compensate for increased strength of drawbar. Increase length of coupler, measured from striking

horn to rear of butt, to 25 ins. instead of 21¼ ins. as at present. Allow 2 ins. clearance between slot reinforcements on inside of bar instead of 1¾ in. as at present. Increase thickness of key from 1⅛ in., present standard, to 1¾ in., and increase ribs supporting reinforcement inside bar from ¾ in. to 1 in. Key should be stronger at its elastic limit and ultimate than the knuckle and have slightly greater strength than the weakest part of the coupler head. Heat treat keys and study condition of keys in service to determine best allowable bearing stress and arrive at proper distance through slot. Increase width of butt end from 5 in. to 6 in., beginning taper same as at present.

The following tests of the A and B couplers will be conducted under the direct supervision of your committee: Dynamic and static; angling and coupling; jiggling and lock-creeping; and service machine.

DYNAMIC AND STATIC.—Several will be subjected to the present standard M. C. B. tests—strike, guard arm, jerk, pulling, separate knuckle strike and jerk, and other tests. From these tests a set of specifications and tests will be developed for future purchases of the standard M. C. B. coupler after its adoption.

ANGLING AND COUPLING TESTS, will be made on a machine specially built for determining the greatest possible degree of horizontal angling between two couplers and for testing coupling operations between them when in line or at any angle.

JIGGLING OR LOCK-CREEPING TESTS will be made on a machine specially built to impart vibrations and lock-creeping conditions to couplers under tension, and determine if the locks will creep, and, if so, the reliability and efficiency of the lock-to-the-lock or anti-creep device or feature embodied in the coupler.

SERVICE-TESTING MACHINE, FINAL tests will determine to what extent the changes made were a benefit and will give final results on the durability and efficiency of operating parts and give information as to what may develop in the general trial in service and can be compared with same.

FOUNDRY GAUGES FOR THE STANDard M. C. B. coupler.—Interchangeability of parts of same design of coupler by different manufacturers will be arranged for, should the number of experimental couplers ordered for service trial exceed 5,000. Your committee will, in conjunction with the coupler manufacturers, design and adopt the necessary gauges and practices for this contingency.

HEAT TREATMENT AND ALLOY steels.—It is generally acknowledged that the present coupler is inadequate in strength to meet the ever-increasing demands placed upon it. This suggests the use of heat treatment and also alloy steels. Experiments show good but as yet uncertain results. It is desirable to design the standard M. C. B. coupler on the basis of the present commercial steel.

Report of Committee on Car Trucks.

The Master Car Builders' Committee, J. T. Wallis, General Superintendent of Motive Power, Pennsylvania Rd., chairman, and of which J. Coleman, Superintendent Car Department, G. T. R., and L. C. Ord, Assistant Master Car Builder, C. P. R., are members, reported in part as follows:

LIMITING DIMENSIONS FOR CAST Steel Truck Sides for 80,000, 100,000 and 140,000 lbs. Capacity Cars and Revision of Specifications.—To establish limiting dimensions, the following were governing factors: Relation of centre line of draft gear to the bearing surface of the body centre plate largely established the height of the centre plate of the truck bolster from rail; with this as a base the height from top of rail to top of truck bolster (underside of truck centre plate) was fixed at 26⅞ ins., with empty cars for all capacities. The establishing of the vertical height from the bearing surface of the truck centre plate to the top of spring cap (or underside of bolster resting on spring cap), fixed at 8¾ ins. for all capacities; this is correlated to the maximum height of side frame from rail, established at 31 ins. Vertical height from top of spring cap (or underside of bolster) to top of side frame is made up of the depth of bolster, amount of clearance between top of bolster and underside of top member of side frame and depth of top member, the dimensions of the latter being dependent upon the capacity. Adopting use of the M. C. B. truck springs C for 80,000 lbs., D for 100,000 lbs. capacity and a five cluster spring made up of coils the same as D, giving a uniform spring height for the three capacity trucks and all springs can be built up from the same unit coils, establishing the height from top of spring plank (or bottom of lower spring cap) to top of rail, of 10½ ins. A minimum of 4 ins. is necessary as a safe clearance between bottom of side frame and top of rail with new wheels, bearings, etc., leaving 6½ ins. as maximum total for thickness of spring plank and depth of bottom member of side frame, which latter is determined by design and capacity desired. The widths of bolster openings are governed by the capacity and the width of spring base required, which also controls the wheel base. The cross section of the top and bottom members of the truck side is determined from the capacity and governed by allowable stresses for members made of cast steel and controlled by the specifications and tests.

Each truck side shall be tested in a suitable machine to the following loads for different capacity trucks:

		PROOF TESTS		
Car Capac., Lbs.	Initial Load, Lbs.	Load, Lbs.	Max. deflec., Ins.	Max. set, Ins.
80,000	20,000	110,000	0.15	0.01
100,000	25 000	125,000	0.15	0.01
140,000	35,000	175,000	0.15	0.01

After applying initial load, reduce load to 5,000 lbs. and set deflection instrument at zero; apply the requisite proof load and measure deflection; reduce load to 5,000 lbs. and measure the set. Truck sides shall not vary more than 3% above or 2% below what has been determined as the normal weight of the casting.

Truck sides shall conform to the weights given below:

Car Capac.,	WEIGHTS, Lbs.		
Lbs.	Min.	Norm.	Max.
80,000	*415	*425	*445
100,000	490	500	520
140,000	645	660	685

* Estimated.

CAST STEEL TRUCK BOLSTERS FOR 80,000, 100,000 and 140,000 lbs. Capacity Cars.—Bolsters are designed for removable centre plates, as it simplifies the manufacture and permits the use of a drop forged centre plate. The side bearings are adjustable, as the side bearing clearance diminishes more or less on all types of cars with service and it is difficult and expensive to maintain side bearing clearance on cars of steel construction with metal body and truck bolsters unless adjustment is provided for. Provision has also been made for the use of roller or other anti friction side bearings by establishing a uniform slope of 1 in 28, in that portion of the top plate of bolster where these side bearings will be located. The bolsters shall not vary more than 3% above nor 2% below the normal weight of the casting, and they shall conform to the weights given below:

Car Capac.	WEIGHTS, Lbs.		
Lbs.	Min.	Norm.	Max.
80,000	*660	*675	*700
100,000	735	750	780
140,000	*855	*875	*910

* Estimated.

As the pressed steel bolsters (built up type) are in general use, designs are presented, which are interchangeable with the cast steel bolsters, and which would provide an alternate standard. Gauges have been designed with tolerance for gauging the bolster as well as to provide for interchangeability.

SPREAD OF SIDE BEARINGS, CENTRE to Centre, on Various Capacity Freight Cars from 60,000 to 100,000 lbs.—The committee has not been able to decide on the proper distance for spread of side bearings on 100,000 lb. cars and those of less capacity. In view of the fact that there are comparatively few 140,000 lbs. cars in the country, the committee recommends a spread of 50 ins. centre to centre, on cars of this capacity and believe that it would be wise to make the same recommendation in regard to other capacity cars.

CLEARANCE OF SIDE BEARINGS.—The clearance of side bearings depends on the spacing or spread of the side bearings. The following side bearing clearance for new cars is recommended:

	Min.	Max.
Per side bearing	⅛ in.	5-16 in.
Total (one truck)	¼ in.	⅝ in.

CONSTRUCTION OF CENTRE PLATES For Standard Freight Cars.—The present standard centre plate with 100 square in. bearing area has been generally adopted with slight modifications on 80,000 and 100,000 lb. cars, and the performance under cars of 80,000, 100,000 and 140,000 lbs. has been satisfactory. A change in the over all height of the centre plates as well as the rivet spacing is necessary to make these centre plates applicable to cars of steel construction and to the bolsters recommended. It is essential that the centre plates be made of either steel castings or drop forgings; the latter are preferable as they can be more accurately manufactured and have smoother bearing surfaces, the cost being slightly in favor of the drop forging.

SPRINGS FOR TRUCKS.—The cast steel truck side limiting dimensions and the bolsters for the 80,000, 100,000 and 140,000 lb. freight cars have been designed to accommodate the springs shown on sheet M. C. B. H of recommended practice, as follows:

C for 80,000 lb. cars; D for 100,000 lb. cars; and five double coil cluster, made up of coils the same as D, for 140,000 lb. cars. This enables the same design outside and inside coils to be used for all three capacity trucks by varying the combination of number of coils and using the different design of spring caps according to capacity.

STRENGTH OF ARCH BAR TRUCKS as Compared with Cast Steel Truck Sides.—Cast steel truck sides, conforming to the modified M. C. B. specifications, are superior to the arch bar truck sides.

Gauges for 6 in. by 11 in. journal boxes have been designed.

Report of Committee on Damage to Freight Car Equipment by Unloading Machines.

The Master Car Builders' Committee, P. F. Smith, Jr., Superintendent of Motive Power, Pennsylvania Rd., Chairman, reported as follows: Much interest has been taken in the recommendations made last year, by railways owning machines, by in-

dustrial plants and by all manufacturers of car dumping machinery. Much has been accomplished in reducing the damage to freight cars by those applying the blocking to their movable platen type machines in accordance with typical design submitted to the 1913 convention, and adopted as recommended practice.

A member of your committee called on the manufacturers of the machines of the solid floor type and suggested that they give some consideration to modifying their hydraulic clamping arrangement to eliminate the damage to cars. It was found that after receipt of the 1913 report they had done some preliminary work along the line suggested and would be prepared to submit drawings and estimates of changes in existing machines of the solid floor type, and further that no more machines of that type would be built and that future machines would be of the movable platen type. It was also found that the steel manufacturers and industrial plants are taking a keen interest in the matter and had a committee of thoroughly competent members going over the individual machines, and were having blocking applied as per our recommended practice to movable platen type machines and corrections made to those of the solid floor type.

There are a number of new car dumping machines being installed this year with cradles of increased length to accommodate the larger cars, and after this year's experience with them is analyzed, some modification in our recommended practice may be necessary for these machines. For existing machines we have no modifications of our report of 1913 to recommend, but would impress on all the need of properly spotting cars in cradle, the importance of maintaining blocking by renewing face, the absolute necessity of maintaining extension clamps at all times and to properly supervise machines at industrial plants to insure their carrying out the recommendations of this association.

Report of Committee on Fuel Economy.

The American Railway Master Mechanics' Committee, W. Schlafge, General Mechanical Superintendent, Erie Rd., chairman, reported in part as follows:—

Seventeen questions were sent out to the mechanical department heads of the railways; a digest of the answers is given herewith.

Clean boilers contribute largely to fuel economy; scale formation leads to broken staybolts, leaky tubes, seams and mud rings, with the consequent loss of boiler efficiency and increased fuel consumption for a given amount of evaporation. Experiments show that every 1-16 in. of scale requires 15% more fuel. In some localities, the water used for locomotive boiler feed contains a certain amount of decayed vegetable matter, and the scale is somewhat soft and porous. The loss of fuel is very much less, with this sort of scale, than with hard scale. Good boiler feed-water, together with thorough cleaning of boilers by washing out, keeps the amount of scale formed down to a minimum.

Keeping the valve gear in good condition, in order to obtain correct steam distribution, and by proper lubrication, to prevent hot bearings, the friction or internal losses in the locomotive will be reduced to a minimum.

Tests of superheater locomotives in both passenger and freight service have shown a saving in fuel, as much as 25%; somewhat less than this must be expected in regular service. Superheaters make it possible to get a higher sustained tractive power out of a locomotive. The savings resulting from their use, therefore, would not show upon a locomotive mileage basis, but would appear when figured on a ton mile basis, which is, to a certain extent, proportional to the work done.

Experience has not yet justified the application to locomotives generally of preheaters and feed water heaters.

Outside valve gear holds its adjustment and gives a better steam distribution, resulting in more or less indeterminate economies.

About 10% fuel economy can be obtained from the brick arch. It also affords considerable protection to the flues by keeping them at a nearly constant temperature and thus prevents certain losses due to leaks, and the arch tubes give increased heating surface of the most valuable kind.

It is doubtful whether savings can be claimed for the mechanical stoker. Its chief merit is its capacity for firing larger quantities of coal than can be handled by a fireman.

Special appliances, such as automatic fire doors, power reverse gears, rectangular and variable exhaust nozzles, and smoke consuming devices all have a tendency to produce economy. An efficient set of draft appliances assists in producing a saving of fuel. A special recording device attached to the safety valve will show how long it has been open during any stated period. A 3 in. valve carrying 200 lbs. will waste about 20 lbs. of coal per min. To promote the greatest measures of fuel economy, several roads have organized fuel departments and placed in charge a fuel engineer, or a superintendent of locomotive operation, reporting to the Mechanical Department head. This department has jurisdiction over matters relating to the proper operation of locomotives, economies in fuel, lubricants, other supplies and kindred subjects. On some roads a travelling engineer and a travelling fireman are assigned to each main line division, and in some cases covering side lines as well.

For the instruction and encouragement in locomotive operation, on the Erie Rd., a supervisor of locomotive operation or road foreman of locomotives to every 50 locomotive crews or less is required, each having supervision over one specific class of service. Their duties cover instruction of enginemen in the proper methods of firing, efficient handling of the locomotive, and operation of fuel saving devices, and hold periodic class meetings at the different terminals, where the road instruction is carried further by lectures. When an engineman has a record up to a certain fixed standard, the number plate of his locomotive is painted red. After he has belonged to the order a sufficient length of time to warrant it, his name is placed on the cab of his locomotive in letters of gold.

Class or individual instruction is essential, but the latter is preferred, and should be followed up invariably by practical demonstration. Locomotive class instruction at terminals is growing in favor.

For the instruction of enginemen, firemen, hostlers and locomotive preparers, when first entering the service, on the properties of fuel and the system to be practised to secure the best results, firemen are usually employed by the road foreman or supervisors of locomotive operation, and before going into regular service they are given some preliminary instructions and practice. They are required to make a stated number of trips as a student fireman with an engineman competent to instruct them in the proper methods of firing. Instruction books treating on combustion and fuel economy are furnished to all enginemen. These books and a set of standard instructions, operating rules, book on good firing, firing charts and other information are given to new firemen. A supervisor or road foreman or fireman instructor generally rides with the new fireman for one or two trips in order to get him properly started and to teach him the fundamentals of the art of firing. Most roads have progressive series of examinations pertaining to firing and operation, which each fireman must pass before he can be promoted to engineman.

The method by which enginemen and firemen co-operate to avoid loss and waste of fuel and unnecessary firing, is usually to hold the engineman responsible and to see that he instructs his fireman. Engineman and fireman should work in harmony. They should examine their records on the performance sheet and be inspired to make a good showing.

In a consideration of whether it is good practice to generally inform enginemen and firemen by circulars or charts of the temperatures that can be obtained in the firebox of a locomotive by the varying degrees of heat and the color of the flame, the majority of the replies indicate that, as an educational measure, it is of value to impart such information to locomotive crews.

Some roads compile data and make up an individual performance sheet, monthly, showing comparison of enginemen in different classes of service on each operating division, based upon the consumption of fuel, lubricating materials and other supplies. Some consider this a good means of checking the results as between individuals, while others take the opposite view, claiming that there is a great lack of accuracy in the data secured and that when figures are not reliable the data are without value.

There seems to be a universal sentiment opposed to a plan of giving money premiums or prizes of any sort as an incentive to enginemen to improve and maintain a good fuel record.

In the preparation of coal for use in making a good fuel record, wherever conditions permit, the bituminous coal should be broken into small convenient sizes, in order to secure the best results from hand or stoker firing, because the smaller lumps burn more readily and tend to produce a greater evaporation per pound of coal. The best sized coal seems to be that which will pass through a 1¼ in. and over a ¾ in. screen. For anthracite burning locomotives, egg size, or that which will pass through a 2¾ in. and over a 2 in. screen, seems to be generally considered best. For a mixture of anthracite and bituminous coal, a general rule is difficult to state, because so many variables enter into the proposition.

For making the best fuel record, the majority believe that coal run over a ¾ in. screen will make a better record than run of mine coal on a basis of lbs. of coal burned, but if the price is considered, run of mine coal containing not above 30% slack will make the best record.

The most valuable essential of fuel economy is good supervision.

Of devices or appliances for use on locomotives or tenders to prevent waste en route and at coaling stations, the following materially assist: Iron or wooden coal gates of good design; fenders on tender platforms and inside of gangways to keep coal from falling off; movable covers over shaker bar openings, or collars around same; and prevention of overloading of tenders.

Some roads have experimented with various types of mechanical coal pushers, but the results are not, as yet, conclusive.

The only advantage to be gained by storage of coal is that it provides a supply of fuel during periods of strikes or shortage, but it is detrimental to fuel economy for the following reasons: Double handling increases cost; spontaneous combustion is liable to occur; bituminous coal slacks; and when stored on the ground, dirt is apt to be picked up with it.

As a rule, an analysis of the constituent parts of coal is not furnished to enginemen and firemen, because data of this sort are not considered of much value to enginemen.

It has been found generally very important to instruct enginemen and firemen in the principles of combustion. They should be made to understand how the gases of combustion influence the color of the fire and that unburned gases cause black smoke. This subject should be thoroughly covered in the instruction books on fuel economy, as well as in the individual and class instruction.

CONCLUSIONS.—Care should be exercised always to have fuel furnished according to a rigid specification and this should be further followed by close inspection at the mines. Proper grades of fuel should be maintained for each class of service as far as possible in order to keep the efficiency of both the enginemen and the locomotives as high as possible.

Too much care can not be exercised in keeping accurate coal records, especially at coaling stations. At the same time losses in fuel by overloading tenders and careless handling of locomotives at terminals should be stopped as far as possible. Fuel savings must be made by all concerned and not by the enginemen alone, if the coal bills are to be reduced as much as they can be.

The boiler feed water should be improved wherever possible, and if necessary good treating plants should be installed. The savings resulting from reduction of scale and decreased boiler maintenance will pay the cost of treating boiler feed water where necessary. Suitably located blow off cocks of good design are also a great aid in keeping down boiler scale.

Emphasis should be laid upon the necessity of close co-operation between enginemen and firemen, and between these men and their supervising officers; strict adherence to the proper methods of operating locomotives, proper care and adjustment of lubricators to avoid damage to valves, valve seats and piston packing; and the maintenance of standard adjustments of front end arrangements, exhaust nozzles and other parts essential in producing free steaming locomotives. Definite assignment of the most suitable classes of locomotives to each division, and as far as possible, assignment of regular crews to locomotives, are great aids in fuel economy.

The recent successful application of powdered fuel to industrial plants points the way to large savings in locomotive fuel consumption, provided the system can be successfully adapted to this kind of service. Although there will be an increase in cost per ton due to pulverizing the coal, the expected savings should more than offset this. Some of the advantages claimed for powdered fuel are: Greater capacity of locomotive, and lightening the work of the firemen; reduced fuel consumption due to more perfect combustion, and elimination of standby losses; reduction of smoke; and ease of handling.

Notwithstanding the mechanical aids to effect economy of fuel, it is a settled fact that a well organized department, invested with full charge of the fuel problem, and nothing else, will accomplish material results. Experience of many roads proves conclusively that the institution of such a department is followed by savings which abundantly justify the expense of the administrative and supervising organization.

Report of Committee on Steam Locomotives. Method of Conducting Laboratory and Road Tests.

The American Railway Master Mechanics' committee, C. D. Young, Engineer of Tests, Pennsylvania Rd., chairman, and of which W. H. Flynn, Superintendent of Motive Power, Michigan Central Rd., formerly Master Mechanic of its Canada Southern division, is a member, reported in part as follows:

Locomotive tests are of two kinds, laboratory and road. The former are made at a locomotive testing laboratory where the driving wheels can be mounted on the supporting wheels of a friction brake apparatus for suitably disposing of the power. The road tests are made under conditions of service on the road, the locomotive hauling a train of cars.

Laboratory Tests.

The object of a laboratory test is to determine the steam and coal consumption per unit of power when the locomotive is operated under fixed conditions.

PREPARATIONS.—All driving wheels should be turned to same diameter and should be standard contour. Each pair of driving wheels should be checked to see that they are correctly quartered for the crank pins. If the locomotive selected has ever been through the shops for general repairs, the frames should be tried to see that they line with the cylinders. The boiler tubes must be new or newly pieced, so as to be free from boiler sediment. The steam cylinders should be approximately the same diameter and as near to that called for as standard for the class of locomotive, as practicable, and they should be bored if not in good condition. The piston packing rings should be in good condition. On D valve locomotives, the valves and seats should be faced; and on piston valve type, old bushings should be bored if not in good condition, or new bushings applied Piston valve packing rings should be examined and in good condition, after which a test pressure of at least 60 lbs. should be applied to the steam pipes to determine that the throttle, steam pipes and exhaust passage are tight. The front end arrangement for the locomotive should be carefully gone over and checked with the print in accordance with which the front end is supposed to have been applied. The stack and draft pipe should be lined to determine that it is properly erected with reference to the exhaust nozzle. Steam joints in the injector and delivery pipes should be tested to determine that they are steam tight. The lift of the throttle valve should be determined for each live notch on the throttle lever quadrant; when necessary, the cut-off should be taken for each notch on the reverse-lever rack. The locomotive selected should reach the laboratory at least 4 days prior to the time when it is scheduled to go under test, in order to permit the application of all instruments and to take the necessary measurements of various parts of the locomotive.

FUEL.—A standard coal should be selected that can be easily obtained on short notice, and in accordance with the special object in view. If maximum efficiency or capacity is desired, the coal should preferably be some kind that is regarded as a standard for the locality where the locomotive is operated. When oil fuel is used, the rule governing the tests may be modified to conform to the characteristics of liquid fuel.

THE APPARATUS AND INSTRUments required for laboratory tests of a locomotive are as follows:—Platform scale for weighing coal and ash. Tanks and scales for weighing water. Graduated scale attached to water glass. Pressure gauges graduated to at least pounds for boiler, branch pipe, receiver, exhaust and at other points as is required. Draft gauges for smoke box, fire box and ash pan. Thermometers for calorimeter, branch pipe, receiver and exhaust. Pyrometers for fire box, smoke box and at other points as is required. Steam calorimeter. Steam cylinder indicators. Speed recorder to denote revolutions of driving wheels. Gas analysis apparatus. Friction brake apparatus. Dynamometer for determining the pull at drawbar. Some form of indicator rigging. Planimeters, micrometers, scales, calculating instruments, etc. A calibation should be made by water glass method of both safety valves, and a correction made during a test. The scales, gauges, thermometers and pyrometers should be carefully calibrated at specified intervals.

APPPLICATION OF INSTRUMENTS. — The pressure gauges for boiler, branch pipe and exhaust should be connected with a long siphon and located at convenient points for the observers. Care should be taken to make correction for pressure should the gauge be located so that the water head would affect the reading. For taking temperature of steam in the branch pipe and exhaust passage, thermometers should be inserted into wells, and given proper depth of immersion.

The indicator reducing motion should be some form of pendulum type with light tube for transmitting the reduced motion to a point near the indicator. The pipes leading from the cylinder to the indicator should be not less than ½ in. inside diameter, and they should connect into the side of the cylinder rather than into the heads, thus making a very short connection. Short bends in the pipes should be avoided and they should be well lagged to prevent radiation. A light framework should be secured to the cylinder to act as a brace for the indicators, and for the motion-rod supports. Absolute rigidity is highly essential in this particular. Care should also be taken to set the indicators in such a position, that the finger on the end of the motion rod travels in a direction pointing to the groove in the drum proper.

Draft gauges consisting of U tubes properly graduated in inches, containing water, should be placed at convenient locations, and connected at the smoke box or any other point at which the draft is taken, with a ¼ in. pipe A rubber tube connection should be provided to connect the draft pipe with the U tube. In the smoke box the pipes should be located at the horizontal centre line of boiler in front and back of diaphragm.

The draft in the fire box should be taken through a drilled stay bolt, located at a point about half the length of the fire box and about 24 ins. above the grates. The draft in the ash pan should be taken at some convenient point at about the centre of the entire grate area.

The smoke box pyrometer or thermometer should be inserted so that the hot point or bulb is below the tip of the exhaust nozzle and in front of the table plate. If a thermometer is used for this purpose, it should be graduated to 1,000 degrees. The

tube placed in the fire box for inserting the pyrometer should be located opposite the stay bolt drilled for the draft. This tube should be a piece of 2 in. boiler tube and located on the centre line of a stay bolt.

The gas sampling pipe should be located at the smallest area under the draft plate, and in the centre of this area. This pipe should have numerous drilled holes equally spaced and the total area of the holes should not be more than the inside area of the sampling pipe.

A steam calorimeter should be attached either at the dome at a point close to the throttle valve, or to the branch pipe according as it is desired to obtain the character of the steam at one point or the other. The former location is preferred. A perforated ½ in. pipe should be used for sampling and conveying the steam to the calorimeter.

OPERATING CONDITIONS.—In a laboratory test where maximum efficiency is the object in view, there should be uniformity in such matters as steam pressure, quantity of coal supplied at each firing, thickness of fire and in other firing operations. The rate of supplying the feed water should be uniform through the entire test, and a certain level (about second gauge cock), should be maintained from start to finish of test.

THE DURATION of a laboratory test of a locomotive will depend on the character of the fuel used, rate of combustion and working limitations of the revolving parts. The test should preferably be continued until at least 25 lbs. equivalent evaporation of water per sq. ft. of heating surface has been obtained. If from the graphical log the coal and water performance are uniform, tests of 3 hours will be the limit.

STARTING AND STOPPING.—The fire having been thoroughly cleaned and banked when necessary to permit coking, previous to starting the test, the bank should be broken up and fresh fuel supplied. The locomotive should be started and run at the speed of the test a sufficient length of time to build up a level fire, and which should be, as near as possible, so maintained throughout the test. When all conditions of fire and speed have become uniform, the thickness of the fire should be noted, but the starting signal for the beginning of the test proper should not be given until the locomotive has been run at least 10 minutes. Observe the steam pressure and time and record the latter as the starting time of test. Water level should be maintained uniformly throughout the test. The ash pan should be cleaned at the starting signal. When the end of the test approaches, the fire having been kept at a uniform thickness during the run, the time and water level should be noted and test stopped. When the test is completed the ash pan should be cleaned and cinders, if any, should be removed from the smoke box.

RECORDS.—A log of the data should be entered on printed forms and records taken at 10 min. intervals, unless a special test is in progress, where the readings may be taken more frequently. The coal should be weighed out in not less than 300 lb. lots and the time taken for each lot burned. Weighing tanks of sufficient capacity should be provided to maintain water in the supply, varying in head not more than 6 ins., and readings of the water consumed should be plotted upon the graphical logs at convenient regular intervals. Indicator diagrams should be taken at the same periods the other data are taken.

A sufficient number of observers should be supplied in order that all important observations should be taken simultaneously. At a laboratory where 2 tests are made each day, the number of men required is as follows:—Foreman; assistant foreman; stenographer; chemist; 7 computers; brake wheel operator; dynamometer observer; smoke observer; cab and coal observer; temperature and pressures; speed, boiler pressure, drafts and pyrometers; water observer; 2 indicator observers; gas sampler; 2 oilers; engine operator; 2 firemen; 3 draftsmen; and 3 coal passers and janitors; totaling 32 men. The force would have to be increased should a Mallet locomotive be tested. All observers, operators, oilers and firemen should assist in dismantling and fitting up laboratory when locomotives are changed.

THE ASH AND REFUSE withdrawn from the ash pan and smoke box at the end of the test should be weighed in a dry state, and if desired, sample taken for analysis of heating value and unburned carbon.

SAMPLING COAL.—If the coal to be tried is more than the amount necessary to make the test, it should be sampled according to the recommendations of the committee of the American Chemical Society governing carload sampling, which are as follows:—6 shovelfuls should be taken along each side and 6 across the centre of the car. If the car is to be unloaded into bins, a small amount of coal should be taken off the conveyor buckets or wagons while the entire car is being unloaded. In all events the sample should not be less than 300 lbs., and after it is crushed and quartered about one quart should be taken and placed in an air tight jar for chemical analysis. On all tests the total moisture should be used in the calculations.

CALORIFIC TESTS OF COAL.—The analyses commonly made are what are termed "proximate" analyses; these consist in the determination of the following items:—Fixed carbon, volatile matter, moisture hydroscopic, moisture total, ash and sulphur, and the B. t. u. per pound of fuel.

For complete determinations of the quality of coal, it is necessary to make ultimate analysis, which requires the determination of the following additional items:—Carbon, hydrogen, nitrogen and oxygen by difference.

THE DATA AND RESULTS of the laboratory test should be compiled in a tabular form as detailed in the report, 792 items in all being considered. These items are divided into the following general groups, with the number of items in each group accompanying:—Driving wheels, 25; engine truck wheels, 7; trailing wheels, 6; wheel base, 9; weight of locomotive, 17; cylinders, 12; piston stroke, 9; clearance in per cent. of piston displacement, 13; receiver volume, 7; steam ports, 29; piston rods, 9; tail rods, 9; valves, 9; valve travel, 9; valve steam lap, 13; valve exhaust lap, 13; miscellaneous, 7; boiler, 7; tubes, 12; superheater, 11; fire box, 10; fire doors, 7; grates, 9; air inlets, 11; heating surface, 11; boiler volumes, 7; exhaust nozzle, 11; reverse lever, 7; ratio, 11; constants, 14; piston displacement, 13; observed data, 6; speed, 9; position of levers, 6; temperatures, 14; pressures, 14; draft, 9; injectors, 4; quality of steam, 10; coal, sparks and ashes, 14; smoke, 6; analysis of coal, 9; calorific value, 8; analysis of smoke box gases, 10; water, 11; dynamometer, 8; cutoff, 15; release, 15; compression, 15; pressure from indicator cards, 15; steam chest pressures, 11; pressures at cutoff, 15; pressure at release, 15; pressure at compression, 15; least back pressure, 15; boiler, 7; evaporation, 12; equivalent evaporation, 29; summary of engine results, 15; receiver, 8; expansions, 10; i.h.p., 15; division of power, 12; per i.h.p. hour, 9; summary of locomotive results, 9; per 1,000,000 ft. lbs. at drawbar, 18; machine friction of locomotive, 8; efficiency, 7; ratios, 8; summarized statement of average results, 41.

Road Tests.

THE OBJECT of a road test is to determine the steam and coal consumption of a locomotive per unit of power under practical conditions of the locomotive in railway service.

ALL OF THE PREPARATIONS given in laboratory tests should be carried out preparatory to placing the locomotive in service, with the possible exception of not having all driving wheels newly turned, and equipping the locomotive with the various instruments that can be done while the locomotive is in the shops for repairs.

FUEL.—The same consideration should be given to the fuel as on a laboratory test. To facilitate the measurement of coal and the determination of the quantity used during any desired period of the run, it is desirable to provide a sufficient number of sacks, of a size holding 100 lbs., and to weigh the coal into these sacks preparatory to starting on the test.

THE APPARATUS AND INSTRUments required for a road test of a locomotive are as follows: Platform scale for weighing coal. Crane, spring balance and bucket for weighing ash. Tank and scales for calibrating the tank. Graduated scale attached to water glass on boiler. Float for measuring height of water in tank, or, if preferred, graduated scales on all four corners of the tank. Pressure gauges graduated to pounds for boiler, branch pipe, receiver and exhaust. Draft gauges for smoke box, fire box and ash pan. Thermometers for calorimeter, branch pipe, receiver and exhaust. Pyrometers for fire box, smoke box, and at other points as required. Air pump counters. Water meters. Steam calorimeter. Steam cylinder indicators. Speed recorder for the revolutions for the driving wheels in case no dynamometer is accessible; on Mallet locomotives two recorders should be used. Some form of pendulum indicator rigging. Traction dynamometer for determining pull at drawbar, with its complete equipment. Electrical connection between locomotive and dynamometer. Planimeters, micrometers, scales and calculating machines, etc. Steam used for auxiliary purpose other than the cylinders, such as air pump, calorimeter, injector overflow, train lighting and heating, and what escapes from the safety valves, may be estimated from data obtained by testing them either before or after the trial. The scales, gauges and pyrometers should be calibrated before and after the tests are made.

APPLICATION OF INSTRUMENTS. All of the instruments given under laboratory test should be carried on road tests as far as practicable, with a few exceptions. The indicator rig should be some form of pendulum motion with a light tube for transmitting the reduced motion to a point near the indicator. The apparatus which is most suitable consists of a three-way cock for the attachment of the indicator, with a steam chest connection, so that diagrams can be drawn on each cylinder card and pressure determined. The three-way cock should be provided with a clamp rigidly secured to the cylinder and thus overcome any tendency of the indicator to move longitudinally with reference to the driving rig. The support for the motion rod should be secured to some point on the steam chest. Care should be taken to set the indicators in such a position that the finger on the end of the motion rod travels in a direction pointing to a groove in the drum proper. The pipes leading from the cock to the cylinder should be not less than ½ in. inside diameter, and if possible not exceeding 36 ins. long. They should be connected into the side of the cylinder, rather than into

the heads. Sharp bends in the pipe should be avoided and they should be well lagged to reduce radiation.

If a dynamometer car is not used, a stroke counter should be placed at some convenient point in the pilot box to record the revolutions of the drivers. This can be conveniently driven from a finger on the motion rod of the indicator rigging.

To facilitate the working of the men who operate the indicators and read the instruments at the front of the locomotive, and to protect them from wind or rain and jolting, a suitable pilot box extending back to the cylinder and properly secured to the bumper beam should be provided.

Whenever practicable, the bulb of the thermometers used in branch pipe, receiver or exhaust should come in direct contact with the steam and no wells used. When thermometers are placed in wells, they do not respond quickly with the different changes in the working of the locomotive.

The water meters should be attached to the suction pipes of the injectors, and located at points where they can be conveniently read while the locomotive is in motion. Each meter should be provided with a check valve to prevent hot water from flowing through them from the injectors, and strainers to intercept foreign material. With the water scoops it will be impossible to use a float, but when tests are made on roads not using water scoops, a suitable float should be made for determining the water consumption. The water level may be established by using a rubber hose with glass tube inserted in the end, which will indicate the height of water in the tank, this tube to be brought in contact with a properly calibrated scale, or, if more convenient, long glass tubes may be provided at each corner of the tank for the same purpose. In all cases the term "branch pipe" refers to the steam supply pipe to the cylinders and not the injector branch pipe.

OPERATING CONDITIONS AND DURATION. The same operating conditions should be maintained as far as practicable as on a laboratory test. The duration of a test is the running time minus the time the throttle is closed, and depends upon the length of the run between locomotive terminals. In fast passenger service the runs should be, if practicable, at least 100 miles. In service requiring frequent stops and in freight service, the distance may be much shorter. The length of time upon which the hourly rate of consumption and evaporation are based is the total time that the throttle valve is open and not elapsed time between the starting and stopping time.

STARTING AND STOPPING. The fire having been thoroughly cleaned, banked to permit coking, fresh fuel should be supplied to a level thickness which will be required for the run. After the locomotive is attached to the train, observe the pressure, the water level or meter readings, and when the locomotive starts take this as the starting time. Thereafter cover the fire with weighed coal and proceed with the regular work of the test. The ashes and refuse should be removed from the ash pan and smoke box before the locomotive is coupled to the train.

During the run the fire should be maintained in as equal and uniform condition as practicable, and when the end of the route is reached the fire should be as level and approximately the same thickness and condition as at the start. When the locomotive is stopped and the proper level of the fire obtained, the weighed coal should be discontinued. If during the run a stop of over 7 mins. is made, and in order to keep the fire in proper condition, fresh fuel must be supplied; this should be selected from the unweighed coal. There should preferably be no water supplied to the boiler, and if it is supplied, allowance should be made for same.

On reaching the terminal, the fire being in the same condition as at the start, the water level and water supply should be noted. The time the locomotive comes to rest should be the time of stop of test.

RECORDS. The tests should be in charge of a competent person who is thoroughly familiar with road operations. The number of observers required for a test depends upon the nature of the data to be obtained. When making an efficiency test at least 6 observers should be located on the locomotive, 2 for taking indicator diagrams and any other data that can be taken from the pilot box, 2 for cab data and 2 for coal and water records. It is frequently necessary to increase this force when taking special data. In the dynamometer car at least 4 observers are required, 1 to record the time of each start and stop, passing each station and recording mile posts, points of curvature and tangent and any other important information; 1 to record all information on the diagram and keep track of indicator cards, and 1 to take car numbers and weights of trains; this latter man can also act as a relief observer. When making test of Mallet type of locomotive, the locomotive force is increased to take indicator cards from the low pressure cylinders.

The time to take records depends entirely upon what facilities are available for recording same. If a dynamometer car is available for the tests, records should only be taken when some change in the operation of the locomotive takes place, such as throttle lever, reverse lever and boiler pressure. If the dynamometer car is not available, all records should be taken preferably every 5 mins.

Special reading of the meters and total number of sacks of coal fired should be taken at specified stopping and passing points. Careful observations should be made throughout the run, of the time passing all important points, arriving and leaving each station, and the time that the throttle valve is opened or closed, not only at each stop, but when drifting.

ASH AND REFUSE AND SAMPLING COAL. In weighing and sampling the ash and refuse, the same preparation as described for laboratory tests should be followed as far as practicable The coal should be sampled while it is being weighed off in 100 lb. lots, and a small proportion taken at different times until about 300 lbs. is obtained. This should be crushed and quartered and about one quart placed in an airtight jar and sent to chemist for analysis. When this method of sampling is used, care should be taken that the coal does not take on additional moisture, due to leaky cistern or sprinkler. If there is any question as to the coal taking additional moisture after it is once weighed out, sample should be taken from each sack as it is emptied. On all tests the total moisture should be used in all calculations. The same practice as used on laboratory tests for calorific tests of coal should be used on road tests.

DATA AND RESULTS. The data and results should be reported in accordance with the form given for laboratory tests as far as practicable, and in addition a summarized form should be made giving some additional 29 points dealing specifically with the road run as distinct from a laboratory test.

DISCHARGE FROM LOCOMOTIVE SAFETY VALVES. To determine the amount of steam discharged from the safety valves of a locomotive undergoing a road test necessitates the following preparation, as determined by road tests on the Norfolk and Western Rd:—The outer side of one of the safety valves is drilled and tapped near the top of the muffler for the insertion of a plug (flush with the inside wall of the valve muffler), threaded at each end with a ⅜ in. pipe thread. The plug forms a conical convergent nozzle having a minimum orifice of 3-32 in. A ¼ in. w.i. pipe is run from the plug connection down to the rear of the locomotive cab roof, where a flexible connection, such as a rubber steam hose, is made of sufficient length to reach the bulkhead of the tender. From here a ¼ in. pipe is run down along the side of the tender to a point where it is directed into the water compartment and connected to a 1 in. coiled pipe, or condenser, extending down to the bottom of the tank and connecting with a small reservoir located on the outside of the tender frame. Steam, which is admitted to this line when the safety valves lift, is condensed in the coil and collected in the reservoir. A drain cock located at the bottom of the reservoir is used to draw off the condensed steam at the end of each test for the purpose of making the desired calibration. The accuracy of the determination required previously demands a very careful calibration of the safety valve and the orifice, so as to ascertain the exact ratio of steam discharge through the orifice to the total amount of steam discharged through the safety valves. This ratio determined, and the amount of condensed steam passing through the orifice ascertained at the end of the test, the discharge at the safety valves may be calculated for the test period.

Report of Committee on Locomotive Headlights.

The American Railway Master Mechanics' Committee, D. F. Crawford, General Superintendent of Motive Power, Pennsylvania Lines, chairman, presented a very exhaustive report of 330 pages, covering its investigations. A long series of tests were conducted, and in order to thoroughly cover the work the majority of the types of head lights on the market were procured, and additional headlights were assembled, in order to completely cover the range of light intensity from the minimum oil headlight to the maximum electric arc headlight. The investigation was then carried on to determine the desirable and objectionable features of headlights of different intensities, irrespective of the character and source of light, arrangement and design of reflector, etc. In covering this vast amount of work there was an average of twenty men devoting their whole time to the investigation for five months. All these numerous tests and the methods under which they were conducted, are covered in detail in the report, the observations being depicted graphically on charts. An appendix covers all the recent headlight legislation by the several State legislatures in the United States.

In rating the headlights it was decided to assume as the reference plane the horizontal plane 3 ft. above the rail, ahead of the locomotive, and to consider the intensity of rays striking this plane at various points. All laboratory readings were taken normal to the ray in a vertical plane, 25 ft. ahead of the focal centre, and perpendicular to the axis of the beam. Readings were taken at angles to correspond to stations in reference planes 50, 100, 200, 300,

400, 500, 600, 700, 800, 900 and 1,000 ft. ahead of the focal centre. Three points were taken for each station, one corresponding to the centre of the track, and one corresponding to 20 ft. each side of the centre, the three points being in the same straight line at right angles to the beam.

RECOMMENDATIONS AND CONCLUSIONS.—In order that a headlight shall be of such intensity as not to cause a misreading of signals, obscuring of hand signals, fuses, red lanterns and classification lamps by opposing headlights, and be of such intensity as not to temporarily blind the engineman looking into the same, it must have an apparent beam candle power not greater than 3,000, referred to the centre of the reference plane, from 500 to 1,000 ft. ahead of the locomotive.

In order that the engineman shall have sufficient illumination ahead of the locomotive to allow him to readily perform his duties while operating in and out of passenger terminals and industrial sidings, while switching in yard, and to readily locate whistle posts, yard limit and crossing signs and such other landmarks en route, a headlight, due to depreciation or to variation in the intensity of the source, must not at any time during service have apparent beam candle power less than the following:—

Central readings.		Readings 20 ft. each side of centre.	
Distance	Apparent c.p.	Distance	Apparent c.p.
500	450	50	30
600	490	100	110
700	500	200	225
800	500	300	315
900	500	400	350
1000	500		

The above readings are to be considered independent of the location of the headlight, the source and intensity of the light, the design of reflector, etc. To design a headlight to meet the above requirements, the height of the headlight above the rail must be decided on; then, with a given kind of light, the design of reflector, the relative arrangement of reflector and source of light, the intensity must be such that the readings will fall below the designated maximum with sufficient margin above the minimum requirements that they will not at any time, during the depreciation in the source of light, reflector, etc., fall below the minimum requirements.

The Use of Electric Motors in Railway Shops.

By B. F. Kuhn, Master Mechanic Lake Shore and Michigan Southern Railway.

No hard and fast rule can be laid down as to just what system should be used in any particular shop until the local conditions have been thoroughly studied and analyzed. There are two great divisions: the alternating current and the direct current systems. Each has certain advantages and its champions, but before adopting either system the actual cycle of operation of each individual machine must be carefully considered before a selection is made.

Considering direct current for railway shop service, the voltage automatically established as 500 v.d.c is unsuitable for use on account of its tendency to hang on after an arc has once been formed, and the severity of a flash, shock or burn that an attendant might receive; 110 v. is too low on account of the amount of copper required and also the brush, commutation and contact requirements of the motors, controllers, etc. 220 v. seems to be the ideal for d.c. motor drive, and with a mixed load of motors and lighting, 3 wire d.c. generators can in many cases be used to advantage. The 3 wire d.c. distribution also has its advantages for motor drive in that a wide range in speed can be secured and the motor will be operating very efficiently at all times.

The type of motor to use in any particular case must necessarily depend on the operation to be performed, thus on cranes and hoisting work the motors should in most cases be series wound, but there are some cases in hoisting and conveying work where it is necessary to use either a compound winding or an interpole motor, as it is possible under certain conditions for a straight series wound motor to run away with a light load, and this would not be possible where the motor is provided with a shunt winding to prevent the speed of the motor reaching the danger point. This type of motor is also suitable for use on transfer tables and turntables. There are other operations which require a heavy starting torque from the motor and, when in operation, require that the motor drop off in speed as the load comes on, such a cycle of operation, for instance, as occurs on a punch or shear, or any other tool provided with a fly wheel, and for this class of service a compound wound motor should be used. Other drives require comparatively small starting torques but require constant speed after being put in operation, such as driving line shaft or any similar operation; a shunt wound motor should be used.

In applying motors to machine tools, one must again carefully consider the cycle of operation before selecting the winding for a motor, and many of the motors used on machines tools are combinations of the three different types of motors described above. On some machine tools a small amount of variation is sufficient and increases in speed from 10 to 15% may be secured on the straight shunt motors, but where the range in speed would amount to 2 to 1, 3 to 1, or 4 to 1, motors for such operation should be of the shunt wound interpole type. These motors commutate very successfully over the whole range in speed. Wherever a cycle of operation is peaky, as in the case of a planer, motors of the interpole type should be used. Just to point out what can be done in this matter of speed variation, I would state that there are in use today motors of 100 h.p. capacity that have a range in speed from 100 to 1,200 r. p. m., this variation in speed being secured without keeping in service any series resistance.

The d.c. motors of the compound wound, shunt, and interpole types are generally provided with starting devices equipped with overload and no voltage release coils, this being a simple and effective means of protecting the motors and tools from injury due to an overload or to the failure of power and its sudden restoration to the line before an attendant might have an opportunity to cut the motor out of circuit. D.c. machines have their commutators and brushes which require care and attention, but commutator trouble has been reduced considerably owing to the fact that motor manufacturers have adopted one method or another to increase the commutating capacity of their motors. It will be seen from the foregoing that the d.c. system has certain advantages, particularly in its flexibility, for it is possible to secure a d.c. motor that will efficiently meet almost every conceivable cycle of operation.

The a.c. motors are divided into three general divisions: the short circuit induction motor, the slip ring induction motor and the synchronous motor. The short circuit type requires from 3½ to 4½ times full load current from the line while developing full load torque at starting; the slip ring type will draw 1½ times full load current from the line while developing full load torque at starting, and the synchronous motor will draw approximately 3 times full load current from the line while developing 3-10 full load torque. The short circuit type does not lend itself to variations in speed as does the shunt wound d.c. motor and it is, therefore, suitable for constant speed operation only. The resistance of the motor, however, may be varied so as to give almost the same characteristics as the compound wound d.c. motor. This type of motor is especially adapted to punches, presses, etc., of moderate sizes, but there are cases where extremely large presses are used where it is desirable to use the slip ring type induction motor rather than the short circuit type. The slip ring type induction motor is used for hoisting, conveying, cranes, etc. The beauty of the short circuit type is that it has no moving contacts, the only rubbing parts being two bearings. The short circuit type are normally also provided with no voltage release coils in their starting devices and are also provided with overload release coils or fuses. The series wound d.c. and the slip ring type motors are also provided with fuses or circuit breakers, as the case may be, depending upon the class of work they are being called upon to do. Other features that have been developed for different controls are the remote control which allows the operator to start or stop a motor which may be located some distance away. Then we have the master type controller, in which the operator simply operates the master control and the controller itself is operated by electromagnets, thus relieving the operator of all the manual work. There has also been developed the push button type controller, which simply requires that the operator to start a machine press a button and the machine will automatically come up to speed, the current being limited at all times by the controller so that there is no unnecessary jar or strain as the tool starts from rest and comes up to its normal speed.

In the woodworking department, in many cases, the motors can be direct connected to the machines, and in most cases high speed motors can be used. If d.c. motors are used for this class of service, they should be shunt wound and entirely enclosed, and the starting box enclosed in metallic case lined with asbestos. If the short circuit type induction motor is used for this class of service they need not be dustproof, but the bearings should be dustproof and arrangements should be made to have the sawdust and shavings blown out of the motors at regular intervals and the motors should be provided in large sizes with oil immersed compensators, and in small sizes where they are thrown directly across the line the starting switches should be enclosed in asbestos lined metallic cases. As a general thing motors in the woodworking department should be provided with shaft extensions on both ends, for there are many cases where it is important that each machine be provided with its own blower for carrying away the sawdust. Where machines are equipped in this way with their own individual blowers, a great saving is effected, as the blower is in use only during the time that the machine is in service, whereas if one common blower is used for the whole woodworking department the load is practically the same, whether a few machines are in operation or all the machines in operation. Individual blowers are saving some woodworking departments a steady load of between 40 and 50 h.p.

Motors have been made for almost every conceivable method of mounting: floor, wall, ceiling, vertical and even for back gear drive; they have also been used for belt, chain and rope transmission and also gear drive, and in still other cases the motor shaft has been direct coupled to the driven shaft. Motors have been made of the open semi-closed and dustproof types; they have been provided with bronze, babbitt and ball bearings, and have been furnished of 2 and 3 bearing types. For gear driving, 20 h.p. is about the limit for two bearing motors, and there are some cases where even motors of 15 h.p. should be provided with a third bearing in order to properly support the shaft, for as a general rule standard motor shafts are not heavy enough to stand the shocks met with in gear drives.

In actual practice it has been determined by experiment that the friction loss from engine to tool, where the shop is equipped with line shaft drive, ranges from 30 to 60%, and in some cases the losses have exceeded 60%. The losses in transmitting power electrically from engine to tool in the case of a shop equipped with individual motors for each tool seldom exceeds 30%. But of course this is not the only advantage in the case of the individual motor for each tool. Take the case of a machine shop containing a large number of tools at a time, when one wishes to operate only a few tools, the line shaft and friction losses are practically the same as they are when all tools are in use. While in a shop with each tool provided with its own motor these friction losses are entirely eliminated. Then again, in the case of the shop depending upon line shaft drive, if anything goes wrong with the main belt or line shaft, all the tools are put out of service, while in case of tools equipped for motor drive this does not occur.

Even going back to the prime movers in the case of belt transmission and line shaft drive, there is only one avenue of transmitting the power from the engine to the line shaft, where with electric drive there are, as a rule, duplicate units, and if for any reason one set is put out of service, the auxiliary set is always ready to be put into commission.

There is also the advantage in having the generating station composed of several units so that if anything goes wrong with one unit only a portion of the shop may be shut down. Then, too, this is not always necessary, for generating stations will, as a rule, easily carry 25% overload for a couple of hours and thus give sufficient time in some cases to make necessary repairs. It is almost always necessary to run the steam plant at all times for supplying current for lighting and power at some points in close proximity to the shop, and should the occasion arise where some special job has to be taken care of during the time when the shops are not in actual operation, the current is always available for the motor at any desired point. Engine houses and coaling plants which require power and light can be thus supplied without having a power house installed at these points.

A few years ago, the load factor of railway machine shops was about 19%, and due to the introduction of high speed tool steel and the motor for individual drive the load factor has been raised in some shops to approximately 37%. With the shop equipped with tools for motor drive, the whole shop layout can be rearranged from time to time to suit the various conditions which may arise in the method of handling the different work and also the installing of additional new tools, and it is also possible to take advantage of floor space which in the case of a shop with line shafting it would be impossible to utilize.

A very distinct advantage that the shop equipped with motor operated tools has over the shop operated with line shafts is that the belts and overhead work are done away with, such shops are lighted much more efficiently and a great deal of danger is eliminated. In this day of safety first, the elimination of line shaft and belt drive is something that we all should strive for, and in the revamping and extending of our shops, the question of abandoning line shafts and belts should receive very serious consideration.

Report of Committee on Revision of Standards and Recommended Practice.

The Master Car Builders' committee, T. H. Goodnow, Superintendent of Car Department, Chicago and North Western Ry., chairman, submitted a report, which is abstracted as follows: It is recommended

That: permission to use skeleton wedges on 5 by 9 in. and 5½ by 10 in. journals be withdrawn.

That the brake chain, instead of being preferably 7-16 in. with a ⅜ in. minimum, be made 7-16 in. alone.

That the rear of the coupler yoke be changed to be formed with a ⅞ in. radius at the inside corners, and fitted with a 1 in. filler block, wrought iron or steel, having 1 in. radius ends, the same to be riveted to the back end of the pocket with a 1¾ in. countersunk rivet.

That the signal lamp socket be approximately 9½ ft. from the top of rail to the bottom of slot, and so located that the axis of the socket is 45 degrees with the centre line of the car. The variation in the clearances of railways, size of markers and lens, etc., makes it impracticable to recommend a fixed location transversely.

That the accompanying sheet, M.C.B. 26A, covers the new marking of freight cars, and that the information as to marking is permissible with the use of metal badge plates, the letters on which to be not less than 1-16 in. in relief and ⅛ in. bar or staff.

That the journal box lid key for the 6 by 11 in. journal box, be the same as for the 5½ by 10 in.

That the journal box, bearing, wedge, lid, journal bearing, wedge gauges and dust guard for the 6 by 11 in. journal be advanced from the status of recommended practice to standard.

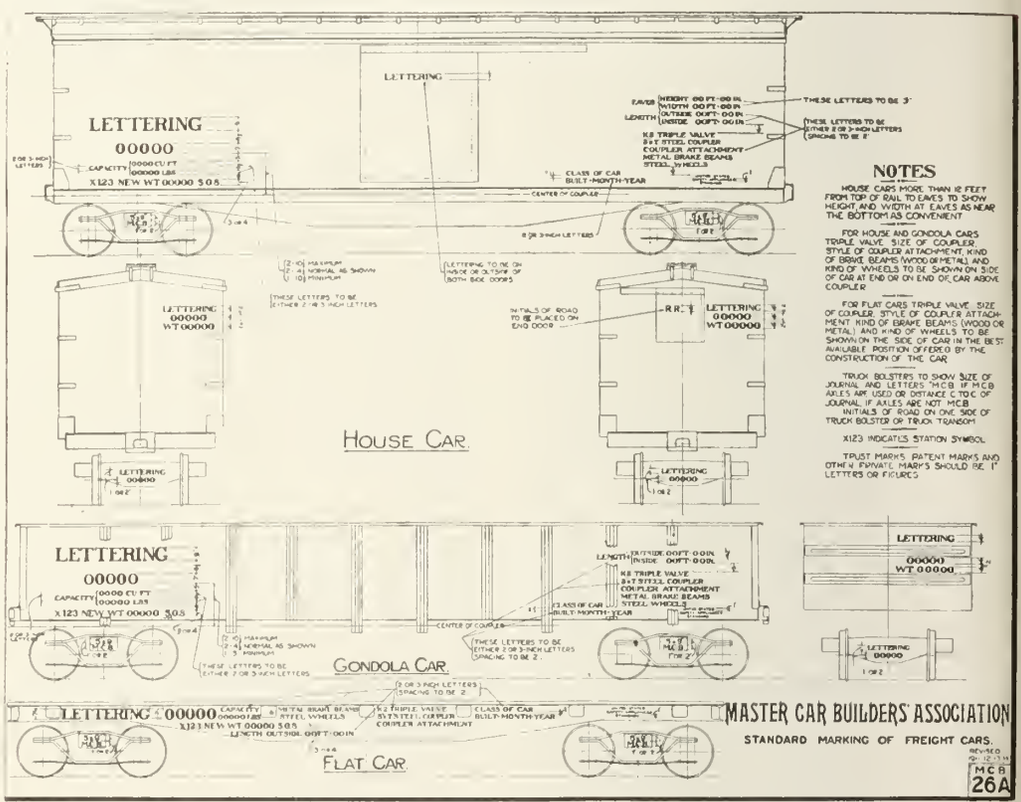
That the end for the hopper door operating shaft be advanced in status to standard.

That for cars built after Jan. 1, 1915, witb 10 in. air brake cylinders for freight cars weighing between 37,000 and 58,000 lbs. light weight, and triples K-1 for 8 in. and K-2 for 10 in. equipment, be advanced to the status of standard.

That the position of the bolting lugs of the air brake hose at the coupling and at the nipple end, as well as the position of the air brake hose label, be advanced to the status of standard.

That the diameters for 33, 36 and 38 in. steel and steel tired wheels be advanced to the status of standard.

The committee considered 43 suggested changes in recommended practice and standards. Of these, the following disposition was made: Not approved, 9; Secretary instructed to make changes or additions, 12; referred to committee on car wheels, 6; referred to committee on car trucks, 1; referred to committee on loading rules, 1; referred to committee on car construction, 1; referred to committee on specifications for test of materials, 1; referred to committee on train brake and signal equipment, 1; and referred to letter ballot for change in standard or recommended practice, 11. All these latter 11 are briefly abstracted in tbe foregoing.



Recommended Standard Marking of Freight Cars.

Report of Committee on Revision of Rules of Interchange.

The Master Car Builders' committee presented through J. W. Taylor, Secretary, a report, reviewing the numerous suggested changes in the rules on interchange, and passing judgment thereon. The more important recommended changes are abstracted as follows:

Rule 1. To make more explicit what is meant by this rule, covering the maintenance of cars on foreign roads in repair, the word "running" is omitted.

Rule 2. This rule as it affects leaking tank cars to be changed to read, "Cars containing inflammable liquid which is leaking, must be repaired or transferred without unnecessary movement, or at nearest available point." Also, that bad order cards be attached to car after lading is transferred, before returning to delivering line, showing thereon the defects and date car was refused.

Rule 3. New rule as follows: "(a) Cars will not be accepted in interchange unless equipped with air brakes having 1¼ in. air brake pipe and angle cocks; also quick action triple valve, pressure retaining valve and an efficient hand brake. (b) Cars will not be accepted in interchange equipped with stem or spindle coupler attachments. (c) Cars built after Oct. 1, 1914, with journals or journal bearings other than M. C. B. standard, will not be accepted in interchange. (d) Cars built after Oct. 1, 1914, will not be accepted in interchange unless equipped with either the no. 1 or the no. 2 M. C. B. standard brake beams and so marked plainly on strut by stamping or casting on. (e) After Jan. 1, 1915, tank cars (empty or loaded) will not be accepted in interchange unless the safety valves are stenciled to show adjusted, etc., within the time limit required by pars. 5, 6 and 7 of the M. C. B. specifications for tank cars. (f) After July 1, 1916, cars will not be accepted in interchange unless stenciled showing month and year originally built. Cars built prior to 1895 may be stenciled 'Built prior to 1895.' (g) After Oct. 1, 1915, no car built for the purpose of carrying products which require the use of salt with ice for the refrigeration of such products will be accepted in interchange unless equipped with suitable device for retaining the brine between icing stations. (h) After Oct. 1, 1916, cars will not be accepted in interchange unless equipped with all metal brake beams. (i) After Oct. 1, 1916, cars will not be accepted in interchange equipped with continuous draft rods. (j) After Oct. 1, 1916, no car will be received in interchange unless the body of the car is marked as provided in rule 86, i. e., either capacity, maximum weight, and on tank cars limit weight no. 1 or limit weight no. 2. (k) If the car has air signal or train line steam pipes, the hose, pipes and couplings are at owner's risk, unless the car is stenciled that it is so equipped. (l) When two or more cars chained together, or any car which requires switch chains to handle them, are delivered at an interchange point, the receiving road shall deliver to the delivering road at the time an equivalent number of switch chains of the same size as the chains so used on the cars delivered, or, in lieu thereof, furnish a defect card for such chains. It is felt that it would be much better to concentrate these special requirements regarding the interchange of cars under one head or rule than to have them scattered all through the book."

Rule 4. Changed to read, "Defect cards shall not be required for missing material in fair usage from cars offered in interchange. Neither shall they be required of the delivering company for improper repairs that were not made by it, with the exception of the cases provided for in rules 35, 56, 57 and 70."

Rule 9. Stem yoke not required to be specified on billing repair cards, as they are not acceptable after Oct. 1, 1914.

Rule 12. Referring to the use of the joint evidence card, add new paragraph as follows: "The joint evidence may be obtained at any point on the home line at which the improper repairs are found, but preferably at the point where the car is received, and only after an actual inspection has been made."

Rule 17. Revised as follows: "(a) In repairing foreign cars: Defective non M. C. B. standards may be replaced with M. C. B. standards (which must comply with M. C. B. specifications), provided such substitution does not impair the strength of car. Any increased cost resulting from and any expense of alteration necessary for the application of such M. C. B. standards shall be charged to the party responsible for the repairs. Any expense of alteration necessary for the application of such M. C. B. standards to be charged to party responsible for the repairs. Scrap credits to be allowed for undamaged parts thus removed. (b) Malleable iron, wrought iron or steel M. C. B. standards may be substituted for each other or for gray iron M. C. B. standards. Gray iron M. C. B. standards applied in lieu of malleable iron, wrought iron or steel M. C. B. standards shall be considered as wrong repairs. (c) In replacing M. C. B. standard couplers or M. C. B. temporary standard couplers, the dimensions of shank and butt of M. C. B. couplers standard to the car must be maintained. (d) If the car owner elects on account of improper repairs to remove M. C. B. standard or M. C. B. temporary standard coupler in good condition, secondhand credit should be allowed, and charge be confined to secondhand coupler applied. (e) When necessary to renew brake beam, any metal brake beam meeting M. C. B. specifications may be used, provided that the beam applied is at least as strong as the beam standard to the car. (f) Billing repair card to specify kind of material applied and removed. and bill rendered in accordance therewith. (g) Cast iron brake shoes may be replaced with brake shoes having reinforced back and the increased cost charged to party responsible for the repairs. (h) White pine, yellow pine, fir or cypress may be used when repairing siding, when of equal grade or quality to the material standard to the car. Fir, oak or southern pine may be subsituted for each other in renewing or splicing of longitudinal sills. These changes will discourage the use of non M. C. B. standard material and facilitate freight car repairs."

Rule 18. The date after which cars having couplers with stem or spindle attachments or American continuous draft rods will not be accepted in interchange, is extended from Oct. 1, 1914, to Oct. 1, 1916.

Rule 19. Definitely forbidding the use of malleable iron couplers, open knuckles and malleable or steel backed journal bearings in repairs to foreign cars, and including cast iron brake wheels.

Rule 20. Making compulsory the changing of couplers to standard height.

Rule 21. Making the spreading of car sides, an owner's defect, so that applied transverse tie rods are chargeable to the latter.

Rule 28. Eliminated.

Rule 29. Reworded to read: "When second hand axles are applied, the journals must not exceed ⅜ in. over the standard length, and the collar must be not less than 5-16 in. thick. The diameter of the wheel seats or centres, must not be less than, or the diameters of the journals must be at least ⅛ in. greater than, the limiting diameters given in rule 86." Balance of rule as at present.

Rule 33. New rule: "The following will not be considered as an owner's responsibility: Straightening or replacing ladders, handholds, sill steps or brake shafts."

Rules 37 and 38. Referring to combination of damages: to be eliminated.

Rule 42. Substitution for the two first foot notes of the following: "When a combination of defects involves decayed parts, or involves longitudinal sills requiring renewal or splicing, due to elongated holes, or to sills split on this account, a joint inspection statement, made as per rule 120, shall accompany the billing repair card, which together will be authority for bill against owner."

Rule 52. To read: "Running boards in bad order or insecurely fastened," owner's defects. "In making repairs to safety appliance details, nails or lag screws must not be used where screws, bolts or rivets are required by law. Handholds or grabirons must be of wrought iron or steel."

Rule 56. Extension of time with regard to rule that after Oct. 1, 1915, cars equipped with brake beams other than metal, will not be accepted in interchange.

Rule 57. Latter part changed to read: "After Oct. 1, 1914, the delivering line will be responsible for hose not conforming with the 1913 M.C.B. standard specifications, and so labelled, except that 1905 M.C.B. specification hose, the date of which shows it was manufactured before Oct. 1, 1914, may continue in service until it is worn out."

Rule 60. With regard to marking of air cylinders and valves, add "Old markings must be erased before new stencilling is applied."

Rule 62. To read: "In replacing air brake hose on foreign cars, new M.C.B. standard 1913 specification hose must be used."

Rule 69. To read: "Broken flange; chipped flange, if chip exceeds 1½ in. in length and ½ in. in width. Broken rim, if tread measured from flange at a point ⅝ in. above tread is 3¾ ins. in width, provided these defects are caused by derailment or wreck." Owners responsible.

Rule 78. To read: "Cracked or broken flange, chipped flange if it exceeds 1½ in. in length and ½ in. in width; broken or chipped rim, if tread measured from the flange at a point ⅝ in. above tread is less than 3¾ ins. in width; cracked tread, cracked plate, one or more cracked brackets, or broken in pieces, provided these defects were not caused by derailment or wreck." Owners responsible.

Rules 79, 80 and 82. Be made vacant.

Rule 87. To read: "Any company making improper repairs is solely responsible to the owner, with the exception of the cases provided for in rules 3, 56, 57 and 70, and excepting that a company applying axles smaller than the limits given under rule 86 shall not be held responsible for improper repairs if the car is not stencilled showing the capacity or maximum weight, or limit weight I. or limit weight II."

Rule 88. Making obligatory the marking of the improper repairs on the car.

Rule 95. Changing part of rule covering rendering of bills, as follows: "Brake beams, including shoes, heads, jaws, key bolts, cotters, brake pins and hangers, when lost with the brake beam. Brake levers, lever guides, key bolts, pins, cotters, top and bottom brake rods, whether or not they

are lost with the brake beam. Labor and material may be charged for key bolts, cotters and brake pins when lost independently of above items."

Rule 105. Adding to rule: "Manufactured articles are those that are not subject to competitive prices, and which can only be obtained from one manufacturer or concern."

Rule 112. To read: "When the body or trucks of a foreign car are destroyed or badly damaged, the owner shall, upon request, furnish depreciated value of body and trucks separately (the same to be figured from the date the car was originally built), and the party damaging shall have the option of rebuilding or settling under the depreciated value. If it is decided not to rebuild, the owner must be immediately advised."

Rule 115. Change end of last paragraph: "Except the second hand value will be allowed for all metal brake beams good for further service and the average credit price for wheels." Abolish reference to damaged steel and steel underframe cars.

Rule 120. To read: "A car unsafe to load on account of general worn-out condition due to age, decay or corrosion, shall be jointly inspected by the handling line and a representative of the owner of or a disinterested line, whichever can be most conveniently obtained by handling line. If inspectors agree that the car is unsafe to load on account of general worn-out condition due to age, decay or corrosion, the result of such joint inspection, entered on a form, shall be sent to the car owner, showing in detail all defects found on car, also an estimate of the cost to rebuild the car. Upon receipt of this information the owner must either authorize the destruction of the car, or authorize the handling company to rebuild it. In the latter case the owner must forward to the handling company complete plans and specifications necessary for the rebuilding of the car. If the owner elects to have the car destroyed, the handling line shall allow credit for all material at M.C.B. scrap prices, less labor cost of destruction."

Rule 121. Be made vacant.

PASSENGER CAR RULES.

Rule 3. To read: "Equipment and tools missing from the inside of baggage, mail and express cars are at owner's responsibility."

Rule 17. To read: "All inside or concealed parts of passenger equipment cars are at owner's risk."

Report of Committee on Brake Shoe and Brake Beam Equipment.

The Master Car Builders' Committee, C. H. Benjamin, Professor of Railway Engineering, Purdue University, Lafayette, Ind., reported in part as follows:—

BRAKE SHOES.—Tests were conducted upon the M.C.B. brake shoe testing machine. The shoes tested were of 6 different kinds. selected from the 7 kinds reported in 1911, each as follows:—

Two plain cast iron, received from the Pennsylvania Rd., length on arc, 14 ins.; width, 3⅜ ins.; thickness, 1½ in.; no insert; reinforced with steel back. Two Spear-Miller, received from the Chicago, Burlington and Quincy Rd., length on arc, 13½ ins.; width, 3⅜ ins.; thickness, 1¾ in.; two V-shaped inserts; reinforced with a steel back. Two National, received from Chicago, Milwaukee and St. Paul Ry., length on arc, 14 ins.; width, 3⅜ ins.; thickness, 1⅝ in.; chilled ends, and reinforced with a steel back. Two Diamond S Christie, also known as a half-flange type, having a flange of 2½ ins. at each end of the shoe, received from the Southern Pacific Rd., length on arc, 14 ins.; width, 4 ins.; thickness, 1½ in.; insert composed of a bundle of expanded metal, covering the entire face; reinforced with a steel back. Two U shoes, received from the New York Central Lines, length on arc, 15¾ ins.; width, 3⅜ ins.; thickness, 1⅝ in.; ends tapered and chilled; reinforced with a steel back. Two Pittsburg, from Pennsylvania Rd., length on arc, 14 ins.; width, 3⅜ ins.; thickness, 1⅜ in.; made up of a pressed back, ⅛ in. thick, completely filled with a composition filler.

Each shoe was tested upon a steel-tired wheel under the following brake shoe pressures:—12,000, 14,000, 16,000 and 18,000 lbs., the initial speed of the machine being in each case 65 m.p.h. At each of the above pressures nine stops were made.

In anticipation of a test the shoe was given a number of applications until a full bearing surface was obtained, after which it was accurately weighed upon a pair of scales. The shoes were first tested at a pressure of 12,000 lbs., after which the pressure was increased by increments of 2,000 lbs. until a pressure of 18,000 lbs. was reached, or until the shoe broke or became unserviceable. The loss in weight of the shoe was obtained by weighing the shoe after each three applications, thus giving a check upon the loss for each pressure. Between each application the shoe was cooled by a blast of air until the temperature was reduced to such an extent that the observer could bear his hand upon the shoe.

The results are plotted in figs. 1 to 3 It will be seen from fig. 1 that the coefficient of friction of most of the shoes decreased as the pressure increased, the two exceptions to this being the plain cast iron and the National. The plain cast iron gave almost the same coefficient at all pressures, while the National gave almost the same coefficient at the three lower pressures and then made a sudden drop at 18,000 lbs. The loss in weight, due to wear, fig. 2, shows that in the case of four of the different types of shoe tested, the loss increased as the pressure increased up to 16,000 lbs. With two of the kinds of shoes tested the loss reduced at 18,000 lbs. This seemingly inconsistent result may be accounted for by the fact that two of the shoes, National and Spear-Miller, broke during the tests at 16,000 lbs., increasing the wear for a time at least, and possibly decreasing the wear when the broken shoes had again been worn to a new fit before the 18,000 lbs. pressure. Two of the types, the Diamond S and the Pittsburg, showed a tendency to reduce the wear as the pressure was increased up to 16,000 lbs., but increased at 18,000 lbs. pressure. No doubt this reduction in loss was due to a change in the per cent. of insert in contact or a change in the physical makeup of the shoe.

It will be seen from a study of fig. 1 that the coefficients of friction of five of the different types of shoes tested fall somewhat close together, but not nearly so close as they did in the tests conducted at 80 m.p.h., reported in 1911. In 1911 the variation was less than 2 in the value of the coefficient of friction in per cent. at any pressure for all shoes tested, with the exception of the Pittsburg. From the results reported this year at 65 m.p.h., it will be seen that this variation is considerably more, being as much as three or over at the different pressures. The coefficient of friction in 1911 was never over 10% nor under 7%, an average for all shoes with the exception of the Pittsburg being approximately 8.4, while in the tests this year at 65 m.p.h. the maximum was 13.3 and the minimum 10% for all but the Pittsburg. The average coefficient of friction at 65 m.p.h. was 12.2, thus making it greater by 3.8 than it was at 80 m.p.h. The Pittsburg in 1911 at 80 m.p.h. varied in a straight line from 19.75% at 12,000 lbs. to 17.1% at 18,000 lbs. It will be seen from the tests made this year that the coefficient of friction of this shoe was less at 65 m.p.h. than at 80 m.p.h. It will also be noted that the loss of weight in the Pittsburg was more at 65 m.p.h. than at 80 m.p.h. In 1911, the average loss at 80 m.p.h. was 2.8, while this year the results at 65 m.p.h. showed a loss of 3.2. This apparent inconsistency in the coefficient of friction and loss in wear of the Pittsburg may be accounted for by the fact that the shoe is made of a composition filler, and as the shoes have been lying in the laboratory for three years where the temperature was 70 degs. or more, the binder which holds the filler together may have dried out, thus reducing the coefficient of friction and increasing the wear.

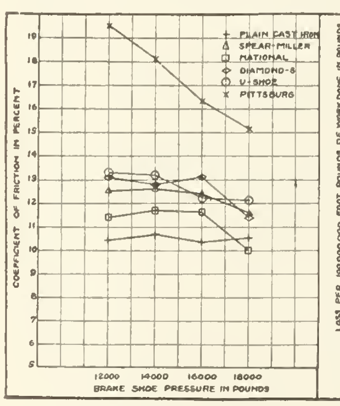


Fig. 1.—Average Co-efficient of Friction of Each Kind of Shoe.

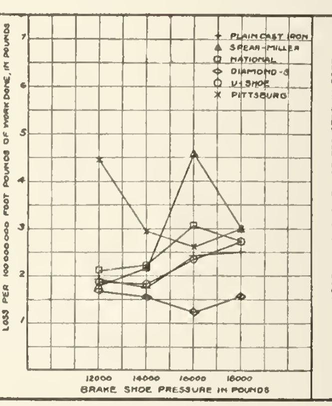


Fig. 2.—Average Loss per 100,000,000 ft.-lbs. of Work Done for Each Kind of Shoe.

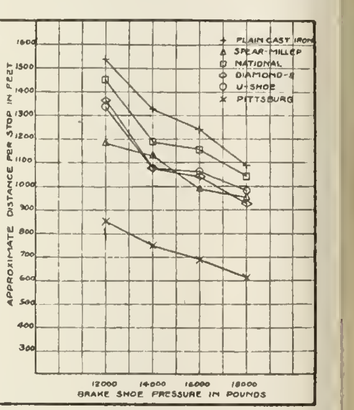


Fig. 3.—Approximate Distance per Stop in Feet for Each Kind of Shoe.

The results given in fig. 3 show that the approximate distance per stop was inversely proportional to the coefficient of friction, all of the metallic shoes varying about the same as for coefficient of friction, and this variation is greater at 65 m.p.h. than at 80 m.p.h., as in 1911. The Pittsburg made stops at approximately half of the distance required by the poorest metallic shoe.

BRAKE BEAMS.—The following change in specifications for no. 2 brake beams is recommended: Apply an initial load of 12,000 lbs., then reduce to 500 lbs.; reset the deflection instrument to zero. Apply a

test load of 12,000 lbs. and under this load measure the deflection, which is desired to be 1-16 or 0.0625 in., but should not exceeed 0.07 in. The beam must then be loaded to 24,000 lbs., after which the set shall not exceed 1-100 in. The brake beam shall stand a total motion of the head of the machine of not less than 2 in. without failure at any point. This change is recommended because it is more in accordance with engineering practice to determine the strength and stiffness of structures at or below the elastic limit rather than to determine the load which will produce actual failure or destruction, it being understood that no part or structure will safely withstand repeated stresses above the elastic limit. It is apparent that the latter forms the proper criterion for safety. It is assumed in the above specifications that 12,000 lbs. represents the maximum working load and 24,000 lbs. the load corresponding to the elastic limit of the beam, corresponding respectively to approximately 15,000 and 30,000 lbs. fibre stress.

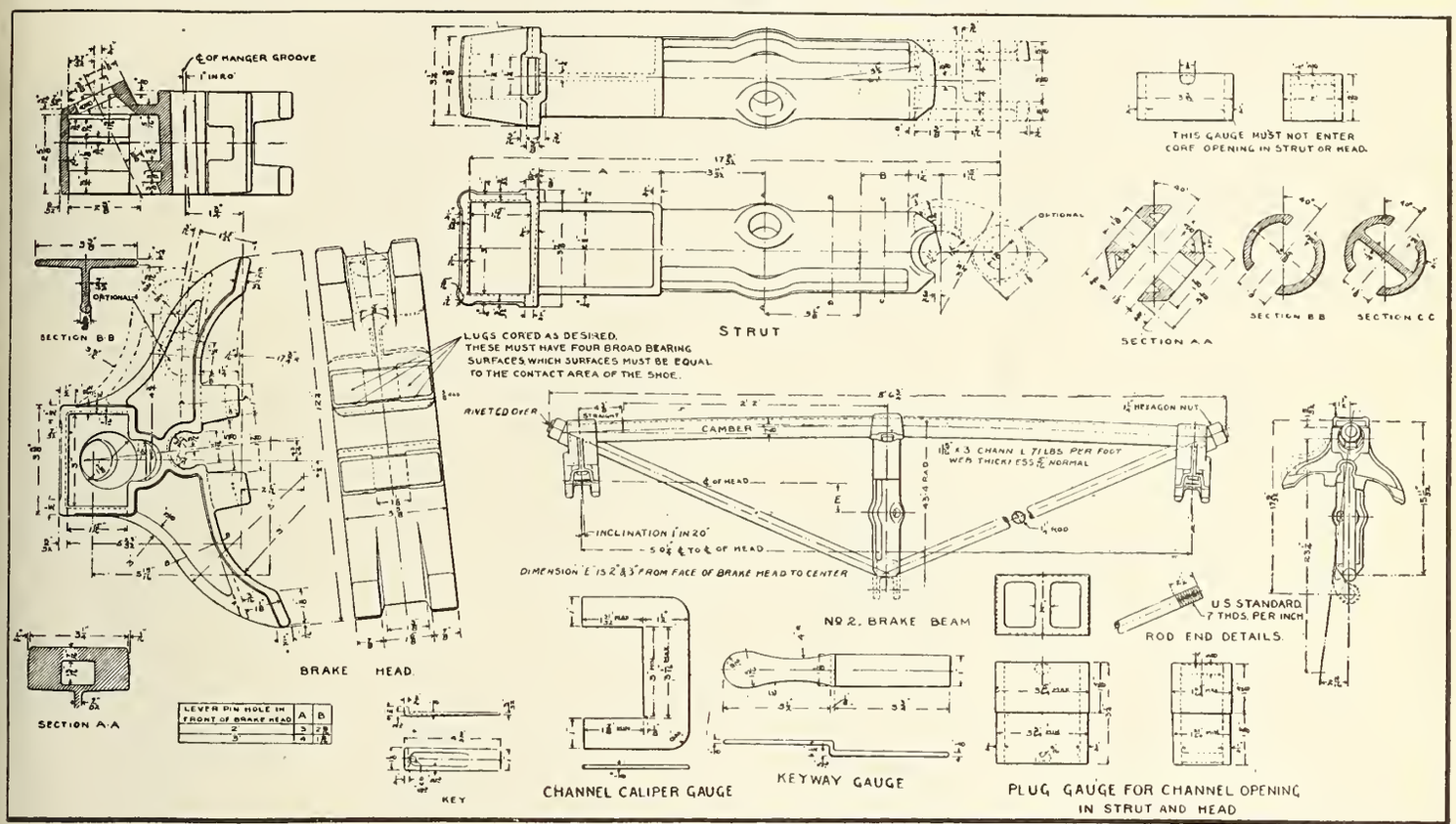
Consideration of the desirability of adding to the specifications a limitation as to the minimum weight of heads and struts allowable show a considerable variation in weights of struts and heads, due largely to variations in design. The Pennsylvania Rd. reports 9 lbs. for the head and 11 lbs. for the strut as a fair average. The list furnished by a firm which supplies nearly half a million brake beams to nine different railways shows head varying from 9 to 11 lbs. each and struts varying from 9 to 12 lbs. each, with an average of about 10 lbs. for either head or strut. Prof. L. E. Endsley has called attention to the fact that, while the average distance between compression and tension members is about 12½ ins., there is some variation in this length which would affect the strength of the strut. In other words, longer struts would need a greater weight for the same strength.

It is believed that some specification which shall define the strength of these two important members should be added to the other specifications, but that specifying a minimum weight would not be sufficiently definite.

The subject of a standard no. 2 brake beam for recommended practice was reopened by a letter of inquiry, which, with replies, is as follows:

Is it desirable at this time to adopt a standard no. 2 brake beam as recommended practice? 22 yes; 8 no. If so, would you consider the beam in sheet M.C.B. 17-B a suitable standard for this purpose? 19 yes; 11 no. If you deem the proposed standard unsuitable, please indicate your reasons. 5 prefer the use of present standard dimensions and see no need of standard detail; 5 do not like the design proposed, and consider it inferior to some now in use. It is recommended that this beam be adopted as recommended practice.

About 75% of the defective brake beams found on the Pennsylvania Rd. were removed on account of worn brake heads, indicating that if beams were properly hung and the locations for hanger holes and hanger brackets were standardized, a large number of failures could be prevented. Failure of the compression and tension members is further shown to be due largely to poor fits between the heads and struts and the other members. In other words, it is apparent that a more careful standardization of brake beams would result in a much smaller percentage of failures and much less expense to the railway companies.



Sheet M. C. B. 17B Recommended No. 2 Standard Brake Beam with Details.

Report of Committee on Smoke Prevention.

The American Railway Master Mechanics' Committee, E. W. Pratt, Assistant Superintendent of Motive Power, Chicago and North Western Ry., chairman, reported in part as follows:

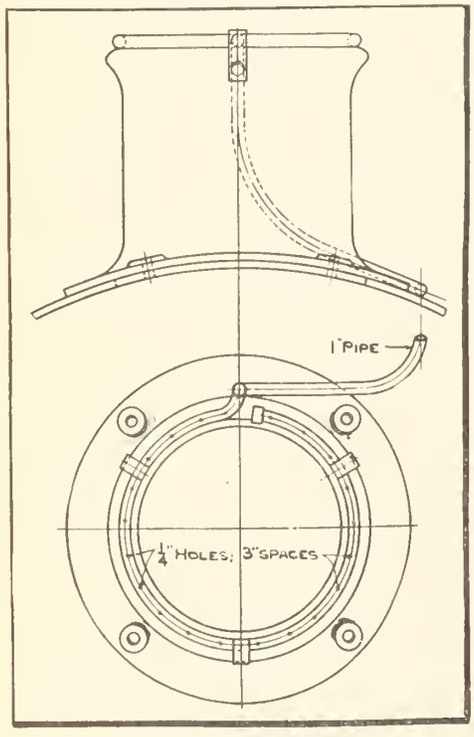
A set of five questions was submitted to members, and answers were received from 25 lines, representing nearly 32,000 locomotives.

Four roads having 4,000 locomotives have complete equipment according to M. M. recommendations and are having excellent results. Seven have installed no devices, one on account of using fuel oil entirely. One finds no particular value in the quick opening blower valve as a smoke reducer, but agrees that the other recommendations are smoke reducers. One, after extended tests of quick opening blower valves, finds that the smoke can be eliminated 33% quicker with such valve in use, and as a result of its tests it has decided to adopt quick opening blower valves. Several others agree that its use is effective, especially when unexpected stops are made. Fifteen with about 18,500 locomotives have installed jets and consider that with ordinary handling these are undoubted smoke reducers. Side installations appear to be more in favor than back head, and are also less expensive; one large road considers that with side installations the jets nearest the front of the fire box are most effective. Two with over 1,000 locomotives, report that arches effect a smoke reduction while working, but produce no noticeable effect while standing. One with over 1,800 locomotives reports the application of side jets and blower to all its locomotives switching or running into Chicago, and the extension of such application to all switchers and a large proportion of all road locomotives on its entire line; the quick opening blower valve was applied to only a small portion of these.

Only seven roads, with about 10,000 locomotives, have tried any special devices other than those recommended. Two refer to a different style of arch with a combustion chamber; one considers that the mechanical stoker which it is using, when working properly, is an excellent smoke reducer. Two have tried other devices without success.

One, with about 1,600 locomotives, reports considerable success with the Bates baffle fire door and Heffron draft regulator. Another large road has attained considerable success by using a ring blower at the top of the stack; claim is made of almost complete elimination of the smoke on the road and the prevention of smoke trailing into the cab; cost is about $7.75; the device is shown herewith. One reports the application in the corners of the fire box of special castings from which steam and air are admitted above the fire, and stated that the apparatus was an apparent success, though no figures were submitted. Another road reported trial of this system with less degree of success than with the apparatus according to the committee's recommendations.

Only one large road has tried any special devices for handling locomotive house smoke. One other large road is about to try a device and still another has the matter under consideration. The special device referred to is the smoke washing plant of



Smoke Lifting Blower.

the Lake Shore and Michigan Southern Ry. at the Englewood locomotive house, Chicago. As this smoke washer was installed in the nature of an experiment, it is impossible as yet to give reliable figures on the cost of such a plant or its operation.

Three large roads, having about 4,500 locomotives, consider that there is no reduction of smoke, due to the superheater alone, all other conditions of operation being the same. Two believe that when locomotive is properly worked, less smoke will be produced with a superheater than without it; this is merely an opinion and not the result of scientific observation. Five believe that there is a reduction in smoke corresponding to the reduction in coal burned. Tests were conducted by the Pennsylvania Rd. at the Altoona testing plant, with both freight and passenger locomotives equipped with superheaters against the same type of saturated steam locomotives. The superheater in freight service effects an undoubted reduction in smoke under the same working conditions. In passenger service, however, a superheater produces more smoke at the low burning rates, while there is a reduction in smoke at the high burning rates. The Schmidt superheater appears to be in almost universal use, a few Cole superheaters being the only other ones reported. The fuel economy of the superheater varies from 12 to 35%. One important road reports a saving of as high as 40% in the average number of pounds of coal used per car handled in switching service.

One road reports smoke reduction by the use of a ring blower hung inside the stack in a horizontal position in firing up locomotives in the locomotive house. Another claims to have reduced smoke about 30% by leaving the jets on. Three large roads have tried different methods of firing-up, with the results that with fuel oil and shavings, atomized fuel oil, oil and engine wood, the last named produced the least smoke and was cheapest, the cost being about $1 per locomotive. With briquettes, cost about $1.50; soft coal, $2.09; coke, $4.26; briquettes gave as little smoke as coke, and yet are the cheapest of the fuels tried. Another finds that by putting coal on the grates and wood on top that less smoke is produced, but cost figures were not given, and it is believed that this method is more injurious to the grates, especially with coal that clinkers badly. Another large road, after considerable investigation, has adopted firing-up with scrap waste, crude oil, wood and coal in quantities, waste, 1 lb.; crude oil, ½ pt.; old car siding, ½ cord; coal, 300 lbs.; the method employed is to saturate the waste with the crude oil and throw it in on the grate, after being ignited; on top of this, in small bunches, is thrown the wood, and when the wood gets burning well six to eight scoops of coal are added; then in about 30 minutes more coal is added.

From the numerous reports outlined the committee finds that the application of the apparatus recommended by them last year has proved successful in extended practice toward the elimination of smoke in steam locomotives and suggests its more general adoption.

Report of Committee on Standardization of Tinware.

The American Railway Master Mechanics' Committee, M. D. Franey, Master Mechanic, Lake Shore and Michigan Southern Ry., chairman, reported in part as follows:—

During 1911 a very complete paper on standardization of tinware was presented to the Railway Storekeepers' Association. The committee which compiled the report collected the data from practically all of the leading railways, giving the dimensions of the various tinware used in their respective departments, this to include articles manufactured from galvanized iron. Your committee has received some very valuable suggestions from the Storekeepers' Committee, though we have confined ourselves to tinware included in the locomotive department only.

We cannot hope to present dimensions that will be adopted by each of the railways. Many now have their standards; for various reasons they do not wish to depart from them. There are railways, however, that have not adopted a standard, and while the committee has studied principally the method of construction and the material to be used, it has also selected the dimensions that in its judgment will be most suitable for the service for which each article will be used. This is probably as close as we can ever expect to come to a standard on tinware. As an illustration, it is well known that a tank bucket has to withstand very severe usage. For this reason your committee is recommending a tank bucket with a bottom of very small diameter, designed with a specially formed wire guard fastening the bottom in place. The bottom of the bucket is also depressed so that it can set over a projection without injury. This form of construction will very successfully withstand the service and the force of a blow to which the tank bucket is subjected.

Your committee has endeavored to reduce the number of articles used to a minimum, and it finds that a number of roads get along with the articles mentioned in this report. It has not included headlights, cab lamps, lanterns or markers, as it finds most roads purchase these articles from manufacturers. Very few railways have detailed drawings of these articles, or manufacture themselves. It might be of interest to review some of the commercial terms applied to the tin used in construction. The plates are referred to as coke tin, charcoal tin and terne plates.

COKE TIN PLATES.—The base of these plates is the best soft steel, made especially for tin plating. The word "coke" is a trade term, indicating finish, retained from the time when high grade tin plates were made from charcoal iron and lower grades from coke iron; hence, plates with lighter coating are called coke tin plates. Tin plates are generally packed in boxes, and the unit of value and measurement is known as a base box, which is 112 sheets of 14 by 20 ins., or 31,360 sq. ins. of any size.

No.	Lbs.	No.	Lbs.
38	55	31	90
37	60	31	95
36	65	30½	100
35	70	30 IC	107
34	75	29	118
33	80	28 IX	135
32	85	28 IXL	128
28 DC	139	25 4X	195
27 2X	155	25 4XL	188
27 2XL	148	24 D2X	210
26 3X	175	23 D3X	240
26 3XL	168	22 D4X	268
26 DX	180		

CHARCOAL TIN PLATES.—The base metal of these plates is specially prepared with a view to securing a high gloss and fine working quality. The trade term "charcoal" is referred to in the description of the coke finish. It is customary to distinguish the amount of coating and degree of finish by letters 1-A, 2-A, etc., up to and including 5-A. 1-A grade has the least amount of coating, and each A signifies an additional quantity. One of the leading manufacturers gives the following tabulation for various brands, showing the approximate weight of coating on both sides of the sheet per base box of 112 sheets, 14 by 20 ins.; for 112 sheets, 20 by 28 in., the weight of coating would be double that shown in the table:

1-A Charcoals	3 lbs.
2-A Charcoals	3½ lbs.
3-A Charcoals	4 lbs.
4-A Charcoals	5 lbs.
5-A Charcoals	6 lbs.
Premier	7 lbs.

It recommends the Premier brand as suitable for all high-class work, such as nickel plating.

TERNE PLATE, generally known as roofing tin, is made by coating steel or iron sheets with a mixture of approximately 25% tin and 75% lead. These plates are made from copper bearing open hearth steel. The manufacturers claim that steel of this character amalgamates with the tin and lead mixture in such a manner as to produce a better plate than is possible with ordinary steel, and as a consequence resists corrosion to a remarkable degree. It is also as soft as the best charcoal iron. Practically all of the roofing tin made prior to 1890 was produced by the palm oil process, but it is

claimed that plates made in the 90's by the acid process are still in use and giving good service, manufacturers claiming they are fully as good. It is important that the mixture covers the iron and adheres to every point; otherwise, there are liable to be what are known to the trade as pinholes, which are injurious and permit corrosion to start. Terne plates, like the other grades, are packed in boxes which show the style of finish, the grade of the plate and the amount of coating. The process of manufacturing does not produce all perfect sheets, which are designated by the mill as prime plates. A small percentage of the manufactured plates contain pinholes or other defects, and are called wasters.

The report terminated with a series of drawings and descriptions of 20 standardized parts, including the following, in some cases in different sizes; Engineer's torch, oil cans of different kinds, card case and buckets.

Report of Committee on Superheater Locomotives.

The American Railway Master Mechanics' Committee, H. H. Vaughan, Assistant to Vice President, C.P.R., reported as follows:

The committee has made an investigation in connection with packing rings, etc., in view of the widely varying results which are reported in locomotives using superheated steam, and have also the privilege of presenting to the Association the results of the experiments made by the Pennsylvania Rd. on their testing plant at Altoona, on the tests of a class K 2, s a locomotive and on the effect of various changes in the form, length and extent of heating surface of a Schmidt superheater.

The test on a class K 2, s a locomotive has been printed and issued as Bulletin 18, by the Pennsylvania Rd., and the committee recommends that it be reprinted in the Proceedings of the A. R. M. M. A., in the same way that the report on the test of a class E 6 s locomotive was reproduced in the 1913 Proceedings.

The tests on a Schmidt fire tube superheater showing the effect of various changes in its form, length and extent of heating surface are presented as part of this report. This test is valuable as indicating the effect of changing the length of the superheating pipes, and the possibility of obtaining results with the return loop shortened which are equal to those with a full length return loop. The tests have been carried out in the thorough manner usual on the Pennsylvania Rd., and this Association is indebted to their general superintendent of motive power, Mr. Wallis, for permission to present them.

In connection with packing rings, 20 roads were written operating about 5,500 superheater locomotives, and the replies may be summarized as follows:—There is a large variation in the life obtained from piston packing rings, the replies giving from two or three monts of 6,000 miles, to as high as 50,000 miles or two years. Roads representing about 25% of the locomotives use a special mixture for piston packing rings, but while most of those who do so report from 50 to 100% longer service from special irons than from ordinary gray iron, the latter is used by those roads reporting the longest life in service. In several cases cylinder iron is used with 1.20 to 1.50% of silicon—the prosphorus also being kept low, not over 0.5%, and with apparently good success. There is, however, considerable variation between different classes of engines, in some cases the life reported in passenger service being double that in freight, while in other cases the reverse occurs. The longest life reported is with the plain ¾ in. square ring which is used by the majority of the roads; but one road using ⅜ in. by ⅝ in. rings reports a decided improvement as against the ¾ in. wide ring, and exceedingly good results are reported by the Leighton balanced ring, which is a special design and used by the Illinois Central.

The great variation in the life is peculiar, as there does not appear to be any explanation of the wide differences reported. The average life for all locomotives represented is five months, and this figure compares very closely with results reported by several roads that have gone into the matter carefully. It is generally suggested that ample lubrication and the use of the dritting throttle are the requirements for long life, but apart from these suggestions there is nothing to explain the variations.

The majority of the roads have used extended piston rods to some extent with improved results in most cases, especially on large cylinders, 23 in. diameter and over. Replies would indicate that if of proper design this attachment is undoubtedly an advantage, the only question being one of maintenance.

The life of piston valve rings also shows a wide variation from as low as two months to as high as two and even three years. There is no correspondence between the life reported for piston packing rings and valve rings, in many cases roads reporting a long life for piston rings, reporting a short life for valve rings and vice versa. The average life reported is slightly over 13 months. It is apparently but slightly affected by the material used, but several roads refer to the necessity of boring out the bushing in position to obtain good results. Very little trouble is experienced in the case of piston valve bushings and there is evidently no serious difficulty in the maintenance of these parts.

Most roads use special types of rod packing, and with a good design there seems to be no difficulty in obtaining a life of 10,000 miles or over, with the 80% lead, 20% antimony mixture. Where this has given trouble on account of severe service and on the high pressure cylinders of Mallet engines, a mixture of 50% copper, 50% lead has been used to advantage. One road reports improved results on Mallet engines from a mixture of 33% copper, 67% lead, but the 80-20 mixture is the one most used and is evidently satisfactory in the majority of instances.

W. H. FLYNN, Superintendent of Motive Power, Michigan Central Rd., in the course of the discussion, said:—We have been safe ending the superheater tubes and getting excellent results from them. We build in one locality safe ending in the front end and in another the rear end, but for economic and other reasons we decided to weld only on the front end. On one division where we have continuous, high speed service we have been endeavoring to find something that will improve the service obtained from our cylinder packing. At the present time we are experimenting with graphite lubrication in conjunction with oil lubrication, and our results so far have been very gratifying.

E. R. WEBB, Master Mechanic, Michigan Central Rd., St. Thomas, Ont., said:—With superheater locomotives, and in that heavy, high speed service, we found it was necessary to inspect the packing every 30 days, and one of the amusing things that was found was that the cylinders did not wear; the wear seemed to all come on the packing and pistons. We use a 1¼ in. packing, 15-16 or 31-32 in. wide. It was found also, in the use of the Dunbar packing, with both the square and the other section, that the wearing surfaces would be of the same dimensions. I believe that it will be found that where the packing runs ordinarily more than 15,000 or 16,000 miles the temperature of the superheater is not very good for it. As regards the cylinder lubrication, we believe it to be necessary on superheater engines. With the graphite lubrication, we found that cracked piston rods have practically disappeared. The examinations which the superheaters receive in the roundhouse are what determine whether they shall be successful or not. It has been found that it is quite necessary to keep the flues open to inspect the front ends and to keep the boiler tight. The superheater has made it possible to operate our service with a 22 in. by 26 in. engine, that otherwise could not possibly handle the business. The man who cleans the flues and the man who calks the flues—the men who take care of these things are really the important and vital fellows.

H. H. Vaughan on the Car Construction Committee's Report.

In the discussion of the report of the committee on car construction (see pg. 294 of this issue), H. H. Vaughan, Assistant to Vice President, C.P.R., said:—

I advised the chairman, Mr. Kiesel, that I realized it was unfair at the time the report was written to interpose objections, but in some respects I did not consider the report satisfactory. My objections are as follows: I cannot subscribe to the recommendation on centre sills for new cars. I am inclined to agree that the two standards I recommend would not be practical, and therefore consider that the decision must be left to each road individually. From experience gained with 30,000 cars, having 19.8 sq. ins. of centre sill area, I do not consider results would warrant this area being increased for the class of traffic in which these cars are usually employed, while roads on which exceedingly heavy trains are handled may find it desirable to employ heavier construction at the expense of heavier dead weight. Until the time arrives at which interchange requirements demand a minimum strength of centre sill, it therefore appears useless to specify the dimensions for new cars.

End construction for new cars with two vertical 4 in. Z bars and 1¾ in. wood end lining has proved satisfactory, and is ample as a minimum requirement. I would therefore recommend the report be amended to read "New steel cars should have steel plate ends 1¼ in. thick, or wood lined ends 1¾ in. thick," etc., and that the statement regarding alternative arrangement be omitted. Bending strength of the braces should be specified at a definite height above floor line. It is unnecessary to provide end fastenings which are equal to the shearing strength of the braces.

I do not consider it desirable to specify patended type of ends, as these could better be provided for by saying that special design of ends should be equal in strength.

Under the heading of Car Doors and Fastenings, angles should be located not over 12 ins. from top and bottom of door to provide for construction in which these angles or their equivalent is used as part of door frames. They should be used with ⅜ in. carriage bolts, or ¼ in. rivets.

The recommendations on draft gears should permit cars to be transhipped at option of receiving road in place of forbid-

ding their acceptance in interchange. The draft timbers should be held securely to the centre sills, end hills and dead wood by not less than six ⅞ in. bolts or five one inch bolts. Size of draft springs should be specified in place of capacity. I consider that a clause should be drafted specifying the condition of draft gear and sills, as this is more important than the dimensions. I do not consider that recommendations for repairs are advisable, as it is not apparent what object would be attained by them.

JAS. COLLINSON, Superintendent, Car Department, G.T.R., said:—There are some railways which have a large number of cars with less area than required by this report, and I do not think it is fair to adopt this report, as it would almost cripple some of the railways which have a large number of these cars in service.

H. H. VAUGHAN, after some further discussion, said:—I think the report of the committee should be received, and I would be very glad if the association would receive my report as a minority report. The report as a whole demands varied action. As to some portions relating to the minimum strength of draft gear on cars in interchange, that portion should be referred to the arbitration committee for their consideration. Another portion of the report, the strength of centre sills on new cars, may be submitted to letter ballot as recommended practice. I do not think any action should be taken on the report as a whole.

And further on in the discussion Mr. Vaughan said:—It may be that referring this report to letter ballot for adoption as recommended practice will make a progress report for it, but it also does something more: it puts the stamp of approval of the association on certain required limits for new cars, and any road that builds cars which do not come up to that minimum is more or less subject to criticism. Four years' experience with cars having two 15 in. channel centre sills, properly reinforced with a bolster, but without a continuous cover plate, has shown excellent results in service, and the cars have not sustained sufficient damage in interchange service to justify us in adding 500 lbs. of weight. I have figured that 500 lbs. of added weight adds $6 a year to the cost of pulling the car around. I do not want to add that cost unless it is necessary, and I cannot see that it is at the present time.

C. E. CHAMBERS, Central Rd. of New Jersey, took issue with Mr. Vaughan as to the matter of cars in service of four years. He did not think that sufficient time in which to decide whether a car was strong enough. During that time the sills had not commenced to deteriorate, but during the next four years there might be considerable weakness displayed in them.

Finally it was decided to refer the paragraphs under discussion to the incoming executive committee to dispose of.

The Use of Electric Motors in Railway Shops.

In delivering at the A. R. M. M. convention the individual paper on this subject, which appears on pg. 307 of this issue, two of the Michigan Central Rd. officials referred to its new shops at St. Thomas, Ont.

E. R. WEBB, Master Mechanic, St. Thomas, said: Being connected with probably the very latest new shops that are being electrically equipped, I can certainly agree with all of the statements in the paper. We find that in going from the shaft drive to the individual motor drive, and from the group drive to the individual drive, the advantage is very great.

W. H. FLYNN, Superintendent Motive Power, Detroit, said: We have recently built a new shop, which is electrically equipped throughout. We have had considerable experience with electricity in our shops at Jackson, Mich., but our first installation there was the group system. Since that time we have recognized the disadvantage of the group system, which entailed the use of a lot of belts, and our later purchases have been largely confined to individually driven machinery. In our St. Thomas shops we have gone to the individual group system to a slight extent, partly from the standpoint of economy, and partly also from an economical arrangement of the tools, but in large installations I am in favor of the individual system. We have had an experience in building a new shop, and also trying to modernize a car shop by using electricity and centralizing the power into one power plant, and benefits are already apparent. We are going to operate one power plant at a less cost to supply a considerably greater amount of power than we previously operated two power plants.

J. K. DEVOY, Chicago, Milwaukee and St. Paul Ry.: Has Mr. Flynn any information as to what he has saved by changing from group to individual drive, and if he has made up his mind as to how low he would go in size of a motor for individual machines?

W. H. FLYNN: We have been governed largely by the results which we have obtained, and while we have not any definite recommendations to make at this time, we are studying that now. We find that some small machines, where they are running constantly, can be grouped and run by a 7 or 10 h. p. motor, with very economical results, but we ran up against the question of power factor at Jackson. We were getting very poor results and we found it necessary to make some changes in grouping, abandoning some of the group drives in order to get more efficiency.

Disposition of Committees' Reports at Atlantic City.

MASTER CAR BUILDERS' ASSOCIATION. The reports of the committees on rules of interchange, prices for labor and material, coupler and draught equipment, overhead inspection of box cars, and damage of freight car equipment by unloading machines, were approved in full.

The reports of the committees on car wheels, loading rules, car trucks, train lighting, tank cars, specifications and tests for materials, car construction, and retirement of 40,000 and 50,000 capacity cars were accepted, to be referred to the members by letter ballot.

The reports of the committees on brakeshoe and brakebeam equipment, revision of standards and recommended practice, and train brake and signal equipment, were amended, and will be referred to the members for letter ballot.

The report on car construction was referred to the incoming executive committee, to dispose of the paragraphs to which exception was taken by H. H. Vaughan and others.

L. C. Ord, Assistant Master Car Builder, C.P.R., Montreal, took part in the discussion of the report on train brake and signal equipment, and moved that sec. 3, concerning the cording of conductors valves, be referred back for further consideration. This and other amendments carried.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION. The reports on locomotive stokers and locomotive head lights were adopted.

The committee on standardization of tinware was continued and requested to bring in a report next year with recommendations for standards for all classes of tinware now in use.

The report on train resistance and tonnage rating was referred back to the committee for further investigation.

The reports on smoke prevention and fuel economy were adopted, and the committees were both continued and made standing committees.

The report on revision of standards and recommended practice was referred to letter ballot, with the exception of the sections on maximum and minimum flange, thickness, gauge and rearrangement of specifications, which were referred back to the committee for further action next year.

The report on laboratory and road tests for locomotives was referred to letter ballot for recommendations as to standard practice.

In connection with the report on train brake and signal installation, which was also submitted to the M.C.B. Association, similar action was taken by both associations, it being decided to omit the questions and answers from the proceedings, that the air brake and train signal instructions be submitted to letter ballot and that the new train signal be returned to the committee for further investigation.

Election of Railway Mechanical Associations' Officials.

The following elections took place at Atlantic City:

Master Car Builders' Association.—President, D. F. Crawford, General Superintendent of Motive Power, Pennsylvania Rd.; First Vice President, D. R. MacBain, Superintendent of Motive Power, Lake Shore and Michigan Southern Ry.; Second Vice President, R. W. Burnett, General Master Car Builder, Canadian Pacific Ry.; Third Vice President, C. E. Chambers, Superintendent of Motive Power, Central Rd. of New Jersey; Treasurer, J. S. Lentz, Master Car Builder, Lehigh Valley Rd.; Executive Committee, R. E. Smith, General Superintendent of Motive Power, Atlantic Coast Line Rd., J. C. Fritts, Master Car Builder, Delaware, Lackawanna and Western Rd., and H. T. Bentley, Superintendent of Motive Power and Machinery, Chicago and North Western Rd.

American Railway Master Mechanics' Association.—President, F. F. Gaines, Superintendent of Motive Power, Central of Georgia Ry.; First Vice President, E. W. Pratt, Assistant Superintendent of Motive Power, Chicago and North Western Rd.; Second Vice President, W. Schlafge, General Mechanical Superintendent, Erie Rd.; Third Vice President, F. H. Clark, General Superintendent of Motive Power, Baltimore and Ohio Rd.; Treasurer, Angus Sinclair, Editor, Railway and Locomotive Engineering; executive members for two years, C. F. Giles, Superintendent of Machinery, Louisville and Nashville Rd., M. K. Barnum, General Mechanical Engineer, Baltimore and Ohio Rd., J. Purcell, Assistant to Vice President, Atcheson, Topeka and Santa Fe Ry.

Railway Supply Manufacturers' Association:—President, J. W. Johnson, Pyle National Electric Headlight Co.; Vice President, O. F. Ostby, Commercial Acetylene Railway Light and Signal Co.; Executive Committee, Third District, C. E. Postlethwaite and P. J. Mitchell, Fifth District, G. H. Porter, and Sixth District, F. E. Beal.

The Palliser, the C.P.R. hotel at Calgary, Alberta, was opened for business June 1. It has 315 rooms for guests, of which 278 are provided with baths.

Canadian Railway Officials at Atlantic City Conventions.

Among the Canadian railway officials, etc., in attendance were the following:—

CANADIAN PACIFIC RY.—H. H. Vaughan, Assistant to Vice President; R. W. Burnett, General Master Car Builder; H. Osborne, Assistant Mechanical Superintendent; W. E. Woodhouse, Superintendent of Motive Power; L. C. Ord, Assistant Master Car Builder; G. I. Evans, A. Dixon, Superintendents of Locomotive Shops; W. H. Winterrowd, Mechanical Engineer; H. C. Griffin, General Car Inspector; J. Burns, J. H. Mills, H. G. Reid, Master Mechanics; E. Eley, E. M. Wood, Divisional Car Foremen; R. V. Carleton, General Car Foreman.

GRAND TRUNK RY.—W. D. Robb, Superintendent of Motive Power; J. Coleman, Superintendent of Car Department; J. Markey, R. Patterson, Master Mechanics; A. Copony, J. Hendry, T. A. Treleaven, Master Car Builders; J. Powell, Chief Draughtsman, Motive Power Department; K. F. Nystrom, Chief Draughtsman, Car Department.

A. L. Graburn, Mechanical Engineer, Canadian Northern Ry.; T. A. Summerskill, Superintendent of Motive Power, Central Vermont Ry.; W. Gillespie, Master Car Builder, Central Vermont Ry.; J. L. Hodgson, Master Car Builder, Grand Trunk Pacific Ry.; W. T. Kuhn, Superintendent of Motive Power, Toronto, Hamilton and Buffalo Ry.; W. H. Flynn, Superintendent of Motive Power, Michigan Central Rd.; E. R. Webb, Master Mechanic, Michigan Central Rd.; H. J. White, General Car Foreman, Canadian Northern Quebec Ry.; J. V. Ware, Chief Clerk to Master Mechanic, Canadian Northern Ontario Ry.; J. Ogilvie, Mechanical Expert, Board of Railway Commissioners; A. W. Wheatley, General Manager, and W. Casey and G. Cavin, Canadian Locomotive Co.

Atlantic City Convention Notes.

Jas. Powell, Secretary Canadian Railway Club, Montreal, was among the visitors.

F. W. Morse, formerly of the G. T. R. and G.T.P.R., was among the convention guests.

A. W. Horsey, formerly of the C. P. R. mechanical staff, went over Atlantic City in a hydroplane.

T. McHattie, Master Mechanic G. T. R., Montreal, was unable to attend the A. R. M. A. Convention. He and Mrs. McHattie expect to visit Nova Scotia in July.

Jas. Ogilvie, Assistant Chief Operating Officer, Board of Railway Commissioners, Ottawa, had to leave for home in the middle of the convention, having contracted a severe cold.

A. W. Wheatley, Vice President and General Manager; W. Casey, Efficiency Engineer, and G. Cavin, Assistant Mechanical Engineer, Canadian Locomotive Co., Kingston, Ont., were among the visitors.

G. I. Evans, Superintendent Locomotive Shops, C. P. R., Montreal, was at Atlantic City for the M. C. B. Convention, but was unable to remain for the A. R. M. M. He was accompanied by Mrs. Evans, and her sister, Miss Peel.

R. W. Burnett, General Master Car Builder, C. P. R., acted on the committee on obituaries of deceased members, with special reference to the late G. H. Eaton, formerly Assistant Master Car Builder, Western Lines, C. P. R., Winnipeg.

The registrations of attendance during the conventions was as follows:—Members M. C. B. and A. R. M. M., 631; special guests, 451; ladies, railway, 352; ladies, supply, 272; supply men, 1,403; total, 3,109. The total registrations in the three previous years were, 1913, 3,352; 1912, 2,887; 1911, 4,251.

H. H. VAUGHAN, Assistant to the Vice President, C.P.R., Montreal, while attending the recent conventions, participated in the golf tournament. He was one of eight who tied for the two blind score prizes, two handsome silver cups, and when the winners were decided by lot, he secured the first prize.

Mrs. A. Fenton Walker, Business Representative, Canadian Railway and Marine World, with headquarters in New York, N. Y., was a member of the American Railway Supply Manufacturers' Association's entertainment committee, which had charge of all matters relating to entertainment in connection with the two conventions. She was also a member of the sub committee for the M. C. B. dance on the pier, at which over 700 were present.

In the track exhibit the C.P.R. had an 80,000 lbs. capacity steel frame box car, of its latest design. It weighs 36,000 lbs., and has a structural steel frame with channel centre sills, Z bar framing and horizontal wooden sheathing. The principal feature of difference from the large number of this type on the C.P.R., there being nearly 30,000 in service, is in the new Burnett steel roof, which has been applied to this car. It is of arch shape, without carlines, purlines or ridge pole, the steel sheeting being interlocked at the edges, with cap sections over these interlocked edges on the outside.

Railway Supply Exhibits at the Atlantic City Convention.

As usual there was a very comprehensive display of railway appliances, etc., on the pier, the space occupied by exhibits being 82,000 sq. ft. against 88,222 in 1913 and 83,507 in 1912. Among the principal exhibitors were the following:—

American Brake Shoe & Foundry Co., Mahwah, N. J.—Brake shoes; locomotive driver brake shoes and brake heads; flanged and unflanged passenger coach shoes; unflanged freight car shoes.

American Locomotive Co., New York, N. Y.—Reception booth.

Anchor Packing Co., Philadelphia, Pa.—Air pump and throttle packing; air pump gaskets.

Bird-Archer Company, New York, N. Y.—Samples of Polarized; also samples of tubes from locomotives that have been treated by same.

Boker & Co., Hermann, New York, N. Y.—Nickel clad sheets for car trimmings.—Novo and Novo superior high speed steels; special alloy steels.

Bowser & Company, Inc., S. F., Fort Wayne, Ind.—Gasolene and oil storage systems, consisting of long distance and first floor self-measuring pump and storage tanks. Red sentry enclosed long distance pumps with electric lamp attachment. Complete oil filtration system. Self-registering pipe line measure.

Buffalo Brake Beam Co., New York, N. Y.—Buffalo freight brake beams for all classes and capacities of equipment, including the new proposed M. C. B. beam, also beams for E. & L. equipment. Beams for all classes and capacities of tenders and electrical equipment, for standard, broad and narrow gauge. Buffalo passenger brake beams for all classes of service, including P. C. and L. N. equipment with automatically adjustable heads and safety locks.

Carborundum Company, Niagara Falls, N. Y.—Carborundum and aloxite.

Chicago Car Heating Co., Chicago, Ill.—Vapor system of car heating; car heating specialties; hot water heating specialties.

Chicago Railway Equipment Co., Chicago, Ill.—Brake beams of the PC Creco, EL Creco, Diamond special, Diamond, Drexel, Ninety-Six, Monarch and special types; Creco inverted and economy roller side bearings; brake slack adjuster; automatically adjustable brake head; semi-adjustable brake head; removable leg brake head; Creco sliding third point support and safety device; reversible and duplex brake beam struts.

Clark Foundry Company, Rumford, Maine. Combined punch and shear. Represented by Philo B. Clark and Leslie D. Jannell. Space 137.

Coe Manufacturing Company, W. H., Providence, R. I.—Coe's ribbon gold leaf; ribbon aluminum leaf; Coe's gilding wheels

Commercial Acetylene Railway Light & Signal Co., Inc., New York, N. Y.—Car lighting—acetylene mantle and open flame lamps; Headlight — acetylene headlights, classification and cab lamps; Signals—acetylene lighted signals with the "AGA" flashlight feature; Marine lighting—Buoy valve; Welding-Oxy-acetylene welding equipment.

Consolidated Car Heating Co., Albany, N. Y.—Latest types two-piece steam couplers; sectioned quick opening end valves; packless end valves; sectioned quick opening admission valves; packless admission valves; single and twin pressure traps; single and twin vapor traps; automatic drain valves; sylphon bellows specialties; special steam fittings.

Consolidated Railway Electric Lighting & Equipment Co., New York, N. Y.—The "Axle light" equipment under operating conditions, in connection with lead or Edison batteries; new ampere hour battery charge control; type "L" regulators; Timken and ball bearings. The "Clothel" rotary air compressor.

Dearborn Chemical Co., Chicago, Ill.—Dearborn water treatment for use in locomotive and stationary boilers for the prevention of foaming, corrosion, pitting and scale formation. Waters analyzed and treatment prepared to suit the conditions found.

Detroit Lubricator Co., Detroit, Mich.—Number 22 series of bullseye locomotive lubricators; air cylinder lubricator; emergency valves; air brake lubricator; boiler valves; electrically operated flange lubricator exhibit complete; improved standard lubricator; "500" air compressor lubricator; sectional force feed oiler with cut-away tank packless and multiport valves; transfer filler.

Edison Storage Battery Co., Orange, N. J.—Edison storage batteries for train lighting, railway signals, baggage, freight and mail trucks, multiple unit control, electric incandescent headlights, inspection lamps, etc.

Flannery Bolt Co., Pittsburg, Pa.—Tate flexible staybolts; installation tools for applying Tate bolts; radial and adjustable crown flexible staybolts; "F. B. C." nut locks for freight cars.

Galena-Signal Oil Co., Franklin, Pa.—Reception booth.

General Electric Co., Schenectady, N. Y.—Reception room in which was installed an automatic machine showing lantern slides of machines and installations of interest to delegates attending the convention.

Gold Car Heating & Lighting Co., New York, N. Y.—Car heating systems; combination pressure and vapor; straight steam; hot water, refrigerator storage; electric

heaters; thermostatic control for steam, hot water and electric systems. Pressure regulator; temperature regulators; twin supply valves; steam hose couplers; ventilators; curtain window ventilators; journal boxes, and lids; dust guards.

Goldschmidt Thermit Co., New York, N. Y.—Samples of Thermit welds including a large weld on a 9¼ in. 2 throw crank shaft for refrigerating machine. Materials and apparatus used in locomotive shops for Thermit welding; such as preheaters, cruicibles, mold box, special mixtures of Thermit, etc. Samples of metals free from carbon and numerous photographs and transparencies of Thermit welding operations.

Greene,Tweed & Co., New York, N. Y.—Palmetto, round and square, braided packing; Palmetto twist packing for small valves; packing in sets for air pumps and throttles. Manhattan packing for hydraulic pressures; Favorite reversible ratchet wrench.

Grip Nut Co., Chicago, Ill.—Grip nuts.

Hunt Spiller Manufacturing Corporation, South Boston, Mass.—Cylinder bushings; cylinder packing; piston heads; valve bushings; valve packing; valve bull rings, crosshead shoes; shoes and wedges; driving boxes; rod bushings; knuckle pin bushings; crown bearings; air pump bushings; air pump packing; eccentrics and straps.

Independent Pneumatic Tool Co., Chicago, Ill.—Thor piston air drills for drilling, reaming, tapping, flue-rolling and wood boring; corner drills for use in close quarters; pneumatic riveting, chipping, calking and flue-beading hammers; pneumatic staybolt drivers; Thor pneumatic grinders; Thor electric drills.

Ingersoll-Rand Co., New York, N.Y.—Pneumatic tools, consisting of "Little David" roller and ball bearing piston air drills, for drilling, reaming, tapping and flue rolling; riveting hammers for driving rivets up to 1¼ in.; chipping hammers for all classes of chipping, calking, scaling, flue beading; Imperial air motor hoists—capacity up to 10 tons; Little David jam riveters; Crown holder-ons and Crown bench and floor sand rammers.

Johns-Manville Co., H. W., New York, N.Y.—Asbestos and magnesia material; asbestos cements; pipe coverings; boiler lagging; packings, roofings, waterproofing; mastic flooring; J.-M. expander rings; transite and ebony asbestos wood; absestos shingles; transite asbestos smoke jackets; steel passenger car insulation; refrigerator car insulation; fibre and sectional conduit; electrical materials; J.-M. automatic car seal; flexible armoured hose; Jones speedometers for locomotives and passenger cars; cork tilings; linolite lighting.

Kerite Insulated Wires & Cables Co., New York, N.Y.—Kerite insulated wires and cables.

Locomotive Superheater Co., New York, N.Y.—Electric pyrometer for indicating the temperatures of superheated system; latest design of superheater unit; soft metal grinding process mould.

McCord & Co., Chicago, Ill.—Steel and malleable iron journal boxes; force feed locomotive lubricators.

Norton, Inc., A. O., Boston, Mass.—Lifting jacks.

Pyle-National Electric Headlight Company, Chicago, Ill.—Locomotive electric headlight set and headlight case; type "E" turbo-generating set (arc headlight set); type "S" turbo-generating incandescent headlight set.

Railway Materials Company, The, Chicago, Ill.—Steel back brake shoe; Ferguson shop furnaces; blue prints.

Railway Utility Co., Chicago, Ill.—Utility honeycomb car ventilators for monitor deck and for arch roof cars; thermometer steam heat regulator; thermometer electric heat regulator; automatic freight car door locks; electric vacuum car cleaners.

Safety Car Heating & Lighting Co., New York, N.Y.—Pintsch mantle lighting equipment; Safety electric car lighting equipment; gas and electric lighting fixtures; oxy-Pintsch metal cutting and welding apparatus; electric fans.

Standard Coupler Co., New York, N.Y.—Sessions-Standard friction draft gear type "K."

U. S. Light & Heating Co., Niagara Falls, N. Y.—The U. S. L. electric lighting equipment for railway cars in operation; electric regulating panels; electric generators; storage batteries of all types; electric starter for gasoline engines.

Westinghouse Air Brake Co., Pittsburgh, Pa.—No apparatus was placed on exhibition this year, having instead the usual space for reception purposes, with representatives on hand for rendering whatever advices or information might be desired in connection with the subject of air brakes.

Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa.—Reception booth with the Westinghouse companies and arc welding exhibit in operation on the pier end.

Birthdays of Transportation Men in July.

Many happy returns of the day to:—

J. H. Black, ex-Superintendent, Timiskaming and Northern Ontario Ry.; now at Cobalt, Ont., born near Smiths Falls, Ont., July 8, 1874.

M. S. Blaiklock, Engineer Maintenance of Way, G.T.R., Montreal, born at Quebec, July 19, 1859.

D. E. Blair, Superintendent of Rolling Stock, Montreal Tramways Co., born at St. Thomas de Montmagny, Que., July 25, 1877.

H. F. Bradley, Passenger Manager, Allan Line Steamship Co., Montreal, born at Waterville, Que., July 20, 1876.

D'Alton C. Coleman, General Superintendent, Alberta Division C.P.R., Calgary, born at Carleton Place, Ont., July 9, 1879.

Geo. Collins, General Manager, Central Ontario Ry., Trenton, Ont., born at Kingston, Ont., July 20, 1860.

G. C. Conn, Vice President, Pere Marquette Rd., Detroit, Mich., born at Woburn, Mass., July 1, 1867.

D. D'E. Cooper, Canadian Freight Agent, Lehigh Valley Rd., Toronto, born at Buffalo, N.Y., July 8, 1862.

John Corbett, ex-General Foreign Freight Agent, C.P.R., Montreal, born in Lanarkshire, Scotland, July 19, 1863.

H. Darling, Locomotive Foreman, G.T. Pacific Ry., Smithers, B.C., born in Northumberland, Eng., July 27, 1873.

S. E. Dewey, Commercial Agent, All Rail Line, G.T.R., New York, born at Beckenham, Kent, Eng., July 4, 1879.

F. C. Foy, Canadian Passenger Agent, New York Central Lines, Toronto, born there, July 5, 1881.

J. B. Gray, ex Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, now lessee of lunch rooms, Angus Shops, C.P.R., Montreal, born July, 1876.

J. H. Hanna, ex-Division Freight Agent, G.T.R., at Hamilton, Ont., now at Calgary, Alta., born at London, Ont., July 27, 1867.

A. D. Huff, ex-Division Freight Agent, G.T.R., Ottawa, now Traffic Manager, Laurentide Co., Montreal, born at Chatham, Ont., July 17, 1866.

C. A. Jaques, ex steamship owner, Montreal, born there July 15, 1849.

C. W. Johnston, Assistant to Passenger Traffic Manager, G.T.R., Montreal, born at Actonvale, Que., July 27, 1879.

A. E. Lock, Car Accountant, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., born at Albany, N.Y., July 14, 1879.

R. G. McNeillie, Assistant General Passenger Agent, Western Lines, C.P.R., Winnipeg, Man., born at Lindsay, Ont., July 1, 1883.

J. M. Macrae, District Freight Agent, Canadian Northern Ry., Saskatoon, Sask., born at Stornoway, Scotland, July 31, 1884.

H. D. Mackenzie, District Master Mechanic, Intercolonial Ry., Stellarton, N.S., born at Churchville, N.S., July 22, 1864.

T. J. Maguire, Accountant Quebec Central Ry., Sherbrooke, Que., born at Quebec, July 31, 1860.

J. E. Morazain, Assistant Superintendent, Montreal Terminals, C.P.R., Montreal, born at Wheatland, Que., July 31, 1875.

R. E. Perry, Assistant General Freight Agent, Canadian Government Railways, Moncton, N.B., born at Drayton, Ont., July 5, 1876.

R. Preston, Assistant Superintendent of Motive Power, Western Lines, C.P.R., Winnipeg, born at Toronto, July 28, 1863.

J. E. Quick, General Baggage Agent, G.T.R. and G.T.P.R., Toronto, born at Richmond, Ontario Co., N.Y., July 10, 1851.

G. G. Ruel, Chief Solicitor, Canadian Northern Ry., Toronto, born at St. John, N.B., July 5, 1866.

P. E. Ryan, Secretary, National Transcontinental Railway Commission, Ottawa, born there July 26, 1876.

Geo. Stephen, General Freight Agent, Canadian Northern Ry., Winnipeg, born at Montreal, July 5, 1870.

R. F. Struthers, Chief Inspector of Time Service, C.P.R. Winnipeg, born at Stratford, Ont., July 31, 1879.

Sir Thos. Tait, President, Fredericton and Grand Lake Ry. and Coal Co., born at Melbourne, Que., July 24, 1864.

H. T. Wilgress, Agent, C.P.R. Pacific Steamship Service, Yokohama, Japan, born at Lachine, Quebec, July 29, 1857.

An Unchartered Railway.—In an action for damages for personal injuries decided in the Supreme Court of British Columbia, at Victoria, May 25, the Canadian Collieries (Dunsmuir) Limited, being defendents, C. F. Compton, Assistant Secretary, stated that the company was not a railway company but a coal company; its trains carried coal from the mines, and also did some passenger carrying. In reply to the judge, Mr. Compton said the original railway was never incorporated, as it was built by a private individual, on his own land. The Wellington Collieries had no railway charter either. In cross examination, Mr. Compton said the line crossed government highways in three or four places. Reports as to the company's operations were made to the Dominion and Provincial Governments, in which it was explained that the railway was operated without a charter; the railway carried passengers, and tickets with the name of Wellington Colliery on this were issued. It was subsequently brought out by another witness, that the Wellington Colliery Ry. was incorporated in 1911, but that it did not own the line on which the accident happened, although that line was a branch of it.

T.H. & B. Hamilton Entrance.—An Ottawa dispatch of June 19 says:—"The Supreme Court decided to-day in a stated case that the Board of Railway Commissioners has not the right to order the Toronto, Hamilton and Buffalo Ry. to locate a new line in the city of Hamilton by way of compelling the use of a common entrance. The Commission ordered the railway to make the change, but its jurisdiction was attacked by the railway, whose contention is upheld."

Trainshed at Windsor St. Station, Montreal, Canadian Pacific Railway.

The new Windsor St. station in Montreal, which the C. P. R. has had in course of construction for the past four years, is now practically completed. Several progress articles on the work have appeared in these columns from time to time, and a description of the terminal yards in connection with the station was published in our Nov., 1913, issue, followed in the December issue by an article on the power interlocking and signalling arrangements, both of which treated the trainshed area in a general way.

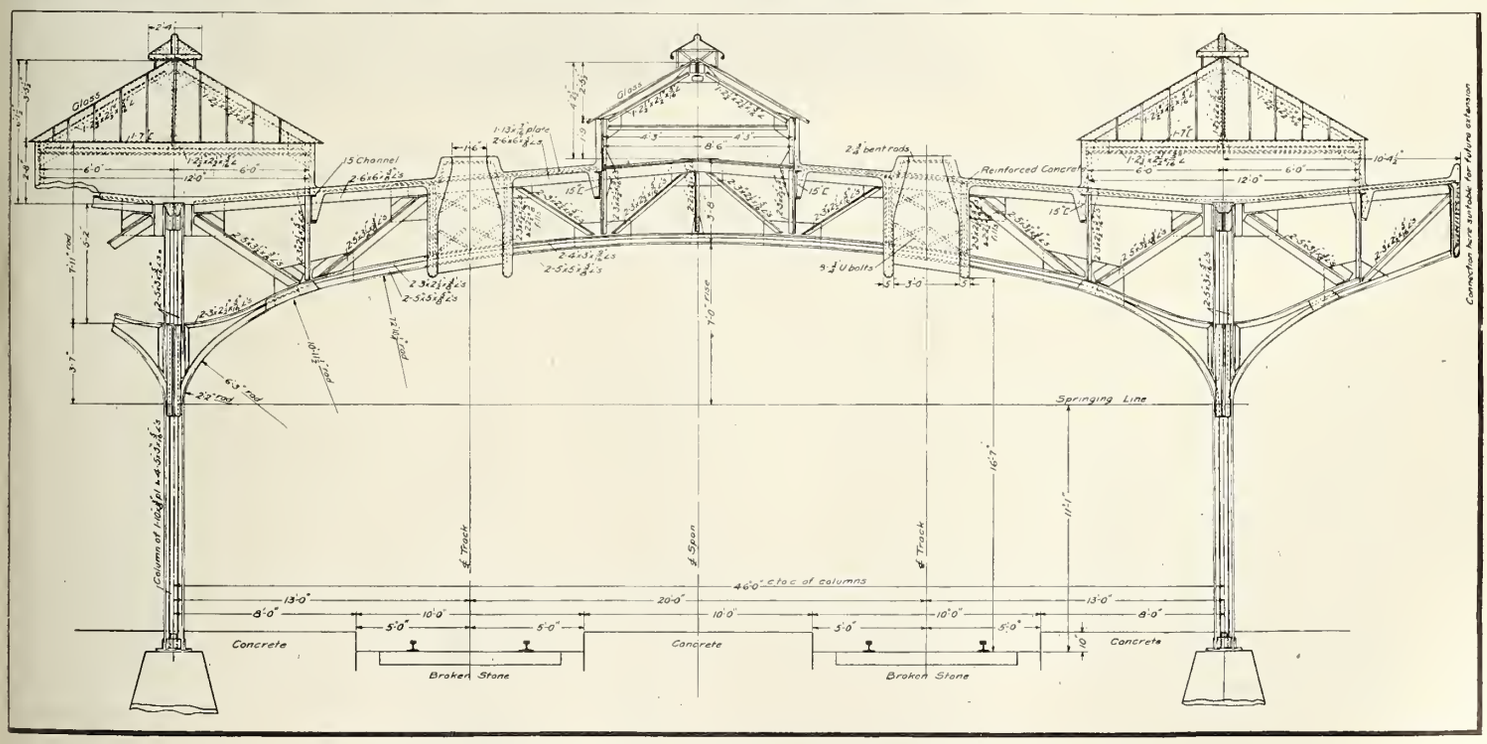
In the remodelling of the station, a difficult problem was presented. The original station on this site was built for the Ontario and Quebec Ry., before its absorption by the C. P. R., about the time the latter completed its transcontinental line. The first station was built along Osborne and Windsor Streets, on the very brow of a comparatively steep hill. The station being small, to meet the then existing traffic, had ample accommodation on the narrow strip between the street and the hill descent, but as the traffic increased, the problem was presented of extending the station in the only possible direction, viz., to the south, on fills made on the side of the slope. Extensions up to the last one, were not very difficult, as the fill required was not very great, but this last addition, extending the trainshed capacity to 11 tracks, required heavy fill work along the downhill side. Under a portion of this extension, there have been built vault and third class waiting room accommodation, but the major portion is on a fill, retained by a concrete embankment wall.

The track arrangement in the station is unusual, all the tracks being entered from a ladder from the west, the ladder leaving the northerly of the tracks, branching off to each of the other tracks, so that the tracks diminish in length from the north to the south, the track capacity varying for train lengths from 5 to 14 cars, the northerly track having a length in the clear of 1,400 ft.

The tracks cutting off in this manner from the ladder, have made necessary a staggered arrangement of trainshed ends. The northerly, or express track, has single arch, supported on the express building wall, and rows of columns between it and the adjoining tracks, which is only 450 ft. long, the greater portion of the track being open. The next four tracks, 2 to 5 inclusive, have trainshed roofs extending 1,003 ft., with the next two, 6 and 7, 807 ft. long, and the next two pairs, 8 and 9, and 10 and 11, cut off at 534 and 450 ft. respectively. This, including cantilever umbrellas over outside platforms, gives a total covered trainshed area of 5 acres, or a train capacity, making due allowance for locomotive length, of about 120 cars.

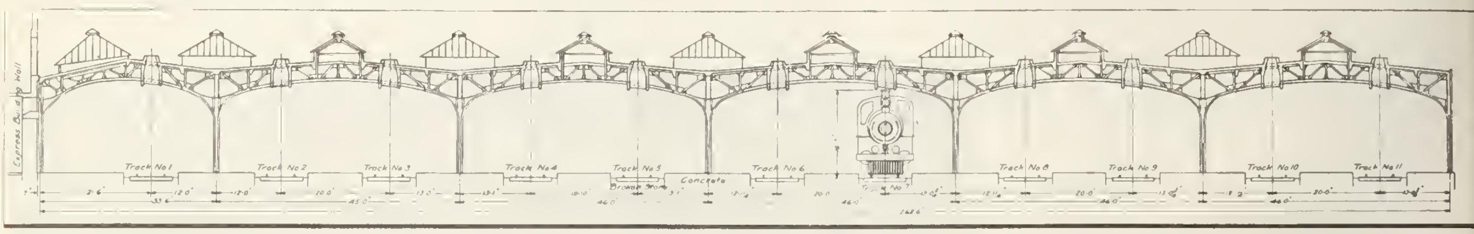
Interior of Trainshed, Windsor Street Station, Montreal, Looking from Station End.

The usual Bush trainshed is somewhat different in the details of design, as a comparison of existing design with the one under consideration will show. An interesting instance of the usual design is that of the G. T. R. central station at Ottawa, which was described in Canadian Railway and Marine World for Nov., 1911. In contradistinction to the former practice of either having a high arched or plain span roof, high above the tracks, to be clear of the injurious effects of the locomotive fumes, or else the umbrella type of overhanging platforms, which are more or less common in stations of small size, the Bush trainshed is a series of short span arches, usually made to span two tracks, and supported on rows of columns, of low construction, a duct



Cross Section of One of the Arches of Trainshed, Windsor St. Station, Montreal.

in the roof directly over the smoke stack taking care of the locomotive exhaust, the blast passing directly to the outside through this duct. This low roof, short span construction is said to make possible the elimination of half the weight of steel usually involved in a large balloon roofed shed, and in



Cross Section of Trainshed, Windsor St. Station Montreal, Looking towards the Station.

addition, has the advantage of being easily extended in either direction from the very nature of its unit construction.

A plan and cross section of the complete trainshed are given herewith, as well as a detailed cross sectional view of one of the arches, which is typical of the lot. To one familiar with the usual Bush shed, this will present some features from which it differs. Usually, the two tracks in each arch are side by side, with the usual clearance between. In this instance, the tracks are separated with an intervening trucking platform, bringing the track centres further apart, and in consequence raising the elevation of the under side of the roof spans. The more general Bush shed practice is to make the roof spans in the form of shaped plate girders, of a somewhat shallower construction than in this instance, which, added to the lesser height due to the tracks being closer together, makes the usual design seem lower set. These two features of the Windsor St. shed design give a more open effect, the roof being considerably higher. In this case, the roof spans are made up of formed lattice girders.

All the spans are 46 ft., with the exception of those over track 1, and tracks 2 and 3, the latter span being 45 ft., slightly less than the normal, while the former is a single track arch, and is 33½ ft. wide over the greater portion of its length, narrowing slightly in the outer three spans. These spans are spaced at approximately 28 ft. centres, the distances varying slightly to meet local difficulties.

The spans are built up of angles principally, of the usual light roof construction,

Plan of Trainshed, Windsor Street Station, Montreal.

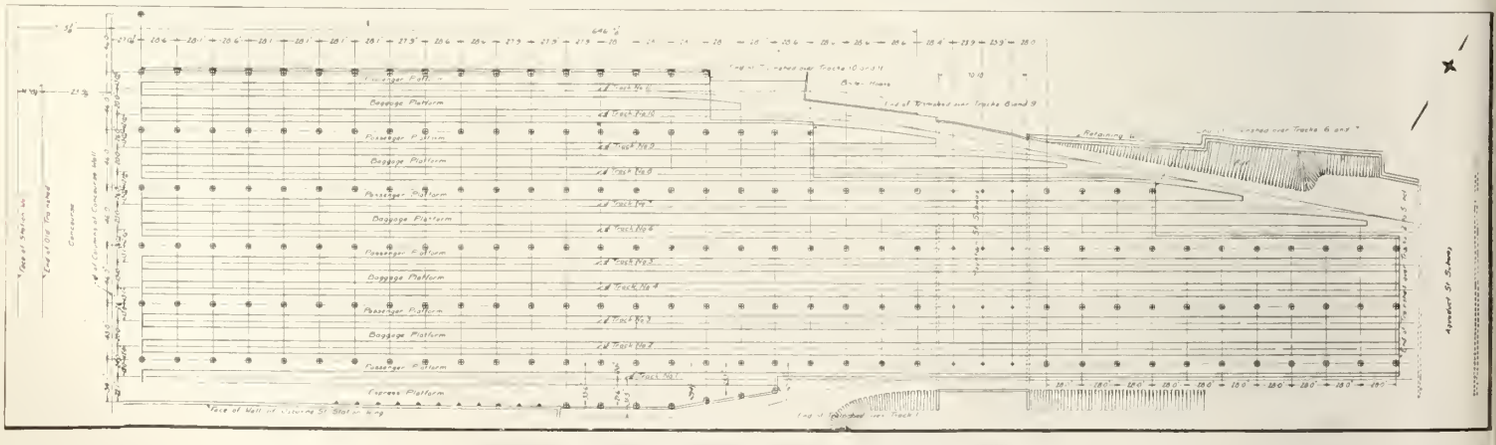
the girder having a depth of 3 ft. 8 ins. at the centre, increasing to 5 ft. 2 ins. over the columns. The upper edge of the truss is straight, sloping from a central height above base of rail of 21¾ ft., to a 19 ft. 10 ins. over the columns. The inner edge of the truss is a seven centred curve, the central portion of which is practically parallel with the upper member of the truss. Between columns, the structure is tied together with a four pannelled truss of similar design, 4 ft. deep, composed of parallel top and bottom members except at the columns, where the lower member is a two centre curve, the curves for these trusses and the cross trusses all rising from the springing line, which is 11 ft. 1 in. above the base of rail.

Down the centre line of the arched trusses, there are peaked roof skylights, 8½ ft. wide, extending the length of the shed. This skylight has 1¾ ft. walls, and is 4 ft. 2½ ins.

Skylights on Trainshed, Windsor St. Station, Montreal.

high at the peak, with a glazed roof, and a monitor running the length of the skylight. Similar but larger peaked roof skylights, 12 ft. wide, and 48 ft. long, extend over every two sections along the rows of columns. These are similarly glazed, and have the same monitor peak elevation as the central skylights.

The smoke duct framings are lattice girders, made up of angles, and are 3¼ ft. deep, one each side of the track centre line. They are completely encased in reinforced concrete, which keeps all the steel work free from the injurious effect of the locomotive exhaust fumes, which in the usual high arch roof have such a disastrous effect on the life of the shed. Where the duct crosses the arch trusses, the latter is also encased in reinforced concrete, which is tied in place by 8 embedded ¾ in. U bolts, the lower edge of this joint being higher than that of the duct sides, and rounded, so that the gases will not escape under the edges of the latter into the shed.

The roof proper is of reinforced concrete, 3 ins. thick. This is carried on the longitudinal column trusses, the duct trusses, and four 15 in. 33 lb. channels, the latter encased in concrete. The reinforcing rods are ¼ in., spaced 2 ft. centres longitudinally, and from 6 to 8 ins. crosswise, and tied together at every second joint. The walls of the skylights are also made of reinforced concrete.

The design of the roof is quite different from the usual Bush type. In the latter, the roof is flatter, with the skylights approximately parallel with the roof surface, and raised about 12 ins. above that surface. In this design the walls of the upper por-

tion of the smoke duct taper inwards to a width of 18 ins., similar to the Canadian Northern Ry's Winnipeg shed, and Central Rd. of New Jersey shed at Jersey City. This arrangement has several advantages. With the flat skylight, heavy snowfalls are more liable to cover the whole roof surface, the skylight becoming covered with snow so as to render the interior lighting poor. With the raised skylights, it is believed that the snow in drifting over the roof will deposit itself in the spaces between the skylights, leaving the latter clear, and free of snow. With the straight side smoke duct, the snow when drifting badly, has a greater tendency to drift down through into the shed interior. By reducing the upper opening of the slot by one-half, this tendency is reduced by the same amount. The snow holding capacity of this roof is considerably greater than with the usual design, but where it is deemed advisable, the surplus snow may be shovelled down from the roof through the slot, into flat cars on the tracks below.

The platform arrangement differs from the usual design, as already mentioned. The tracks under each arch are spaced at 20 ft. centres, with an intervening 10 ft. platform. This latter is used for baggage and express traffic, leaving clear the 16 ft. platform on the other side along the row of columns, clear for passenger traffic exclusively. This has already been found to be a great advantage in handling the traffic expeditiously, and while this arrangement requires a slightly wider span to allow for this extra platform, it is considered worth while. The platforms are of concrete, while the roadbed is of broken stone. In the building of the shed, it was found necessary to slightly lower the latter temporarily to allow for the smoke duct concrete moulds, thereby allowing the work to be carried forward after the erection of the steel work, without interruption to traffic.

A very important advantage in this type of shed is the manner in which it can be erected without interrupting the traffic seriously. From the very nature of its unit construction, it is possible to put up the shed over two tracks at a time, so that only these two tracks need be taken out of service at a time. Instead of requiring a great amount of false work to support the steel while being erected, as in the high arch type, in this scheme the whole span can be completed at the works, shipped to the shed on a flat car, and lifted into place by a wrecking crane. Thus, from an erection viewpoint, the design has marked advantages.

From the maintenance standpoint, it is decidedly better than the high arch type. In the latter, all the gases being exhausted into the shed, the steel, unless constantly painted, is attacked by the acids in the exhaust. Authorities place the life of such a shed at not more than 20 years. In the Bush shed, all the gases are taken outside clear of the shed, so that the interior steel work requires no more than usual attention. In addition, there are no dirty skylights, and the interior illumination is thus kept better, with less work. The accessibility of the skylights in the Bush type, make them easily cleaned when necessity arises, and this also applies to the painting of the steel work. The roof drainage is cared for by copper gutters from the shallow ridges of the roof, at every other column.

The photograph of the trainshed interior shows the artificial lighting arrangement, as supplied by the Northern Electric and Mfg. Co. Centrally in each section of the station, over each platform, there is a 60 watt tungsten lamp, at a height of 15 ft. from the platform to the base of the shade, and suspended 5½ ft. below the supporting beam. All the wiring is run in conduit, and the lighting is controlled from an 80 circuit panel, located in the station master's office.

The design of these trainsheds was developed under the supervision of P. B. Motley, M. Can. Soc. C. E., Bridge Engineer, C. P. R., to whom we are indebted for the data on which this article is based.

Canadian Pacific Railway Construction, Betterments, Etc.

Atlantic Division.—Local press reports state that some negotiations have taken place between the C.P.R. and the Dominion Government, with a view to the purchase of the Windsor branch of the Intercolonial Ry., which extends from Windsor Jct. to Windsor, N.S., 32 miles, and is operated by the Dominion Atlantic Ry., on an agreement under which the Government maintains the line, for a fixed proportion of the receipts.

It was announced after an official inspection of the lines in the vicinity of Fredericton N.B., recently, that $75,000 would be expended on the betterment of the roadbed of the Gibson branch during the year. It is said to be intended to bring the branch up to the standard of the recently completed Fredericton and Grand Lake Ry. and Coal Co.'s line.

Eastern Division.—The Board of Railway Commissioners has authorized the opening for traffic on the second track from Iberville to St. Johns, Que., mileage 19.2 to 20.02.

Application is being made to the Board of Railway Commissioners for permission to build a branch in Longue Pointe from the main line west of Morean St., Hochelaga Ward, Montreal, easterly and northerly through Maisonneuve, and Longue Pointe to Cadastral Lot 396, with a spur in connection therewith. The route of this projected line has been before the courts, in so far as it is located through Maisonneuve, and the matter is likely to go to appeal. The application, mentioned above is for the purpose of setting certain points in order, as required by one of the judgments.

Ontario Division.—It was understood that a regular train service would be put in operation on the newly completed Campbellford, Lake Ontario and Western Ry. June 29.

A Brampton, Ont., press report states that the citizens propose to build a line from there to a connection with the C.P.R. at Islington, and that the C.P.R. will operate a suburban train service over it from Toronto to Brampton, for 60% of the traffic receipts. Confirmation of this is lacking, but Brampton people have been doing their utmost during the last four or five years to get a better C.P.R. connection with Toronto than they have at present, or to get an electric railway.

The bridge over the Nottawasaga River at Baxter, Ont., on the Sudbury line, which collapsed May 15, has been restored, and the train service over it was resumed June 16.

Manitoba Division.—An arrangement has been made between the Winnipeg City Council and the company by which the latter will build a three mile spur to a gravel pit at Springfield, owned by the city.

The Board of Railway Commissioners has authorized the opening for traffic of the Snowflake west branch, just north of the International boundary, mileage 0 to 10.

Alberta Division.—The ratepayers of Medicine Hat, Alberta, have passed a by-law appropriating $70,000 as its proportion of the cost of a subway under the C.P.R. tracks in the centre of the city.

George Bury, Vice President, visited Lethbridge, June 7, on a trip of inspection over the Weyburn-Lethbridge line. He is reported to have said that the line will be completed in 1915. Track is reported to have been laid 60 miles westerly of Shaunavon, at which point divisional terminals are being built. The contract for the buildings is reported to have been let to C. W. Sharp & Son, Winnipeg, at an estimated cost of $50,000.

A contract is also reported to have been let to C. W. Sharp & Son, for the erection of terminal buildings at Empress, on the Swift Current-Bassano extension, at an estimated cost of $50,000.

Track laying is being proceeded with north west of Retlaw, towards the ore country. Local press reports state that a C.P.R. engineering party is in the field locating a line right through to the oil fields.

British Columbia Division.—The tunnel located at mileage 40.4 Boundary Subdivision is on a division of the line now under construction. The diversion will cross a gully at a point where it is possible to replace a wooden trestle by a fill. The tunnel is located on a 2% gradient on a tangent. It will be built according to C.P.R. standards. H. Rindal, Division Engineer, Vancouver, B.C.

The big bridge being built over the Harrison River at Chilliwack, B.C., has a total length of 950 ft. The superstructure is nearly completed, and it is expected it will be ready for traffic by July 31. The bridge over the Pitt River, at Coquitlam, 1,750 ft. long, is expected to be completed in Nov. Both these bridges are to carry double tracks. (June, pg. 261.)

Northern Consolidated Holdings Co.—Application was filed in the Ontario Courts, recently by G. Alexander, Montreal, asking for the winding up of the Northern Consolidated Holdings Co. The applicant asked for the appointment of a liquidator, alleging that the company is insolvent, and demands a full enquiry into its condition and its accounts. He claims to represent $1,000,000 of stock in the company. The N. C. H. Co. was incorporated Dec. 8, 1913, with a capital stock of $8,000,000, of which Mackenzie, Mann & Co., are stated to hold $4,000,000, to acquire and hold the stock of the companies acquired and consolidated as the Canadian Northern Quebec Ry.

Fires near Right of Way.—In reference to the requirement of the Board of Railway Commissioners that railway companies submit monthly reports on fires originating within 300 ft. of the track and burning over an area of 100 sq. ft. or more outside the right of way, particulars of which were given in Canadian Railway and Marine World for June, the Board issued general order 126, dated May 28, that such reports shall be privileged and shall only be made public and given out upon application therefor by order of the Board.

Branch Lines for the Intercolonial Ry.—The Dominion Parliament has voted $500,000 to acquire lines operating in connection with the I.R.C. Any line to be taken over is to be equal in standard to the I.R.C., and the purchase is to be subject to notification by Parliament. It is said that the line which it is desired to deal with at once is the New Brunswick and Prince Edward Island Ry., running from Sackville to Cape Tormentine, N.B., which would give the direct connection between the mainland terminal of the Prince Edward Island car ferry and the I.R.C.

Timiskaming and Northern Ontario Railway Steel Passenger Equipment.

The T. and N.O.R. Commission some months ago ordered 13 passenger cars from the Pullman Co., of all steel construction, sufficient to equip two through passenger trains. The order includes five different types of cars: 3 first class passenger cars, 2 second class passenger cars and 2 combination smoking and second class passenger cars, all 71 ft. long over the end sills; and 3 baggage and mail cars with 30 ft. mail section, and 2 baggage and express cars, both these types 60 ft. long over end sills. All the passenger cars will have seating capacity for 80.

The cars will be lighted by electricity, power being supplied from an axle generator, and will, in addition, be equipped with a generous storage battery system for supplying light when the cars are not in motion. The heating will be by a combination vapor and pressure system of steam heat, automatically controlled to maintain the degree of heat desired, none of the cars having a stove, except the mail cars, each of which will have a small emergency stove. In addition to an efficient arrangement of ventilators, the passenger cars will be equipped with two electric fans each, one fan on each end of the car. The passenger car lavatories and washstands will be supplied with the latest type air pressure water supply.

All the cars will have fish belly centre sills in the underframes, with combined cast steel bolsters and platforms. The superstructure will also be entirely of steel, having an exterior finish of steel plates, well insulated from the interior ceiling of fireproof material. Six-weel trucks will be used, the frames of which are to be cast steel.

The passenger cars will have embodied a new feature in steel car design in the shape of an anti-telescoping device, which, it is claimed, will substantially reinforce the end framing and vestibules, and greatly reduce, if not wholly eliminate, the liability of the cars telescoping in case of wreck. This device consists of two I beams of heavy section, bent into a U shape, with the arms upward, the corresponding arms of the two U's forming the door posts in bulkhead and vestibule. These sections are secured in the steel underframe end casting, and also at the top, so that in the event of a collision, it is claimed that the impact would do no more than cause the vertical arms at the outer end to collapse, and if the impact were sufficiently great, the inner arms might also be bent.

The maximum bending moment in the centre sills for the passenger cars is 4,655,671 in.-lbs.; for the baggage cars, 4,159,816 in.-lbs.; and for the baggage and mail cars, 3,592,180 in.-lbs. The centre sills possess an area of 43.62 sq. ins., and the side sills an area of 11.6 sq. ins., so that there is a total area to resist the direct buffing shocks of 55.22 sq. ins. The moment of inertia of the centre sills is 4,863, and the section modulus for the top flange is 474.93, and for the bottom flange, 301.3. The maximum stress due to the weight of the car and lading will occur in the passenger car, amounting to 15,460 sq. ins.

The baggage and mail, and baggage and express cars, are of similar construction, and of the same size. The underframing is of the fish belly type, consisting of two 5-16. in. centre plates, 37 ft. long, connecting to the steel bolster castings. The central 15 ft. of these centre plates is 2 ft. 2 ins. deep, tapering from that point to a depth of 17 ins., where they connect to the bolster casting. These plates are 18 ins. apart. To the top outer edge of each plate, there is rivetted a 5 by 3½ by ½ in. angle, and at the bottom of each plate outside and inside, 3 by 3 by ⅞ in. angles. A ⅜ in. cover plate, 2½ ft. wide, extends the same length as the centre plates.

The body bolster castings are at 42 ft. centres, and there are two crossbearers, 15 ft. apart, of cast steel, in line with which are separators, also of cast steel. The crossbearers and separators have a cover plate extending across the centre sill members. Over the top of the centre sill and crossbearers, is a 1-16 plate, covering the full area of the car, with pressed stiffeners extending from the centre sill outward at centres averaging about 2 ft. Attached to the outer end of the crossbearers on each side of the car, is a 5 in. 11.6 lb. Z bar, extending the length of the car, to the outwardly projecting flange of which is attached a 4 by 4 by 5-16 in. angle, of the same length, the outer flange of which projects upwards This side sill construction assumes the form of a box under the two side doors of the car, the web of the Z having a 7⅜ by ¼ in. plate, 10 ft. 11 ins. long, attached to its web, with a 3 by 3 by ¼ in. angle, 11 ft. 0½ in. long, rivetted along the top, and two 7 by ¼ in. plates, 6¼ ft. long, attached to the upturned flange of the side sill angle, the whole superimposed with a steel threshold casting

The two door openings are each 5 ft. 9⅛ ins. wide, and 24 ft. 2⅞ ins. apart from inner edge to inner edge. Extending the length of the car, except for the door openings, which are reinforced as mentioned, there is a side sill plate, 2 ft. 9⅞ ins. deep, of 3-16 in. plate, reinforced along the top edge by a 4 by 1⅜ by 7-16 in. angle. This plate, angles, and Z bar, and box construction under the door openings, form the side sill construction of the car.

The side posts are of flanged 3-16 in. plate, at about 2 ft. centres, and are diagonally braced at both ends, and at the both sides of the door openings. There are four window openings along each side, 2¼ ft. by 3 ft. 8 7-16 ins., between the side posts, which are slightly farther apart at these points. The side framing of the car is 7 ft. 5 13-16 ins. deep.

The side posts are attached to a 4 in. Z bar along the top edge, which, with a letter board, 11⅛ by ⅛ in., reinforced along the bottom edge by a 2¾ by ⅛ in. stiffener, forms the top side framing girder.

The side roof, of 0.063 in. plate, is carried on 2 by 2 by 3-16 in. carlines, at 3 ft. centres, bent to a 3 ft. 5⅝ in. radius. A 2 by 2 by ¼ in. angle forms the lower edge of a deck panel, which is 15 ins. deep, of ⅛ in. plate. The upper edge, forming the deck chord, is of ⅛ in. plate, bent to an angle. Between these deck chords, arch the deck carlines, which are pressed from ⅛ in. plate to a radius of 18 ft. 1 in. The roofing is 0.078 in. plate.

The construction of the passenger cars is almost identical with that of the baggage and mail, and baggage and express cars. The length over bumpers is increased to 71 ft., which gives an increased length to the underframing in proportion. Instead of two crossbearers, there are three, one central, and the other two, each 12¾ ft., each side of centre. The central 25½ ft. is straight, the ends tapering to the bolster castings. The truck centres are 55 ft. Apart from this change in length, the whole of the car framing is the same, from centre sill through side sills right up to the decking. The side framing above the side sills construction differs, in that there are a series of windows the length of the car, with main posts between at 6 ft. centres, between which are small posts. The main posts are 12¼ ins. wide, and the intermediate ones, 2½ ins. wide. Apart from these changes, the construction of the cars is identical with the baggage, express and mail cars described above.

The cars have all been delivered.

Dominion Government Railway to Hudson Bay.

In a recent interview, N. K. Boyd, one of the contractors, is reported to have said in Winnipeg that it is expected soon to have 3,000 men on the work, of which over 2,000 will be engaged on grading and the remainder on bridge work, tracklaying and ballasting. The plant on the work consists of 3 steam shovels at Pas, and 2 at mileage 110; 13 locomotives; 100 Hart convertible cars, and numerous box and flat cars, in addition to two passenger cars which are being operated as far as mileage 110. It is expected to have track laid to the Manitou rapids of Nelson River, and to have the grading completed from the Manitou Falls to within 110 miles of Port Nelson by the end of the year. A large bridge is to be built at Manitou Rapids, and the foundation work will be done this year.

The work of laying out the terminals at Pas and at Port Nelson is being proceeded with. Two tracks have been laid at Pas, one from the roundhouse at Eighth St., and another from the Canadian Northern Ry., connecting with the bridge across the Saskatchewan River. It is reported that eight tracks are to be laid in the yards at once, in such a manner that six additional tracks may be added as required. We are officially advised that while track laying in the yards has been started, the complete details of the layout have not been worked out, and that it is expected to lay between six and eight miles of track in the yards during the summer. The work in progress at Port Nelson is of a more preliminary character. (June, pg. 264.)

Small Claims Against Government Railways.—The Dominion Parliament has repealed sections 3 and 4 of the Government Railway Small Claims Act, 1910, and replaced them by sections which provide that process shall not be issued in any suit against the Crown, but against the General Manager of Government Railways, and shall be served on him, or any person only authorized by him to accept such service. The General Manager shall be entitled by such description to appear, plead and defend, subject to the same rules of practice and procedure as any private person. The General Manager shall be entitled to set up and prosecute any setoff or counterclaim. If judgment is given in his favor, he may proceed to execution. In no case shall the General Manager be personally liable in respect of any proceedings under the act. The words "General Manager of Government Railways" are substituted for "Government Railways Managing Board," in sections 5, 6 and 8 of the act. A new section declares the General Manager to be the successor of the Managing Board, and as such to be entitled to receive the benefit of any actions already decided, and to carry on any actions now standing in the name of the Managing Board.

That the electrically controlled brake will be the means of solving many of the braking problems that are now being encountered, was the opinion expressed by H. H. Vaughan, Assistant to Vice President, C. P. R., at the annual convention of the Air Brake Association recently.

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The Postmaster General's Attempt to Establish an Autocracy.

Canadian Railway and Marine World is not a political paper and has no partisan bias. Its founder, who still controls it, is a Conservative. In forty years of voting life he has never voted for anyone but a Conservative candidate, at either Dominion or Provincial elections. In years gone by, he took a somewhat active part in political affairs, but on establishing this paper decided to withdraw from participation in them, without, however, in any way changing his personal views, believing that Canadian Railway and Marine World would thereby occupy a stronger position among its readers, embracing men of both political parties throughout the entire Dominion. For this reason political questions have found no place in its columns, but circumstances have arisen which make it necessary to depart from that policy, in one instance at least, and to protest against recent action by the Postmaster General.

On other pages of this issue considerable space is devoted to a bill introduced at the Dominion Parliament's recent session, by the P.M.G., in which a most barefaced attempt was made to give the occupant of that position even more autocratic powers than he already possessed, and to take from a large section of the people rights which should be inalienable. The portion of the bill particularly dealt with elsewhere in this issue is that relating to compensation to be paid electric railways for carrying postmen, the P.M.G. having made an ineffectual attempt to secure the power to fix this arbitrarily, without the companies affected being given the right to secure arbitration or to appeal in any way. This provision was included in an "omnibus bill," entitled "An Act to Amend the Post Office Act," in which a number of other matters were dealt with, including newspaper postage rates, registration and insurance of letters, appointments and salaries of railway mail clerks, etc., etc.

We say deliberately, and without fear of successful contradiction, that a determined attempt was made to smuggle this bill through Parliament, without at least two of the interests affected, viz., newspaper publishers and electric railway companies, being aware of its contents. It was not distributed to the press in the usual way, nor even to those who subscribe for copies of all bills in order to keep posted. In fact, as far as Canadian Railway and Marine World is concerned, a copy of it was not received until after it had been read a third time in the Commons, and then it came simultaneously with the Official Report of the Debates which contained the discussion on the third reading. That the attempt to keep the contents of the bill from those interested was deliberate, is proved by the fact that a person who wrote a permanent official of the P.O. Department on May 6, asking for a copy of the bill (two days after it had been read a third time), received an answer from that official, dated May 8, stating that the bill would not be printed until it had been signed by the Governor General. This was an absolute untruth, as Canadian Railway and Marine World had a day or two previous to the date of that letter secured a copy of the bill, and we cannot believe that the untruth was unintentional. We cannot imagine that a permanent official, occupying such a prominent position as the one referred to does, was unaware that it was necessary that the bill should be printed before it could be passed in the Commons. When he gave the answer above stated, the bill had not only been printed for submission to the Commons, but it had been reprinted as passed by the Commons, and for submission to the Senate. When the discussion on it opened in the Commons the P.M.G. gave an evasive answer as to the effect of some of the amendments proposed, and anyone reading the official report of his remarks cannot fail to come to the conclusion that there was a deliberate attempt to deceive.

The including of the various subjects above referred to in one bill, is in keeping with the cunning which appears to be one of the P.M.G.'s chief characteristics. By putting in the clause respecting newspaper postage rates, and compensation for carrying postmen on electric railways, with other clauses relating to appointments and salaries of railway mail clerks, he attempted to bring it under the head of a money bill, and therefore unamendable by the Senate, but he was unsuccessful.

We do not believe that Mr. Borden had any knowledge of the contents of the bill, before they were brought to his attention after it had passed the Commons. In the multiplicity of his duties he is not blamable for this. We believe he is too high principled to have countenanced such legislation, and we cannot help thinking that when he was informed of what had been done he deeply regretted it.

As pointed out elsewhere in this issue, the electric railway companies had no notice of the portion of the bill affecting them, and no opportunity for making any representation to the Commons. The intention evidently was to "railroad" the bill through the Senate in the same way, but its reference to the Committee on Banking and Commerce, in opposition to the expressed wish of the Government leader in the Senate, prevented this, and an amendment was secured giving electric railway companies the protection which they offered last year to accept, but which the P.M.G. refused, viz., reference to the Board of Railway Commissioners.

The rate of postage to be paid by newspaper publishers for the transportation of their papers has, ever since Confederation, been vested in Parliament. The objection to the P.M.G.'s attempt to take that power from Parliament, and confer it upon himself, is not a question of rates. The publishers object to it because they want stability, and because they do not want to be in the power of any one man, who could change rates as often as he might see fit, and who would have absolute powers of discrimination. Many of them particularly object to such powers being vested in the present P.M.G., who has shown himself impervious to argument or reason, and they object to his successors, whoever they may be, having such power, but they do not object to paying a reasonable rate, to be settled by Parliament. The question of newspaper postage rates has been before the P.M.G. for months. He had ample time to prepare a tariff and present it to Parliament, but he broke faith with the Canadian Press Association, and attempted to steal a power which no one man should possess.

This is not a political question. As soon as the contents of the bill leaked out, protests from newspaper publishers all over Canada, irrespective of their politics, poured into Ottawa, but Mr. Pelletier treated them with absolute contempt. When the bill first came up in the Senate, Sir Mackenzie Bowell, an ex-Conservative premier and the ex-government leader in the Senate, said: "Although I appear as a seconder, I do not approve of the bill and I am not to be com-

mitted to it." The representations of the Canadian Press Association were presented by the chairman of its postal committee, P. D. Ross, who is a close personal friend of Mr Borden, and is the proprietor of the Ottawa Journal, which is generally recognized as the Government organ at the Capital. The Managing Director of Canadian Railway and Marine World, Conservative though he is joined hands with the other opponents of the bill, and did everything possible to ensure its defeat, which was finally accomplished.

The P.M.G. is trying to make political capital out of the action of the majority in the Senate. They simply granted the request of the Canadian Press Association, which was worded as follows: "Resolved, that the executive of the Canadian Press Association hereby respectfully appeals to the Senate to strike out of bill 147 the clause empowering arbitrary changes of newspaper postage."

During the discussions on the bill, and after its defeat, the P.M.G. made several open threats against publisners and others who opposed it, and there is no doubt that if he remains in the cabinet he will have to be reckoned with again in connection with this subject. The Premier is now conversant with the facts. Believing as we do in his high mindedness and absolute probity, we cannot think that he can approve of such arbitrary methods, and we look to him to restrain his colleague. If this is impossible, it would be advisable to transfer the P.M.G. to some other position, preferably outside the cabinet, where his opportunities for the perpetuation of glaring injustice would be at least minimized

In connection with some of the objectionable provisions and matters of post office department administration, such as the refusal to allow papers to publish two page advertisements, a refusal entirely contrary to the post office regulations as then existing, some of the permanent officials of the department have taken a very prominent part. They would do well to accept a word of warning, and to remember that they are the servants of the people, not its masters. Neglect to realize this, and a continuance of their recent activity, would provoke a public demand which could only be satisfied by drastic changes in the manning of the department.

During the discussion of the P.M.G.'s bill before the Senate committee, a waggish Senator wrote and passed around among his colleagues the following "cablegram":

"St. Petersburg, June 2, 1914.

"To Pelletier, Ottawa.

"How dare you copy my legislation without permission?

"Nicholas, Czar."

Pacific Coast Collieries.—An issue of $500,000 of 6% first mortgage and collateral trust 30 year sinking fund gold bonds, is being made by the Company. The issue price is 98 and the bonds carry a bonus of 35% of common stock. The company owns collieries, railways, wharfage and other shipping facilities at South Wellington, Suquash, Boat Harbor, Malcolm Island and Oyster Bay, on Vancouver Island, B. C. The present output is 2,500 tons a day, which will slowly be raised to 4,000 tons by the addition of new equipment, and the opening of a new property. The company sends its output over its own railway, selling f.o.b. at its own harbor. The directors are:—Jas. Carruthers, President; R. Bickerdike, Vice President; Sir Thomas Tait, C. P. Hill, Montreal; Hon. P. Ellison, M. P. P.; R. T. Elliott, Victoria, B. C.; A. H. S. McGowan, M. P. P., Vancouver, B. C.; E. Bristol, K.C., M.P., Toronto.

Canadian Northern Railway Construction, Betterments, Etc.

Sir Donald Mann, Vice President, in an interview, June 13, is reported to have said that now the bond guarantee has been sanctioned by the Dominion Parliament, it is expected that all the money required for the completion of the company's undertaking will be raised. Financial conditions, however, change from day to day, but according to present indications the money will be obtained. In the meantime the company will go ahead with all the construction in hand all over the system, and will proceed with such betterments and improvements as are necessary. Some of this work has been held back pending the conclusion of the financial arrangements, but it will now all be proceeded with. It is expected that all the sections of the transcontinental line will be connected within a year, ready for operation. Traffic will be started on the Toronto-Ottawa line very shortly; and the Montreal-Ottawa-Port Arthur line will be pushed forward vigorously. About 300 miles of the main line in the prairie provinces will be relaid with heavier rails, and the remaining mileage will be relaid in 1915. The whole of the line will then have been laid with these heavy rails tieing in with the new construction now going on. The rails released will be used on branch lines.

It was reported, June 13, that an order had been placed with the Dominion Steel Co. for 45,000 tons of steel rails.

Mount Royal Tunnel and Terminal Co.—The "break up" stage of construction on the main part of the Mount Royal tunnel was completed May 31, and the excavation of the tunnel on the remaining section under the city streets and on about 700 ft. at the western portal is in progress. The excavation at the station site is being progressed with, a depth of over 20 ft. having been reached. The site will have to be excavated to a depth of 35 ft. A plant has been erected in the Model City for manufacturing concrete blocks to be used for the lining of the tunnel, a work which it is expected to start at an early date. Sir William Mackenzie, D. B. Hanna, H. K. Wicksteed, and L. C. Fritch, paid a visit of inspection to the tunnel works, June 12.

Canadian Northern Ontario Ry.—It was announced that a regular through passenger train service would be put in operation between Toronto and Ottawa, June 29, replacing the previous services.

A passenger train service was put in operation on the spur line, completed four years ago, from Udney, on the Toronto-Sudbury line, into Orillia, June 13. The line is about 10 miles long. Press reports state it is intended to build an extension of this line from Orillia, round the west side of Lake Couchiching, rejoining the Toronto-Sudbury line at Hamlet, thereby enabling the company's trains to run through Orillia.

Canadian Northern Ry.—While no official announcement has been made as to the season's work, it is said that all the construction work in hand will be pushed forward to completion. Arrangements are being made, it is said, to accelerate all the construction work on the branch lines, and to push forward ballasting and other finishing up work on the lines on which track was laid last year. The transcontinental line work to the Albreda Summit is being pushed. The details of the betterment works to be done on the various lines west of Port Arthur, Ont., are being settled.

Application is being made to the Board of Railway Commissioners for authority to build a spur line from between Harold and Vickers streets, Fort William, northerly, for industrial purposes.

Representatives of the Yorkton, Sask., Board of Trade, reported, recently, that they had been assured by the company's officials at Winnipeg, that the laying of steel on the branch through Yorkton to Willowbrook will be completed at as early a date as possible, and that Yorkton will be made a divisional point.

The Mayor of Medicine Hat, Alberta, is reported to have received a telegram from Sir William Mackenzie to the effect that grading will be started on the line from Hanna, on the Saskatoon-Calgary line, into Medicine Hat, Alta., about 100 miles, in July. The line from Saskatoon and the line from Vegreville effect a junction at Drumheller, from which place there is a single line into Calgary.

It is reported that as soon as ballasting is completed on the Vegreville-Calgary line a daily train service will be put in operation.

The Treasurer of Alberta reports tnat he has received the balance of the $6,500,000 received for the honds of the C.N. Western Ry. This is to be used for branch lines under construction, or to be constructed in the Province. Details of the several lines and of the work done on each were given in our June issue.

Canadian Northern Pacific Ry.—The Premier of British Columbia is reported to have said in a recent speech that this line is being built to a higher standard than called for in the specifications. When the construction of the line was under consideration three routes were looked into, one over the Hope Mountains, one from Howe Sound, and the present one. The latter was selected as offering the best gradients, and furnishing transportation facilities where most required. The fact that the C.P.R. is proceeding with its important second track work, and gradient reduction work, shows the importance of this route. The construction of the important bridge at Cisco was expected to be completed by July 31, after which track laying could be proceeded with along the Thompson River. This bridge is 910 ft. long, and is about the biggest one on the line.

S. K. Sykes, of the company's engineering staff, completed an inspection of the line to the Albreda Summit, June 12. The principal grading yet to be done is along the North Thompson River, where about 80% has been completed. The bridge building is being delayed by scarcity of labor.

Vancouver Island.—It is reported that grading on the Alberni line has been completed to mileage 135. Two routes are under construction from mileage 135 to 140, and grading will be gone on with as soon as it has been decided which route will be adopted. The substructures for the bridges are being put in, and the steel work is being assembled. It is expected that tracklaying will be started on an early day. (June, pg. 272.)

Telephone Dispatching on Intercolonial Ry.—The Dominion Parliament has voted $64,000 for the installation of telephones in connection with train dispatching on the Intercolonial Ry. The acting Minister of Railways stated that the amount was sufficient to cover the system between St. John, N.B., and Truro, N.S. The contract has been awarded to the Hall Switch and Signal Co., for the installation between Moncton and St. John, N.B., and tenders are under consideration for the extension from Moncton to Truro.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—J. D. McArthur, the general contractor for this line, is reported to have stated in Edmonton, Alberta, June 11, that grading had been sufficiently advanced to permit of tracklaying being gone on with. (June, pg. 266.)

Alberta Pacific Ry.—See Western Dominion Ry.

Algonquin Ry.—The Dominion Parliament has incorporated a company with this title to build a railway from the C.P.R., west of Blairmore, Alberta, northerly and westerly through townships 8 and 9, range 4, west of the 5th meridian, to the centre of sec. 20 in tp. 19, about 15 miles. The company's offices are in Vancouver, B.C. and its provisional directors are:—G. H. Salmon, C. A. Hancock, R. P. Stockton, R. Smith, J. A. Harvey.

The Atlin Ry. Co. has been incorporated by the Dominion Parliament to build a railway from the southern end of Atlin Lake, B.C., in a generally southerly direction to the Taku River, where it crosses the International Boundary between British Columbia and Alaska. United States press reports state that preliminary surveys are being made by a party in charge of F. J. Wetrick, who, it is stated, has just completed a preliminary survey for a railway from Taku Inlet, Alaska, along the Taku River Valley to the Alaska-B.C. boundary. Plans of this survey, which has been made under the charter of the Taku Ry. and Navigation Co., have been filed at Juneau, Alaska. (April, pg. 165.)

Burrard Inlet Tunnel and Bridge Co.—We are officially advised that the company has not yet decided upon a design for the projected bridge across the Second Narrows of Burrard Inlet. The position in regard to this matter now is, that the cost of the construction of the bridge on the plans prepared by Sir J. W. Barry, London, Eng., and approved by the Dominion Government, was in excess of the money at the command of the company, and the Barry engineering contract has been cancelled by mutual agreement. Certain alternative and cheaper plans were submitted by bridge builders, and these are under consideration. Local labor and other interests are urging that the steel for the superstructure be fabricated in local shops, and the directors are investigating to see how far this could be done. (June, pg. 266.)

Calgary and Fernie Ry.—We are officially advised that the officers for the current year are:—President, J. S. Hough, K.C., Winnipeg; Vice President and General Manager, F. Crandell, Calgary; Secretary Treasurer, W. J. Ball; Chief Engineer, H. B. Ferguson, and that it is the intention to begin construction during this year of the whole line from Fernie, B.C., to Calgary, Alta., 150 miles. The whole route plans have not yet been finally approved by the Minister of Railways, nor the location plans by the Board of Railway Commissioners.

The Minister of Railways has approved of the route map from Fernie to 18 miles from Calgary. The route for this 18 miles paralleled that laid out by the Western Dominion Ry., and the Minister has approved of that company's route, provided that running rights be given over it to the C. and F. Ry. If the W.D. Ry. does not begin its own line within three months, and complete it within a reasonable time, the C. and F. Ry. may build on its own survey into Calgary.

The Grain Belt Construction and Development Co., Calgary, Alta., of which F. Crandell is Manager, is interested in the construction of the C. and F. Ry., the High River and Hudson Bay Ry., and the High River, Saskatchewan and Hudson Bay Ry. This company has a capital of $165,000, and is being financed largely in England. (June, pg. 266.)

Edmonton, Dunvegan and British Columbia Ry.—The Board of Railway Commissioners has approved of location plans for the line through townships 77 and 78, ranges 19 to 23, and through townships 74-77, ranges 18 and 19, west of the 5th meridian, Alberta. (May, pg. 213.)

Esquimalt and Nanaimo Ry.—It was expected to have track laid to Courtenay, B.C., on the extension from McBride Jct., by June 30. The last report of the progress of the work prior to that date was that the superstructure on the Trent River bridge was being put in place by the Dominion Bridge Co. The ballasting gang is working close behind the tracklayers, and as the buildings in Courtenay are completed it is expected to have a train service in operation early in July. (June, pg. 266.)

Glengarry and Stormont Railway.—So far it has been impossible to obtain any official information about this company's proceedings. Its office is at 43 St. Francois Xavier Street, Montreal, in the offices of G. W. Farrell & Co., stockbrokers, etc., who were also interested in the financing of the Lake Erie and Northern Ry. It is believed that they are acting in connection with the C.P.R., and that that company will take over and operate the line when completed. A contract for the construction of the line is said to have been given to the Glengarry Construction Co., 400 St. James St., Montreal, and subcontracts are also reported to have been let, and it is said that construction is in active progress. As previously stated the line is to run from St. Polycarpe, on the C.P.R. Montreal-Toronto line to Cornwall, Ont. (May, pg. 213.)

Ha Ha Bay Ry.—We have been officially advised that during 1913 about four miles of the branch to Laterriere, Que., and the mile of the branch to the wharf at Bagotville, Que., were completed. Some work was done in 1912, but the lines were finally completed in 1913. (June, pg. 266.)

High River and Hudson Bay Ry.—We are officially advised that the officers for the current year are:—President, R. J. Wallace, Vice President and General Manager, F. Crandell; Secretary-Treasurer, H. N. Shappard; Chief Engineer, H. B. Ferguson. The second and last of these hold similar offices in the Calgary and Fernie Ry. Route plans for this railway are before the Minister of Railways for approval, and location plans for about 100 miles of line east and west of High River, Alta., are completed. (Mar., pg. 121.)

High River, Saskatchewan and Hudson Bay Ry.—We are officially advised that route plans have been prepared for this projected railway, and will be submitted for the approval of the Minister of Railways at once. (Mar., pg. 121.)

Intercolonial Coal Mining Co.—The Nova Scotia Legislature has authorized the affixing of the provincial guarantee to the principal of a loan not exceeding $100,000 to aid the company in developing the coal mining properties formerly owned by the Acadia Coal Mining Co., and situated near New Glasgow. In connection with the mines several lines, aggregating 14 miles in length, connecting them with New Glasgow and other points, were built. Sir H. Montague Allen was President of the Acadia Coal Co., and C. Fergie is President of the I.C.M. Co. (See Acadia Coal Co., Sept., 1910, pg 725.)

Intercolonial Ry.—Work is reported to be well advanced on the spur line at Pugwash Harbor, and it is expected that it will be opened for traffic by July 30.

The following sums have been voted by Parliament:—Diversion of line and branch to wharf, Chatham, N.B., $10,000, capital account; second track work, Chaudiere Jct. to St. Romuald, Que., $160,000; diversion of line between Nelson and Derby Jct., N.B., $108,000; increased accommodation at Fredericton, N.B., $10,000, representing the unexpended portion of a vote of last session; general protection of highways, $66,000; subway and facilities at Hampton, N.B., $40,000; elimination of level crossings, $100,000; increasing accommodation along the line generally, $200,000.

Details of the work in progress on the Chatham and Nelson divisions, and on the Chaudiere Jct. second track work, have already been given in previous issues, the present votes being to carry on and complete the work. In respect of the general protection of highways it was explained that the work on the list for this year is estimated to cost $153,000. (June, pg. 266.)

Kettle Valley Lines.—The revised route map of the last section of the K.V. Lines in British Columbia to be put under contract, which has been approved by the Minister of Railways, shows a line starting at mile 60, on the original approved route, and tieing in again with it at mile 110, Otter Creek Summit. The new route reaches Princeton at mile 70, and joins the Vancouver, Victoria and Eastern Ry. about three miles further on, and passing through Coalmount, Tulameen, and along Tulameen Lake and Otter Creek to the Summit. The V.V. and E. Ry. is practically completed to Tulameen. The original route on the section, which starts at Siwash Creek, followed the Five Mile Creek to milage 60, where the new route deviates, then crossed to the Summers Creek Valley, which was followed to and along Pastazoula Lake, thence worked over to near Aspen Grove, and along one of the forks of Otter Creek to the Summit. The section is being built by Galbraith & Co., and from Princeton to the Summit will be operated as a joint section with the V.V. and E. Ry. It is understood that at a future date, when the development of the country warrants, the line will be built over the original route. (June, pg. 266.)

Labrador, Quebec and Southern Ry.—The House of Commons declined to concur in the Senate amendment that this company's line was one "for the general advantage of Canada," on the ground that it might be construed to contain a tacit admission that there was a boundary between the Canadian and the Newfoundland Labrador. The particular territory in dispute forms the subject of a reference to the Imperial Privy Council, to be argued during the summer. The effect of this decision was that the bill was killed. (June, pg. 266.)

Lake Erie and Northern Ry.—The work of finishing up the line between Brantford and Galt, Ont., is nearly completed, and it is expected to have a regular train service in operation very soon. In Brantford work was started June 8, on the retaining wall at the Lorne Bridge, which was expected to be raised to the new level by June 30. No construction is in progress on the line between Brantford and Waterford, and local reports state that it is likely the company will run its trains over the Toronto, Hamilton and Buffalo Ry. between these two points. Beyond Waterford and

Port Dover work has been restarted, and considerable progress is being made. A number of C.P.R. engineers, who were engaged on the second track work between Islington and Guelph Jct., were ordered to report on the work, and a C.P.R. bridge construction gang was sent to Simcoe.

It was stated in Brantford, June 17, that any intention of utilizing the T.H. and B.R. station in the city, and the T.H. and B.R. line between Brantford and Waterford, had been abandoned. The L.E. and N. Ry. will, it is stated, build its own station in the city, and its own line to Waterford.

Montreal Central Terminal Co.—An issue of £1,028,000 of 5% first mortgage bonds was offered on the London, Eng., market, June 4, at 90. The prospectus states that they are to be secured on a first mortgage on the company's central station proposed to be built on Ontario St., Montreal, with yards, warehouses, etc., in connection therewith, and the railway lines to be built between the central station and the points of junction near Bordeaux, Montreal, with railways entering Montreal from the north and west. It is asserted that the proposed system of the company's railways will, when completed, be connected with at least 12 railway lines, and will exchange traffic therewith. The directors are:—C. Newhouse Armstrong, London, Vice President; Central Ry. of Canada, President; J. E. Wilder, manufacturer, Montreal; Hon. T. Berthiaume, M.L.C., Proprietor, La Presse, Montreal; Sir Thomas H. C. Troubridge, London; A. E. Labelle, Harbor Commissioner, Montreal; F. H. Allen, New York and F. E. Came, M. Can. Soc. C.E., Montreal; Sir Douglas Fox and Partners, London, are consulting engineers, and the City Safe Deposit and Agency Co., Ltd., London, are trustees for the bondholders.

The prospectus also states that several railways have at present only a restricted access to the centre of the city, and that there is no effectual means of traffic exchange between the several lines, and that additional traffic connection with the south of the city is required. It is expected, adds the prospectus, that the yards will be sufficiently advanced to permit of their use by July, 1915, and fully completed in Dec., 1915, from which it is estimated that there will be, after providing for bond interest, a surplus of $347,935 from railway revenue alone. When the proposed tunnel to the south shore is completed, the revenues would be largely increased.

Pacific, Peace River and Athabasca Ry.—D. A. Thomas, President, Cambrian Collieries Trust Co., who is also President of the P.P.R. and A. Ry. Co., returned to London, Eng., recently from a trip to Western Canada, and is reported to have stated that adequate financial arrangements had been made for starting construction on the railway, and also for the electric lines proposed to be built under the charter of the Peace River Tramway and Navigation Co. It was not expected, however, to go on with construction on the latter lines this year.

The surveys for the Nasoga-Groundhog section of the line show a route of about 150 miles. Local press reports state that negotiations have been in progress with Sir Donald Mann with a view to the line built from Stewart, B. C., inland for 14 miles, and surveyed to the Groundhog district, under the charter of the Canadian Northern Eastern Ry. being utilized as part of the company's line. This line would be 105 miles in length to the Groundhog district, and is not at present being operated. (June, pg. 267.)

Pacific Great Eastern Ry.—Grading has been completed on the extension from Dunsarave to Horseshoe Bay, B.C., and the steel bridge work is in progress. It is expected to have a train service in operation from North Vancouver to Horseshoe Bay by the end of July. Work is in progress between Horseshoe Bay and Squamish, the ocean terminal. On the terminal site a large quantity of filling is being done along the foreshore. From Squamish the line is under construction practically through to the junction with the G.T. Pacific Ry. at Fort George. We are officially advised that contracts have been let for construction on this line north of Clinton, B.C., as follows:—Madden Bros., Clinton, 6 miles; Rankin and Kellett, Clinton, the next 20 miles; Welch and Kennedy, Clinton, the next 4 miles. The remaining mileage is expected to be put under contract in August.

The projected extension from Fort George to a junction at B.C.-Alberta boundary with the Edmonton, Dunvegan and British Columbia Ry. is under survey. (June, pg. 267.)

Pere Marquette Rd.—The company has under construction at Blenheim, Ont., a 100-ton coal chute, of reinforced concrete, with elevators. The floor level is 23 2-3 ft. below the rail level, and the coal will be elevated by hoppers 75 ft. to a chute, from which it will be dropped into the tenders. It is expected the plant will be completed by July 31. (July, 1913, pg. 332.)

Quebec and Saguenay Ry.—The Premier recently stated in the House of Commons that the Government was not aware that the Canadian Northern Ry. was going to buy the Q. and S. Ry., or that there was any arrangement for its purchase of the line if the C.N.R. guarantee was finally passed. The Q. and S. Ry. is a partially constructed line, upon which construction has ceased owing to financial difficulties. (June, 1913, pg. 278.)

Reid Newfoundland Ry.—A loan of $2,000,000 has recently been placed in London, Eng., by the Colonial Government to complete the construction of the branch lines arranged for five years ago. The agreement provided for the building of six branches, aggregating about 400 miles. The Bonavista Bay branch, 90 miles, was completed in 1911; the Trepassey branch, 104 miles, is expected to be completed early this summer; the Carbonear-Grale's Cove branch, 45 miles, is completed. Considerable work has been done on the other branches, which will serve the Heart's Content and Fortune Bay districts, and it is expected to have them ready for the completion of tracklaying this season. (May, pg. 215.)

St. John and Quebec Ry.—The Dominion Parliament, at its recent session, provided for the guarantee of bonds for $3,000,000 for building three bridges on the line, at Andover, at The Mistake on the St. John River, and over Kennebecasis River at Parry Point, N.B. It was stated in explanation that a certain amount was provided in 1912 for the erection of these bridges, but it had since been found that they could not be built for the money. As the line, when completed, is to be operated as a part of the Intercolonial Ry., the Government decided to grant the further aid required. The original subsidy was to be given by a guarantee of bonds, the Government to pay the interest for a fixed period. It has now been decided that the Government will build the bridges, with their approaches, and the railway will be granted the free use of them for 15 years, after which the gross earnings of the bridges will be receivable by the Department. The gross earnings of the bridges is to be such proportion of the gross earnings of the railway as the cost of the bridges bear to the combined cost of the bridges and the railway. It is estimated that the bridges will cost about $3,000,000. The original agreement provided for the guarantee of bonds for $1,000,000 towards the building of these bridges. (June, pg. 267.)

Toronto, Hamilton and Buffalo Ry.—At a dinner in Brantford, Ont., June 4, during the excursion of the Hamilton, Ont., Board of Trade, G. C. Martin, General Freight and Passenger Agent, T.H. and B. Ry., is reported to have said that all arrangements had been completed by the company for a branch line from Smithville to Dunnville, Ont., and that construction work would be started very soon. The line is to be ready for operation by Jan. 1, 1915. (June, pg. 267.)

The Western Dominion Ry. Co. was originally incorporated by the Dominion Parliament in 1912, and Parliament has now extended the time for starting construction for one year, and authorized amalgamation with the Alberta Pacific Ry. under the title of the W.D. Ry. Co. O. E. Culbert, Calgary, Alta., is Secretary. We are advised that contracts are about to be let for the building of the first section of the line.

Press reports state that it has been arranged to start work immedlately, and that instead of building about 100 miles as originally proposed, the line will be extended to the International boundary, and there make connection with a branch of the Chicago, Milwaukee and St. Paul Ry., now under construction from Gerent Falls, Mont. The financing for the construction of the section of the line from Calgary to the newly discovered oil regions, it is said, has been arranged, and it is reported that a site for yards, etc., has been secured on the Canadian Petroleum Products Co.'s townsite. The line will touch Okotoks, Pekisro, Lunch Creek (crossing the Crowsnest Pass line of the C.P.R.), Pincher Creek and Cardston, and run to the International boundary. W. C. Teter, New York, is President of the W.D.R. Co. M. M. Mann, Chief Counsel of the Chicago, Milwaukee and St. Paul Ry., is a director, and J. H. N. Cornell is Chief Engineer.

The Minister of Railways has approved of the route from Calgary on condition that construction is started within three months, and has granted the Calgary and Fernie Ry. running rights into Calgary from 18 miles out. If this section of the line is not started within the three months and completed within a reasonable time the C. and F. Ry. may then build on its own survey.

A press dispatch states that a contract for grading on the first 100 miles from Calgary has been let to the G. H. Webster Co., Calgary, and a contract for 4,000,000 ft. of timber trestle work, and 12,000 cubic yards of concrete culverts to the Forest City Paving Co., Calgary. (June, pg. 268.)

Winnipeg.—The Mayor of Winnipeg and a deputation from the City Council made a trip of inspection, on June 10, over the railway line under construction from Transcona to Shoal Lake, Man., in connection with the Greater Winnipeg Water Supply. A large amount of construction has been done and 2.5 miles of steel had been laid on the main line. (May, pg. 215.)

Master Boiler Makers' Association.—The eighth annual convention was held at Philadelphia, Pa., recently under the presidency of T. W. Lowe, General Boiler Inspector, C.P.R. A report was submitted by H. W. Armshaw, C.P.R., relating to experiments on the C.P.R. Western Lines in connection with water treatment.

There are said to be 95 gravity or hump yards, on 30 different railway systems. Of these, four are known to be in Canada, three on the C. P. R., and one on the Michigan Central Rd.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canada Steamship Lines, Ltd.—M. CUSSEN, heretofore Auditor Passenger Receipts, has been appointed Assistant to the Comptroller. Office, Montreal.

J. T. BRENNAN has been appointed Auditor of Passenger Receipts. Office, Montreal.

Canadian Northern Ry.—D. CROMBIE, heretofore Inspector of Transportation, Pere Marquette Rd., Detroit, Mich., has been appointed Inspector of Transportation, C.N.R. Office, Toronto.

Canadian Pacific Ry.—N. S. DUNLOP, heretofore Tax and Insurance Commissioner and Claims Adjuster, has been appointed Insurance and Tax Commissioner. The company's fire and marine insurance and matters relating to general taxation will hereafter be under his supervision. Office, Montreal.

F. R. HANEY, heretofore Assistant Tax and Insurance Commissioner, has been appointed acting Claims Adjuster, vice N. S. Dunlop, Tax and Insurance Commissioner and Claims Adjuster, appointed Insurance and Tax Commissioner. Office, Montreal.

R. W. McCORMICK, heretofore Superintendent, District 3, Eastern Division, Montreal, has been appointed Superintendent, District 1, Eastern Division, vice W. B. Way transferred. Office, Farnham, Que.

J. K. McNEILLIE, heretofore Superintendent, District 2, Eastern Division, has been appointed Superintendent, District 3, Eastern Division, vice R. W. McCormick transferred. Office, Montreal.

JAMES M. BARRETT has been appointed Superintendent, District 2, Eastern Division, vice J. K. McNeillie transferred. Office, Windsor St. Station, Montreal.

F. M. BREEN has been appointed Superintendent, Sleeping, Dining and Parlor Cars and News Service, District 1, which embraces lines east of Toronto and Sudbury. Office, Glen Yard, Montreal.

JOHN PRENDERGAST, heretofore fitter, has been appointed assistant foreman at Glen Yard, Montreal, vice M. Miller, promoted.

M. MILLER, heretofore assistant foreman at Glen Yard, Montreal, has been appointed Locomotive Foreman, Ottawa, vice R. H. McDonald, who returns to the bench.

R. L. JOHNSTON, heretofore Assistant Trainmaster, Farnham, Que., has been appointed Assistant Trainmaster, Toronto. This is a new position. The former position has been abolished.

J. McAULEY, heretofore extra gang foreman, North Bay, Ont., has been appointed Roadmaster, North Bay Subdivision, Lake Superior Division, Mattawa, Ont., vice W. Owens transferred.

F. JOHNSON, heretofore Day Shop Foreman, Winnipeg, has been appointed Night Locomotive Foreman, Transcona, Man.

Dr. A. W. MOODY, has been appointed Chief Surgeon, Manitoba Division, Winnipeg, vice Dr. R. J. Blanchard, resigned, and not Chief Surgeon, Western Lines, as reported in our last issue.

J. M. WILLARD, heretofore Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Manitoba Division, Winnipeg, has been appointed Assistant General Superintendent, same department, Western Lines. Office, Winnipeg.

B. E. JOHNSON has been appointed Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Manitoba Division, vice J. M. Willard promoted. Office, Winnipeg.

R. SPROULE, heretofore foreman at Fort William, Ont., has been appointed Day Shop Foreman, Winnipeg, vice F. Johnson promoted.

JAS. DUNCAN, heretofore section foreman, Arborg District, has been appointed Assistant Roadmaster, Winnipeg.

C. G. WASHBON, heretofore Resident Engineer, Brandon, Man., has been appointed Trainmaster, Souris, Man.

F. A. BOWELL, heretofore at Sutherland, Sask., has been appointed Locomotive Foreman, Moose Jaw, Sask., vice C. H. Baynham, transferred.

C. H. BAYNHAM, heretofore Locomotive Foreman, Moose Jaw, Sask., has been appointed Locomotive Foreman, Swift Current, Sask., vice A. J. Pentland, transferred to Ignace, Ont., as announced in our last issue.

J. A. MacGREGOR has been appointed Acting Superintendent, District 2, Alberta Division, vice F. Walker, on leave of absence. Office, Calgary.

H. M. TAIT, heretofore General Agent, Passenger Department, Minneapolis, Minn., is reported to have been appointed General Agent, Passenger Department, Calgary, Alta.

T. J. WALL, heretofore General Agent, Passenger Department, Spokane, Wash., has been appointed General Agent, Passenger Department, Minneapolis, Minn., vice H. M. Tait, transferred.

Grand Trunk Pacific Ry.—The following station agents have been appointed:—Lazare, Man., G. A. Swan; Coblenz, Sask., W. H. Bergman; Mawer, Sask., W. Norman.

Grand Trunk Ry.—H. H. HAMILL, heretofore Travelling Freight Agent, New York, has been appointed Commercial Agent, Detroit, Mich., vice Jas. McPeak, on temporary leave of absence.

J. B. GAUT, heretofore Assistant Engineer on valuation, has been appointed Superintendent of Bridges and Buildings, Chicago, Ill., vice C. O. Busbey.

The following station agents have been appointed:—St. Liboire, Que., A. E. Boulay; Napanee, Ont., G. V. Savage; Washago, Ont., S. Johnston; New Hamburg, Ont., H. Phillips; Brussels, Ont., J. L. Taylor; Dalkeith, Ont., D. J. McIntosh; Golden Lake, Ont., J. L. Foster; Wilno, Ont., P. J. Corkery; Edgington, Ont., J. M. Smith; Burnt River, Ont., W. Ellis; Grimsby Beach, Ont., Pass., F. B. Russ.

Greater Winnipeg Water District.—J. C. NELSON is reported to have been appointed Traffic Superintendent of the railway which is being built from Winnipeg to Shoal Lake, in connection with the construction of the Greater Winnipeg Water District supply.

Great Lakes Transportation Co.—JAMES PLAYFAIR, formerly Vice President and General Manager, Richelieu and Ontario Navigation Co., has been elected President, Great Lakes Transportation Co.

D. J. BOURKE has been appointed Traffic Manager. Office, Windsor, Ont.

Northern Navigation Co.—J. I. HOBSON, Treasurer, Canada Steamship Lines, Ltd., Montreal, has also been appointed Treasurer, N.N. Co.

F. S. ISARD, Comptroller, Canada Steamship Lines, Ltd., Montreal, has also been appointed Comptroller, N.N. Co.

J. T. BRENNAN has been appointed Auditor Passenger Receipts. Office, Montreal.

T. SCARLETT has been appointed Auditor Freight Receipts. Office, Montreal.

Ottawa and New York Ry., New York Central and Hudson River Rd.—S. R. PAYNE, heretofore Assistant to General Manager, N.Y.C. & H.R.R., Rochester, N.Y., has been appointed Manager, O. & N.Y.R., and of the Ottawa Division, N.Y.C. & H.R.R., vice H. W. Gays, deceased. Office, Ottawa, Ont.

Reid Newfoundland Co.—J. M. LYONS, formerly General Passenger Agent, Intercolonial Ry., Moncton, N.B., is reported to have been appointed Eastern Traffic Agent, Reid Newfoundland Co., with office at Moncton, N.B.

Toronto, Hamilton and Buffalo Ry.—W. T. KUHN, heretofore Master Mechanic, has been appointed Superintendent of Motive Power, the duties of Master Mechanic being handled through his office. Office, Hamilton, Ont.

Winnipeg Commercial Traffic Men's Association.

The objects of this association are the organization of men having charge of traffic or customs matters for merchants and manufacturers in Winnipeg and district, for the purpose of correcting irregularities and inconsistencies in charges for transportation and to deal with disputes which may arise between members of the association and transportation companies; to secure improved transportation; the gathering and dissemination of data in relation to subjects of interest to members; the amendment of business customs whereby commercial interests may be benefited; to deal with matters regarding customs charges and regulations; to affiliate with other organizations where it is thought such affiliation will serve the best interests of the association; to establish closer ties of business association, and such other objects as members of the association may determine. The membership consists of men engaged in handling transportation and customs matters for mercantile and manufacturing businesses, each firm or company being limited to one vote.

The officers are:—President, T. H. Van Every, Traffic Manager, Marshall Wells Hardware Co.; Vice President, F. C. Barnes, Traffic Manager, Stobarts, Ltd.; Secretary-Treasurer, G. E. Carpenter.

Track Elevation in Montreal.—The City Engineer's department submitted a report to the Board of Control, June 15, dealing with the question of the elimination of level crossings and grade separation in Longue Pointe Ward. The report states that the railway tracks in the ward will ultimately have to be elevated, as it would not be wise to adopt a policy of subways. The estimated cost of the work at eight different points would be $4,000,000. At present neither the street railway traffic nor the railway traffic is sufficiently dense to justify the work being undertaken. The Board was recommended to take the necessary steps to apply to the Board of Railway Commissioners for establishing level crossings at the points suggested, as there is at present only one point at which the people have a legal right of crossing within over three miles.

C. P. R. Shares.—Information published recently shows that the 2,600,000 shares outstanding are distributed among 34,589 shareholders. Of these 9,466 hold 10 shares each, 17,473 20 shares each, 26,834, 50 shares each and under, 30,203, 100 shares each and under, and 32,599, 200 shares each and under. Nearly all the 4% perpetual debenture stock and the 4% preference stock is held in Great Britain, and of the common stock, Great Britain holds about 60%, the European Continent about 15%, and about 23% is evenly divided between Canada and the United States.

National Transcontinental Railway Construction.

The Dominion Parliament has passed an act amending sec. 9, chap. 71, of the statutes of 1903, as amended by sec. 1, chap. 39, of the statutes of 1912, constituting the National Transcontinental Railway Commission, providing that the Minister of Railways shall be eligible to be appointed to discharge the duties of such commissioner, and that after the completion of the line and before its being leased to the G.T. Pacific Ry., the Minister shall have power to operate the line in whole or in part, as a Government railway under the provisions of chap. 36, of the Revised Statutes of 1906.

The House of Commons, on June 5, voted $6,666,666.66 on account of construction of the line, and on June 8, a further sum of $1,000,000 was voted on construction account. In the course of the discussion on these votes, the acting Minister of Railways stated that the "sags" on the line, about which complaint had been made, were to be found between 200 miles east and 100 miles west of Cochrane, Ont.; there are 32 "sags" in all, and $200,000, according to the estimate of the Chief Engineer, will be sufficient to remove them all. The two east of Cochrane could yet be removed by the contractors, and those west could be removed either by contract or by the G.T. Pacific Ry. after the line is taken over for operation. The "sags," or momentum gradients, were left in the line in order to accelerate its completion, with the intention of removing them at a later date. It was subsequently announced that the Government intended to remove them, so that the line will have the original gradient all through.

A vote of $1,000,000 was made towards the construction of a branch line into Montreal. It is the intention of the Government, the Minister of Railways stated, to have surveys made at once, and some construction may be undertaken. The Premier added that the line will be about 300 miles long, and will have to be built through a pretty rough country. A subsidy had been voted for a line from Montreal to the N. T. R., but it had not been possible for the private owners to carry out the plan. As a matter of fact two lines have been projected to give this connection, one the Joliette and Lake Manuan Colonization Ry., and the other tha North Ry., which, projected to a point on Hudson Bay, would cross the N.T.R. at Belle River.

It is expected that an early start will be made upon the building of a railway station and a covered platform on the Champlain market site, Quebec. The tenders for this work are under consideration by the Government.

A further sum of $1,000,000 has been voted by the Dominion Parliament on account of the construction of the Quebec Bridge. (June, pg. 274.)

Grand Trunk Pacific Railway Construction.

J. G. LeGrand, Bridge Engineer, Grand Trunk Pacific Ry. and President, Western Canada Railway Club, in speaking at a meeting of the club in Winnipeg recently, in reference to the construction of the G.T. P.R., said the first sod was turned on Aug. 29, 1906, near Pine Creek, about 12 miles north east of Carberry, Man., by James Howard, foreman of the Macdonald MacMillan Co. The first track was laid in Oct., 1906, west of Portage la Prairie. The first regular train left Winnipeg for Edmonton, Sept. 21, 1908. Since Oct., 1906, 1,747.4 miles of main line have practically been built; also 1,283 miles of branch lines. Adding 600 miles for sidings, terminals, tracks for ballast pits, etc., it means that about 3,600 miles have been built in about 2,300 working days, which is an average of over 1½ miles a day. If to this is added the part of the line built by the National Transcontinental Ry. Commission between Moncton and Winnipeg it means that pretty nearly three miles a day have been built during the past seven years.

The Dominion Parliament has guaranteed a further issue of bonds for $16,000,000, at 4%, redeemable in 1962, in order that the line may be completed. They are secured by a new trust deed in which all the property of the company is mortgaged, subject to the mortgages already created, and such priority of other charges as may hereafter be created, as shall be approved by the Governor in council. It is also provided that no part of the funds obtained from the sale of the bonds shall be used other than for expenditure approved by the Government for three-fourths of the cost of the Mountain Division, inclusive of interest on bonds issued for the completion of that section, and of interest upon advances made under the Loan Act of 1913, and for interest upon the present securities until the expiration of three years after the final completion of the line from Winnipeg to Prince Rupert. The company and the G.T.R. shall join in a release of all rights to any further guarantee, payment or aid of any description in respect of the building of the line. The date final for the completion of the line is extended to Dec. 31, 1915.

M. Donaldson, Vice President and General Manager, after a trip of inspection over the line as far as Prince George, B.C., recently is reported to have stated that there was a gap of 150 miles on which there was a good deal of work to be done before regular trains could be operated over it. The ballasting and station building work is reported completed as far west as Prince George, and the steel bridge across the Fraser River there is practically completed. This replaces the wooden trestle built to enable the line to be laid into the town. Ten steam shovels with large gangs of men are ballasting the line west of Prince George to the point where the gangs working east are engaged in similar operations. It is expected that all the work will be completed by Dec. 31.

It is expected that the company's floating dock at Prince Rupert will be completed by Dec. 31. The ship repairing plant, in connection with the dock, is rapidly approaching completion.

Grand Trunk Pacific Branch Lines.—We are officially advised that the company's engineers have no information as to the intention to construct a new coal handling plant at the mouth of Mission River, Fort William, Ont., as stated in recent press reports.

Grading was reported as being practically completed June 16, on the branch line from Talmage into Weyburn, Sask. Tracklaying was expected to be done by June 30. The terminal site in Weyburn has been laid out, but no buildings have been erected.

It is expected that the line from Regina to Moose Jaw, Sask., will shortly be opened for traffic. From Moose Jaw, the line now extends to Mawer, to which point a train service is in operation. Track has been laid for some distance on the 10 miles of grading completed northwesterly of Mawer. The present end of construction on this line is at the South Saskatchewan River, but it is expected that at a later period this branch will be extended to the main line, and when this work is completed it will enable trains to be run through from Northgate, on the International boundary, via Regina to two points on the main line—one east and one west.

A daily passenger service was put in operation on the line into Calgary, Alta., June 7, replacing the weekly service heretofore given; and a daily freight service was started June 8. The question of building a track for the transfer of freight with the C.P.R. is under consideration. (June, pg. 274.)

British-Canadian Financial House in Difficulty.

The banking house of Chaplin, Milne and Grenfell, Ltd., London, Eng., suspended payment recently, and its affairs were taken over for liquidation by a committee of bankers, including, it is stated, the Bank of England, the Bank of Montreal, and R. Fleming, who is largely interested in the Lake Superior Corporation. The suspended bank was heavily interested in G.T.R. stocks, and other Canadian securities, particularly in Western Canada lands. Following this suspension, on June 8, the Canadian Agency, Ltd., of which A. M. Grenfell was chairman, also went into liquidation, Sir William Pender being given charge by the courts. It is stated that while the liabilities of the bank are very heavy, they will be met in full as the securities held are valuable, but not readily realizable, and that the suspension of the bank is due almost entirely to its advances to the Canadian Agency. This institution, according to statements made, was endeavoring to secure such an interest in the G.T.R. as would ensure the establishment of a directorate in Canada "not hostile to the London Board"; also the accumulation of Lake Superior Corporation stock "in order to reform its affairs." The L.S.C. owns the Algoma Central and Hudson Bay Ry., the Algoma Eastern Ry., the Algoma Central Terminals Co., electric railways at Sault Ste. Marie, Ontario and Michigan, and various industrial companies. The Agency was also dealing in Canadian Northern Ry. securities. Various estimates have been made as to the liabilities to the public, but nothing can be known definitely until the official liquidator has made his investigation. It is expected, however, that the net liability, outside the few shareholders of the Agency, will be smaller than at first estimated.

Block Signalling on the Intercolonial Ry.—On a vote of $100,000 for the installation of block signalling on the Intercolonial Ry. in the House of Commons, recently, the acting Minister of Railways stated that the system had been established from St. John to Hampton, N.B., 20 miles; Moncton to Painsec Jct., N.B., 7 miles; Windsor Jct. to Halifax, N.S., 1 miles, and Truro to Oxford Jct., N.S., 46.5 miles. In connection with additional installations, he stated that the heaviest part of the work will be finished next year, but he did not know that all the road will necessarily be under the block system.

American General Baggage Agents' Association.—At the annual convention at Detroit, Mich., June 17 to 19, G. Alley, General Baggage Agent, Union Pacific Rd., was elected President, and J. P. Dugan, Baltimore and Ohio Rd., Vice President, for the current year, while J. E. Quick, General Baggage Agent, G.T.R., and G. T. Pacific Ry., was elected Secretary-Treasurer, for the 30th consecutive year. It was decided to hold the 1915 convention at Los Angeles, Cal.

Mainly About Transportation People.

G. M. BOSWORTH, Vice President, C.P.R., returned to Canada, June 10, from England.

Lady Tait, wife of SIR THOMAS TAIT, and Miss Tait, are spending the summer in Maine.

A. W. SMITHERS, Chairman of the Board, G.T.R., has arrived in London, Eng., after his annual visit to Canada.

C. NUGENT, a C.P.R. bridge inspector, was killed at Hamilton, Ont., June 1, by being thrown from his motor cycle.

MARSHALL MacGREGOR, General Canadian Agent, Erie Rd., Toronto, was married there, June 4, to Miss M. A. Hettger.

HON. H. R. EMMERSON, M.P. for Westmorland, N.B., is reported to be seriously ill at his home in Dorchester, N.B.

Mrs. Elliott, wife of E. C. ELLIOTT, chief clerk, Passenger Department, G.T.R., Montreal, died there, June 12, after a long illness.

F. A. SKELTON, Secretary-Treasurer, Canadian Car and Foundry Co., Ltd., Montreal, has been elected a director of the company.

SIR WILLIAM VAN HORNE, accompanied by his son, sailed from Quebec, June 4, for England, expecting to return about the middle of July.

D. B. SCOTT, who retired as Chief Electrician, Intercolonial Ry., about two years ago, died at Moncton, N.B., recently, after a long illness.

C. A. BENNETT, chief clerk to General Manager, Eastern Lines, C.P.R., Montreal, has resigned to join the North American Life Assurance Co.'s staff.

R. HOBSON, Vice President and General Manager, Steel Co. of Canada, has been elected a director of the Bank of Hamilton, to succeed the late Senator Gibson.

C. N. MONSARRATT, M. Can. Soc. C.E., Chairman and Chief Engineer, Board of Engineers, Quebec Bridge, returned to Montreal, June 6, from Great Britain.

W. B. LANIGAN, Assistant Freight Traffic Manager, Western Lines, C.P.R., returned to Winnipeg, June 3, after a holiday trip, with Mrs. Lanigan, to Japan.

DAVID POTTINGER, I.S.O., formerly Assistant Chairman, Government Railways Managing Board, Moncton, N.B., and Mrs. Pottinger, are spending some time in Europe.

R. LOWE, who died at London, Ont., June 8, aged 82, was in the G.T.R. service for over 50 years. He was retired under the pension rules some time ago when acting as Roadmaster.

T. R. McCARTHY, who acts as agent for a number of vessels trading to Montreal, has recovered from a serious illness involving an operation, and has left the Montreal General Hospital.

GEORGE CONDON, representative at Montreal for the National Steel Car Co., Ltd., spent the Ontario Jockey Club's spring race meeting week with Sir Donald Mann, at Fallingbrook, Toronto.

E. ARNOLD, Freight Claims Agent, G.T.R., Montreal, heretofore Second Vice President, Freight Claim Association, was elected First Vice President, at the recent convention at Galveston, Tex.

Miss Edith Shaughnessy, daughter of SIR THOMAS SHAUGHNESSY, was married at Montreal, June 3, to R. M. Redmond, of Montreal. They sailed from Montreal, June 5, for Europe.

E. S. MORRISON, Resident Engineer, and R. MORRISON, timekeeper, on construction, C.N. Pacific Ry., at Blue River, B.C., were reported drowned in the Fraser River about 140 miles north of Kamloops, June 4.

J. A. M. AIKINS, K. C., M. P., who was knighted on the King's birthday, was, from the inception of the C.P.R., until his election as M.P. for Brandon, Man., Local Solicitor for the company at Winnipeg.

J. A. MURPHY, chief clerk to General Superintendent, Ontario Lines, G.T.R., Toronto, was married at Sarnia, Ont., recently to Miss M. Hickey. He was presented with a cabinet of silver and an address by his associates.

MORGAN BRANSBY WILLIAMS, who is said to have had more to do than any other man with the construction of the earlier railways in the British Isles, and who also built many of the Italian and Russian railways, died in England recently.

R. G. CHAMBERLIN, Chief of the Department of Investigation, C.P.R., Montreal, while on a visit to Vancouver, B.C., recently, was entertained to dinner by the police force of that city, where he was formerly Chief.

SAMUEL KING, of London, Ont., who formerly occupied important mechanical positions with the Canadian Pacific and Intercolonial Railways, and with the Canada Car Co., has been elected a director of the National Steel Car Co., Ltd., Hamilton, Ont.

H. E. WHITTENBERGER, General Superintendent, Ontario Lines, G.T.R., Toronto, who recently underwent an operation at the Wellesley Hospital, Toronto, is recuperating at his home, and expects to be able to return to duty during July.

M. D. CARDER, who died in Toronto recently, after being Grand Recorder, Ancient Order United Workmen of Ontario, for 35 years, was previously to that chief clerk in the Canada Southern Ry. Freight Department at St. Thomas, Ont.

H. S. HOLT, director, C.P.R., has resigned from the board of the Canadian Car and Foundry Co., on account of the large demands made on his time by the various companies with which he is connected, making it necessary for him to curtail his duties.

H. A. YOUNG, formerly Traffic Manager, Canadian Lake Line, and who last season was Assistant to Freight Traffic Manager, Richelieu and Ontario Navigation Co., has bought the business of Ontario Storage and Cartage Ltd., Toronto, and will devote his entire time to it.

E. F. KIFT and W. B. FLEMING, Toronto, have been appointed notaries public for five years, with jurisdiction in places which are not cities and towns of over 5,000 population, in matters relating to the Canadian Northern Ontario Ry., and to Mackenzie, Mann and Co., Ltd.

J. A. RICHARDSON, District Passenger Agent, Wabash Rd., Toronto, who broke his collar bone and sustained other injuries, at his home recently, is progressing favorably. He was at his office during the latter part of June, and expects to be fully recovered shortly.

E. G. JACKSON, Sales Manager, Canadian Car and Foundry Co., Ltd., Canadian Steel Foundries, Ltd., and Pratt and Letchworth, Ltd., Montreal, has resigned to go into business for himself. He is about to spend three months in Europe, and on his return will open an office in Montreal.

The will of the late WILLIAM WAINWRIGHT, Vice President, G.T.R. and G.T. Pacific Ry., directs his estate to be divided, half to the sons and half to the daughters, subject to a few charitable bequests. The family residence in Montreal is to be maintained until the youngest comes of age.

In Canadian Railway and Marine World for April, under the heading of Birthdays of Transportation Men, the date of the birth of J. H. JOHNSTON, Superintendent of Bridges and Buildings, Eastern Lines, G.T.R., Montreal, was given as Apr. 22, 1860, instead of Apr. 22, 1866.

ALEXANDER STEWART, Assistant Chief Engineer, Great Northern Ry., Seattle, Wash., who died there, June 6, was chiefly concerned with the western lines, and supervised the work being carried out by the G.N.R. in the neighborhood of Vancouver, including the reclamation work at False Creek, and dock work at Burrard Inlet.

ROBERT SPROULE, who has been appointed Shop Foreman, C.P.R., Winnipeg, was born in County Tyrone, Ireland, Mar. 21, 1876, and entered railway service in 1898, since when he has been, to 1903, apprentice, Belfast and Northern Counties Ry. He came to Canada in 1903, and has since been engaged in general work, and as night foreman and day foreman, C.P.R.., Fort William, Ont.

H. M. KERSEY, Manager in Chief of Ocean Services, C.P.R., London, Eng., has written to the committee of management of the training ship Conway, stationed in the Mersey, near Liverpool, offering 10 competitive scholarships for cadets, on condition that those holding them undertake to join the C.P.R. ocean service, either on leaving the Conway, or on completion of 12 months training as a reserve midshipman in the Royal Navy.

J. W. BLACK, of the Intercolonial Freight Department, Sydney, N.S., who retired from service at the end of May, entered I.R.C. service in 1882 as station master at Salt Springs, remaining there until he was transferred to the Freight Department at Sydney. During the time he was at Salt Springs he also acted as agent for the Western Union Telegraph Co. He left Sydney early in June for a trip to the Pacific coast.

W. J. PUGSLEY, of the C.P.R. Steamship Department, Montreal, who died at Ste. Agathe, Que., June 11, after a prolonged illness, was born in Jersey, Channel Islands, and came to Canada about 20 years ago, when he entered C.P.R. service. He was appointed Passenger Agent at Liverpool, Eng., about five years ago, and about the end of 1911 he was, on account of health, transferred to Montreal, and his previous position abolished.

X. H. CORNELL, who recently resigned as Superintendent of Transportation, Pere Marquette Rd., Detroit, Mich., on his appointment as Master of Transportation, Chicago and Alton Rd., Bloomington, Ill., was, from 1903 to Nov. 30, 1909, consecutively, Chief Dispatcher, Trainmaster and Master of Transportation, Western Division, G.T.R., Durand, Mich. He was subsequently Chief Supervisor, Michigan Car Demurrage Supervising Bureau, and Inspector of Transportation, Toledo, St. Louis and Western Rd., and Chicago and Alton Rd.

G. A. McCARTHY, who has been appointed Engineer of Railways and Bridges for the City of Toronto, graduated from McGill University in 1898, and for seven years prior to 1894 was engaged in the Intercolonial Ry. Engineering Department, Moncton, N.B. He was Principal Assistant Engineer, Canadian Niagara Power Co., Niagara Falls, Ont., 1901 to 1905; Chief Engineer, Timiskaming and Northern Ontario Ry., North Bay, Ont., 1905 to 1909, and from 1909 to 1913 was engaged in general engineering work, chiefly in heavy

concrete and steel construction, in western Canada and the western U.S.

E. H. FRITCH, Secretary, American Railway Engineering Association, Chicago, spent a few days in Toronto at the end of June, visiting his brother, L. C. Fritch, Assistant to President, Canadian Northern Railway.

CLAUDE LESLIE REEVE, whose appointment as chief clerk, Stores and Mechanical Accounts, C.P.R., Vancouver, B.C., was announced in our last issue, was born in Hampshire, Eng., Oct. 31, 1873, and entered C.P.R. service, July 20, 1905, since when he has been, to Aug. 14, 1905, car repairer; Aug 15, 1905, to Jan. 24, 1906, invoice clerk; Jan. 25 to Oct. 27, 1906, time keeper; Oct. 28, 1906, to July 31, 1910, report clerk; Aug. 1, 1910, to May 1, 1914, head clerk and customs clerk, all at Vancouver, B.C.

A London, Eng., press dispatch states that the personal property left by the late LORD STRATHCONA amounted to $23,257,010. The actual value has not been made public, but the duty paid, $4,189,190, is stated to indicate that the total value was $28,929,000. Some of the late Lord Strathcona's holdings in America were:—C.P.R., $4,112,000; Bank of Montreal, $645,000; Laurentian Co., $466,000; Dominion Steel Corporation, $400,000; Great Northern Ry., $6,660,000; Northern Pacific Ry., $3,380,000.

G. de W. ARCHIBALD, A.M. Can. Soc. C.E., who has been appointed City Engineer, Saskatoon, Sask., was recently engaged with Baldry, Yerburgh and Hutchinson, contractors on section 2 of the Welland Ship Canal, St. Catharines, Ont. He commenced engineering in 1900 as rodman, draughtsman, etc., for the Nova Scotia Steel and Coal Co., later for the Dominion Iron and Steel Co., and was subsequently engaged in location and construction work, G.T. Pacific Ry., and from 1907 to 1912 was Engineer in Charge of Maintenance and Construction, Canadian Northern Ry.

FRANK LOUIS WILLIS, who was recently appointed Locomotive Foreman, C.P.R., McAdam Jct., N.B., was born at St. John, N.B., June 11, 1884, and was, from Feb., 1899, to July, 1903, apprentice, Phoenix Foundry, Marine and Locomotive Works, St. John, N.B.; July 14, 1903, to Apr. 10, 1904, third engineer, s.s. Louisburg, Black Diamond Steamship Co., sailing out of Sydney, N.S.; Mar. 18, 1904, to Dec. 1, 1908, machinist, C.P.R., McAdam Jct., N.B.; Jan. 1, 1909, to Jan. 1, 1911, charge hand, C.P.R., McAdam Jct.; Jan. 1, 1911, to Apr. 1, 1914, Assistant Foreman, C.P.R., McAdam Jct.

HENRY K. YORK, whose appointment as Car Foreman, C.P.R., Transcona, Man., was announced in our last issue, was born at Victoria Corner, Carleton County, N.B., Mar. 20, 1881, and entered C.P.R. service Dec. 3, 1903, since when he has been, to June 30, 1904, car repairing, Fort William, Ont.; June 30, 1904, to Feb. 28, 1905, air brake tester, Fort William, Ont.; Feb. 28, 1905, to May 20, 1906, Car Inspector, Fort William, Ont.; May 20, 1906, to May 1, 1908, Assistant Car Foreman, Fort William, Ont.; May 1, 1908, to July 1, 1910, Car Foreman, Ignace, Ont.; July 1, 1910, to Apr. 27, 1914, Car Foreman, Kenora, Ont.

ERNEST BOWER, who has been appointed Travelling Passenger Agent, Canadian Northern Ry., Saskatoon, Sask., was born at Nottingham, England, Jan., 17, 1889, and entered transportation service in Apr., 1907, since when he has been, to Apr., 1910, consecutively, stenographer, baggage master and ticket clerk, Canadian Northern Ry., North Battleford, Sask.; Apr., 1910, to Dec. 1, 1912, chief clerk and Travelling Passenger Agent, Canadian Northern Steamships, Ltd., Winnipeg; Dec. 1, 1912, to Jan. 15, 1913 (during which time the C.N.S. Winnipeg office was closed), ticket stock clerk, C.N.R., Winnipeg; Sept. 30, 1913, to May 15, 1914, ticket agent, Union Station, Edmonton, Alta.

The will of the late SIR WILLIAM WHYTE has been probated at $587,199, the chief beneficiary being Lady Whyte. In addition to receiving the major portion of the estate, she gets $31,000 insurance, which, it is stated, is not to be considered as part of the estate. She receives approximately $175,000, to be derived from the sale of Winnipeg Electric Ry. stock, which is to be invested for her benefit, and on her decease to be divided into six equal shares, one share to go to each of four daughters, and the remaining two shares to the son. Other amounts bequeathed are:—$5,000 to a sister, $3,000 and $10,000 to two brothers respectively, $1,000 to Winnipeg General Hospital, $1,000 to Manitoba College, and $2,000 to Rev. Dr. DuVal, Winnipeg, Sir William's pastor.

CLAIR MALCOLM, who has been appointed chief clerk, Auditor of Stores and Mechanical Accounts, Alberta Division, C.P.R., Calgary, was born at Tatamagouche, N.S., Oct. 18, 1881, and entered C.P.R. service in the Stores Department, May 1, 1899, since when he has been, to Dec. 1900, clerk and storeman, Vancouver, B.C.; Dec. 1900 to May 1901, storekeeper, Smelter Jct. B.C.; May 1901 to Jan. 1905, clerk, Vancouver, B.C.; Jan. 1905 to Feb. 1906, chief clerk, Calgary, Alta.; Feb. to Dec. 1906, Assistant Inspector, Auditor of Stores and Mechanical Accounts, Western Lines, Winnipeg; Dec. 1906 to Dec. 1908, Assistant Inspector, Auditor of Stores and Mechanical Accounts, Eastern Lines, Angus Shops, Montreal; Dec. 1908 to Apr. 1914, clerk, same department, Angus Shops, Montreal.

CORNELIUS E. LEGG, whose appointment as Trainmaster, Winnipeg Terminals, C.P.R., was announced in our last issue, was born in Illinois, Nov. 15, 1864, and entered railway service in 1882, since when he has been, to 1886, telegraph operator, Chicago, Rock Island and Pacific Ry., at various places in Iowa; 1886 to 1889, agent, Chicago Great Western Ry., at various places in Iowa; 1889 to 1891, brakeman, same road; 1891 to 1897, freight conductor, same road, Des Moines, Ia.; 1897 to 1899, passenger conductor, same road; 1899 to 1900, Yardmaster, same road, Leavenworth, Kan.; 1900 to 1912, freight conductor, passenger conductor, agent and Yardmaster, consecutively, Great Northern Ry., at various places in Washington and British Columbia; 1912 to May 1914, General Agent, C.P.R., Fort William, Ont.

STEPHEN REED PAYNE, who has been appointed General Manager, Ottawa and New York Ry., and Manager, Ottawa Division, New York Central and Hudson River Rd., Ottawa, Ont., was born Dec. 21, 1865, and entered railway service Nov. 2, 1882, since when he has been, to Aug. 25, 1889, telegraph operator, Lake Shore and Michigan Southern Ry.; Aug. 25, 1889, to Jan. 15, 1898, dispatcher, same road; Jan. 15, 1898, to Apr. 1, 1900, Trainmaster, same road; May 13, 1900, to Jan., 1903, Trainmaster, and Assistant Division Superintendent, Norfolk and Western Ry., Bluefield, West Virginia; Jan., 1903, to 1907, Train master, New York Central Lines, Utica, N.Y.; 1907 to 1908, Assistant Superintendent, Western Division, New York Central Lines, Syracuse, N.Y.; 1908 to Oct., 1913, Superintendent, Buffalo Division, same road, and General Superintendent, Western Division, same road, Syracuse, N.Y.; Oct., 1913, to June, 1914, Assistant to General Manager, same road, Rochester, N.Y.

DAVID CROMBIE, who has been appointed Inspector of Transportation, Canadian Northern Ry., Toronto, was born at Hamilton, Ont., May 13, 1864, and entered railway service in June 1882, since when he has been, to 1887, telegraph operator, G.T.R.; 1887 to 1889, ticket agent, same road, Chatham, Ont.; 1889 to 1890, dispatcher, same road, London, Ont.; 1890 to 1892, dispatcher, Flint and Pere Marquette Rd., Saginaw, Mich.; 1892 to 1894, car distributor, same road; 1894 to Jan. 1, 1900, Superintendent of Car Service, same road; Jan. 1 to July 1900, Superintendent of Car Service, Pere Marquette Rd., Detroit, Mich.; July 1900 to 1903, Superintendent of Transportation, same road; 1903 to Feb. 1907, in private business; Feb. to Oct. 1907, Master of Transportation, Middle Division, G.T.R., London, Ont.; Oct. 1907 to Nov. 22, 1910, Assistant to General Transportation Manager, same road, Montreal; Nov. 22, 1910 to Jan. 14, 1913, Assistant to Vice President, Transportation, Maintenance and Construction, same road, Montreal; Jan. 14 to Aug. 1, 1913, General Superintendent of Transportation, same road, Montreal; Aug. 1913 to May 1914, Inspector of Transportation, Pere Marquette Rd., Detroit, Mich.

H. N. RUTTAN, M. Can. Soc. C.E., who recently retired as City Engineer, Winnipeg, after nearly 30 years service, has had considerable railway experience. He entered G.T.R. service in 1866, on the engineering staff, and three years later transferred to the Intercolonial Ry., and in 1872-73, was in charge of the engineering and construction of 50 miles of that line along the Baie des Chaleurs. He transferred to the Dominion Government's service in connection with the C.P.R. in 1874, and made some of the first surveys for that line along the north shore of Lake Superior, and in the following year was in charge of a survey party to select a line for the C.P.R. between Edmonton, Alta., and the Yellowhead Pass. He was engaged on this for nearly two years, and located the line now generally followed by the Canadian Northern and Grand Trunk Pacific Rys. From 1877 to 1880 he was in charge of the engineering work between Winnipeg and Kenora (then Rat Portage), and in the latter year he commenced private practice in Winnipeg. He was appointed City Engineer, Winnipeg, in 1886, and has now been retained as Consulting Engineer. He has a retiring allowance from the city of $5,000 a year.

JAMES KERR McNEILLIE, who has been appointed Superintendent, District 3, Eastern Division, C.P.R., Montreal, was born at Toronto, Feb. 23, 1874, and entered railway service in May, 1890, since when he has been, to Nov., 1891, call boy and apprentice, G.T.R., Lindsay, Ont.; Nov., 1891, to Sept. 1896, apprentice, locomotive fitter and machinist, G.T.R., Point St. Charles, Que.; Sept. 1, 1896, to Nov., 1899, trainmaster's clerk and chief clerk, Superintendent's office, C.P.R., Farnham, Que.; Nov., 1899, to June, 1902, clerk, and chief clerk, General Superintendent's office, C.P.R., Winnipeg; June, 1902, to Feb., 1903, Car Service Agent, C.P.R., Winnipeg; Mar., 1903, to Oct., 1907, Car Service Agent in charge of distribution of passenger equipment, C.P.R., Montreal; Oct., 1907, to July, 1908, Assistant Superintendent of Terminals, C.P.R., Toronto; July, 1908, to Feb., 1909, Superintendent, District 1, Ontario Division, C.P.R., Toronto; Feb., 1909, to Mar., 1911, Superintendent, District 2, Ontario Division, C.P.R., London; Mar., 1911, to Feb., 1913, Superintendent, District 1, Eastern Division, C.P.R., Farnham, Que.; Feb., 1913, to June, 1914, Superintendent, District 2 (Montreal Terminals), Eastern Division, C.P.R., Montreal.

M. M. REYNOLDS, Vice President, G.T.R. and G.T. Pacific Ry., who died at Old Point

Comfort, Va., June 17, had been suffering from Bright's Disease for some time, and his condition became somewhat acute early in the spring, and he left for the south about two months ago. He was born at Syracuse, N.Y., in 1859, and was educated there. He entered railway service with the National Railways of Mexico, where he remained for about 11 years, during the latter part of which he was Auditor. In Jan., 1892, he was appointed General Auditor, Central Vermont Ry., and from 1896 to 1899 acted as Auditor for the receivers of that road, and on the termination of the receivership was reappointed Auditor for the company. In 1902 he was appointed Comptroller, National Railways of Mexico. During 1904 he was also appointed Comptroller, Mexican International Ry., and Interoceanic Ry. of Mexico. He was appointed Fifth Vice President, G.T.R., in charge of the audit department in 1908; in 1910, Fourth Vice President; in 1911, Third Vice President, in charge of the financial department, and on the abolition of the numerical designations of the Vice Presidents, he was appointed Vice President, G.T.R., in charge of the financial department, and also Vice President and a director of the G.T. Pacific Ry.

HENRY W. GAYS, General Manager, Ottawa and New York Ry., Ottawa, who died there, May 31, after an illness of about four months, was born at Brant, Erie County, N.Y., Mar. 21, 1848. He entered railway service Jan. 1, 1861, since when he was, to Dec. 31, 1862, messenger, Erie Rd., Dunkirk, N.Y.; Jan. 1, 1863, to Mar. 31, 1864, telegraph operator, same road, Dunkirk, N.Y.; Apr. 1, 1864, to Mar. 18, 1867, assistant cashier, Buffalo and Erie Ry., Dunkirk, N. Y.; Oct. 1, 1867, to July 31, 1869, cashier, same road, Dunkirk, N.Y.; Aug. 1, 1869, to June 30, 1874, cashier, Louisville and Cincinnati Mail Line Steamers; July 1, 1874, to May 30, 1877, General Agent, same company; June 1, 1877, to Mar. 31, 1879, General Agent, Cleveland, Columbus, Cincinnati and Indianapolis Ry.; Apr. 1, 1879, to Mar. 30, 1885, Assistant General Freight Agent, same road; Jan. 1, 1881, to Apr. 30, 1885, also General Freight Agent, Indianapolis and St. Louis Ry.; July 1 to Oct. 31, 1885, in charge of traffic, Wiggins Ferry Co. and East St. Louis Connecting Ry.; and operated lines at St. Louis, Mo.; Nov. 1, 1885, to May 30, 1886, Superintendent, same companies; June 1, 1886, to Nov. 30, 1889, Manager, same companies; Dec. 1, 1889, to Aug. 1, 1894, General Manager, St. Louis Merchants Bridge and Terminal Ry.; Aug. 1, 1894, to July, 1896, Traffic Manager, St. Louis, Chicago and St. Paul Ry.; July, 1896, to Feb., 1899, General Manager, same road, and Chicago, Peoria and St. Louis Ry.; Feb., 1899, to Apr. 25, 1900, General Manager, New York and Ottawa Rd.; Nov., 1899, to Apr. 25, 1900, also President, and Apr. 25, 1900, appointed Receiver, same road; Mar. 1, 1899, appointed Manager, Ottawa and New York Ry., and Nov., 1899, also President and Receiver, same road, which positions he retained until the New York and Ottawa Rd., which owned the Ottawa and New York Ry., was sold by order of the U. S. Courts, in 1904, to the New York Central and Hudson River Rd., when he was appointed General Manager.

C. P. R. Contracts for Boarding.—The C. P. R. has entered into a contract, we are officially advised, with the Consolidated Boarding and Supply Co., Montreal, for boarding its employes on second track work on the Lake Superior Division. This was formerly done by the Harris Abattoir Co., Toronto.

Railway Finance, Meetings, Etc.

Pere Marquette Rd.—S. A. Felton, Chicago, Ill., resigned as a member of the Board of Receivers, June 4, and the U. S. District Court, sitting at Detroit, Mich., appointed P. H. King, Grand Rapids, Mich., as his successor.

Quebec and Saguenay Ry.—In connection with a report to the effect that the Government would guarantee Q. & S. R. bonds, the Premier stated in the House of Commons, June 1, that there was no legislation in regard to the company in the Government's sessional programme, and that the Governor in council had no power to guarantee bonds.

Toronto, Hamilton and Buffalo Ry.—The following directors have been elected for the current year,—H. B. Ledyard, D. McNicoll, W. H. Newman, Sir Edmund Osler, D. W. Saunders, W. L. Scott, Sir Thomas Shaughnessy, A. H. Smith, W. P. Torrance and W. K. Vanderbilt, Jr.

Temiscouata Ry.—Net earnings for March, $6,472, and for nine months ended Mar. 31, $35,132.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Apr. 21, $83,404, against $124,961 for same period 1913.

Railway Route Maps Approved.

The Minister of Railways and Canals has approved route maps of railways, as follows:—

Toronto Terminals Ry., through Toronto, about 4 miles, May 7.

Canadian Northern Ry., from Grand Marais to Victoria Beach, Man., 14.16 miles, May 7.

Kettle Valley Ry., branch from near Summers Creek, mileage 65.2, via Princeton, to Copper Mountain, 28 miles; and from mileage 60, near Five Mile Creek, to junction with Vancouver, Victoria and Eastern Ry. (G.N.R.), near Princeton, about 13 miles, May 20.

Calgary and Fernie Ry., from Kananaskis Pass to junction with Western Dominion Ry. in Tp. 20, R. 2, w. 5 m., about 48 miles, with running rights over the Western Dominion Ry. from that junction to Calgary, May 20.

Edmonton, Dunvegan and British Columbia Ry., revised location from Tp. 74, R. 18, to Tp. 78, R. 23, w. 5 m., about 45 miles, with the understanding that a branch is to be built to Grouard, Alta., May 20.

Railway Lands Patented.—Letters patent were issued during April, covering Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:

	Acres.
Calgary and Edmonton Ry.	1,451.31
Canadian Northern Ry.	770.82
Canadian Pacific Ry.	6.38
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	4,003.00
Total	6,231.51

U. S. Government Railway in Alaska.—Surveys for the building of a Government railway in Alaska are reported to have been started by a party of engineers in charge of H. Yeyo at Chitina, on the Copper River and Northwestern Rd.

Two lighters, for use of the Department of Railways and Canals, in connection with the work at Port Nelson, on Hudson Bay, were launched by Polson Iron Works, Toronto, May 30. These vessels are 123 ft. long, 21½ ft. wide and 10 ft. deep, and full description has already appeared in Canadian Railway and Marine World. They will proceed to Port Nelson under their own steam, and will carry cargo.

Steam Railways Built Without Dominion Subsidies.

Senator Lougheed replying to questions in the Senate recently, said that during the last 15 years the C. P. R. directly, or through its subsidiary companies, had built 5,033 miles of railway, of which 2,825 had been built in the seven years ended Dec. 31, 1913. These 2,825 miles were built in the several provinces as follows:—Saskatchewan, 1,260; Ontario, 608; Alberta, 478; Manitoba, 154; British Columbia, 125; Quebec, 124; New Brunswick, 80.

The following lines were built by different companies, without any aid from the Dominion Government. The figures give the respective mileages.

BRITISH COLUMBIA:—Bedlington and Nelson, 12.04; British Yukon, 31.2; Crow's Nest-Southern, 74.18; Eastern British Columbia, 16; Kaslo and Slocan 23.37; Morrissey, Fernie and Michel, 5.82; Nelson and Fort Sheppard, 55.42; New Westminster Southern, 23.73; Red Mountain, 9.59; Vancouver, Victoria and Eastern, 236.08; Victoria and Sydney, 16.96; Wellington Colliery Co.'s, 10.75.

QUEBEC:—Carleton and Grenville, 13; Montreal and Atlantic, 163.40; Montreal and Vermont Jct., 23.60; Rutland and Noyan, 3.39; Stanstead, Shefford and Chambly, 43.

MANITOBA.—Brandon, Saskatchewan and Hudson Bay, 69.45; Manitoba and Great Northern, 91.77; Midland of Manitoba, 6.40.

YUKON.—British Yukon, 69.90.

ONTARIO.—London and Port Stanley, 23.66.

NEW BRUNSWICK.—Maine Central, 5.10.

Total, 1,027.83 miles. The form in which the question was put was, "Did any other railway company, (i. e., other than the C. P. R., which built the 5,033 miles since 1899) build any railway without subsidy from the Government?" and the answer was that the lines above mentioned were so built, the inference being that the 5,033 miles of C. P. R. lines built since 1899 were built without subsidy.

New C.P.R. Service, Montreal to Chicago.—Starting May 31, the C.P.R. increased its service between Montreal and Chicago by the addition of two trains, to be known as the Canadian. The westbound train leaves Montreal daily at 8.45 a.m., reaching Toronto at 5.40 p.m., leaving at 6.10, and reaching Detroit at 11.35 p.m., and Chicago 7.45 on the following morning. The eastbound train leaves Chicago daily at 9.30 a.m., reaching Toronto at 11.20 p.m., and Montreal at 9 the following morning. The equipment will comprise standard passenger cars, dining cars, sleeping cars and compartment observation cars. This service has been arranged in conjunction with the Michigan Central Rd., that company's tunnel and line being used from Windsor, Ont., to Chicago. The ordinary service between Detroit and Chicago, via the Wabash Rd., is being continued.

The C. P. R. Has Secured an interim injunction restraining the Ce Pea R. Oil Co., Calgary, Alta., from printing or publishing its corporate name in such a way as to mislead or to induce the public to believe that the C. P. R. is in any way interested in the Company. In all the advertising matter issued the letters C. P. R. in the company's name are in capitals.

J. A. Falardeau, Agent, G.T.R., Doucets Landing, Que., writes: "Enclosed is $2 for the current year's subscription. I value very much every issue of Canadian Railway and Marine World, and beg to say that every railway agent should have it, as it keeps a man posted on what is going on in railway business."

Railway Rolling Stock Notes.

The Intercolonial Ry. has ordered 4 pit cars, 75 tons capacity, from Eastern Car Co.

F. H. Hopkins and Co. have ordered 1 thirty ton Lidgerwood unloader from Canadian Car and Foundry Co.

The Quebec Harbor Commissioners have ordered 2 flat cars, 40 tons capacity, from Canadian Car and Foundry Co.

The Intercolonial Ry. is reported to have placed an order for box cars with the Eastern Car Co.

The Canadian Northern Ry., between May 15 and June 14, received 3 consolidation locomotives from Canadian Allis-Chalmers, Ltd.

The estimates for the current year, voted by the Dominion Parliament, include $1,520,000 for additional rolling stock for the Canadian Government Railways.

The Intercolonial Ry. has received the following additions to rolling stock:—55 box cars, 60,000 lbs. capacity, 6 box cars, 80,000 lbs. capacity, from Canadian Car and Foundry Co.; and 112 box cars, 80,000 capacity, from Nova Scotia Car Works.

The C.P.R., between May 15 and June 15, ordered the following rolling stock from its Angus Shops:—1 steel baggage and express car, 7 vans, 104 steel frame box cars 6 steel flat cars, 1 freight refrigerator car and 5 class U3 locomotives.

The C.P.R. between May 15 and June 15, received the following additions to rolling stock:—137 steel frame box cars, 5 steel colonist cars and 1 class G2 locomotive from its Angus Shops, and 25 steel frame box cars from Canadian Car and Foundry Co

In Canadian Railway and Marine World for June, mention was made of an order having been placed by the Intercolonial Ry., for 180 steel underframe box cars, with the Eastern Car Co. This order was placed in February, and was mentioned in our March issue.

Following are the chief details of the 12 Otis all steel ore cars, which the Mond Nickel Co. has ordered from the Hart-Otis Car Co., and which will be built by Canadian Car and Foundry Co., as mentioned in our last issue:—

Capacity	100,000 lbs.
Length over end sills	21 ft. 0½ in.
Length inside	19 ft.
Width over all	9 ft. 11¼ ins.
Width inside	9 ft. 6 ins.
Height inside	4 ft. 6 ins.
Height from rail	8 ft. 10 3-16 ins.
Doors on each side	4

The Canadian Car and Foundry Co., during May, delivered rolling stock, completing original orders, which were as follows:—Montreal Harbor Commissioners. 15 all steel Otis cars, 50 tons capacity; C.P.R., 40 all steel Otis cars, 50 tons capacity, 6,000 steel frame box cars. 40 tons capacity; J. D. McArthur Co., 70 wood ballast cars, 40 tons capacity, F. H. Hopkins and Co., 2 Lidgerwood unloaders, 30 tons capacity; Montreal Tramways Co., 100 street car bodies and 125 pairs of trucks; Canadian Northern Ry., 10 wood colonist cars; and Intercolonial Ry., 500 steel frame box cars 30 tons capacity.

The Hudson's Bay Construction Co., Pas, Man., has received from the Hart-Otis Car Co., 70 of the latest type of Hart convertible ballast and construction cars, built by Canadian Car and Foundry Co. Following are the chief details:—

Length over end sills	36 ft. 8 ins.
Width over side sills	8 ft. 10 ins.
Length inside as hoppers	20 ft. 10 ins.
Length inside as gondolas	34 ft. 8 ins
Width inside	8 ft. 8 ins.
Width over all	10 ft. 2½ ins
Width at top	9 ft. 10 ins.
Height from rail to floor	4 ft. 4⅛ ins.
Height from rail to top of car	8 ft. 1⅜ ins.
Height inside	3 ft. 9¼ ins.
Truck centres	26 ft. 8 ins.
Wheel base of truck	5 ft. 4 ins.
Length of hopper door opening	16 ft. 8½ ins.
Width of hopper door opening	2 ft.

Following are chief details of the six wheeled saddle tank locomotive, built for burning oil fuel, which the Robt. McNair Shingle Co., Vancouver, B.C., has received from Canadian Locomotive Co.:—

Weight in working order	70,255 lbs.
Wheel base	8 ft.
Driving wheels, diar.	36 ins
Driving wheel centres	Cast iron
Driving journals	6 by 8 ins
Cylinders, diar. and stroke	13½ by 18 ins
Boiler, type	Straight top, radial stay
Boiler pressure	170 lbs.
Tubes, no. and diar.	103—2 ins
Tubes, length	10 ft.
Injectors	Ontario
Safety valves	Locomotive type
Brakes	Westinghouse automatic
Packing	Metallic
Capacity, water	1,500 U.S. galls.
Capacity, oil	300 U.S. galls.

Following are chief details of the six wheeled saddle tank locomotive which the Asbestos and Asbestic Co., Asbestos, Que. has received from the Canadian Locomotive Co.:—

Weight in working order	59,800 lbs.
Wheel base	8 ft.
Driving wheels, diar.	33 ins
Driving wheel centres	Cast iron
Driving journals	6 by 8 ins.
Cylinders, diar. and stroke	13 by 16 ins.
Boiler, type	Straight top, radial stay
Boiler pressure	160 lbs
Tubes, no. and diar.	103—2 ins
Tubes, length	9 ft. 2 ins.
Injectors	Ontario
Safety valves	Locomotive type
Brakes	Westinghouse automatic
Packing	Metallic
Capacity, water	700 imp. galls.
Capacity, coal	1,000 lbs.

Baldry, Yerburgh and Hutchinson, contractors for Sec. 2, Welland Ship Canal, St. Catharines, Ont., have ordered two six wheeled, saddle tank locomotives, from Canadian Locomotive Co., similar to one previously ordered, but with tenders applied. Following are chief details:—

Weight in working order	91,100 lbs
Wheel base	9 ft. 6 ins
Driving wheels, diar.	42 ins
Driving wheel centres	Cast iron
Driving journals	6½ by 8 ins.
Cylinders, diar. and stroke	15 by 22 ins.
Boiler, type	Straight top, radial stay
Boiler pressure	180 lbs.
Tubes, no. and diar.	138—2 ins.
Tubes, length	10 ft.
Injectors	Ontario
Safety valves	Locomotive type
Brakes	Westinghouse automatic
Packing	Metallic
Capacity, water	1,500 imp. galls.
Capacity, coal	3,000 lbs.

Following are details of the consolidation locomotives which the Intercolonial Ry. received recently from Canadian Locomotive Co., as mentioned in our last issue:—

Weight on drivers	208,000 lbs.
Weight, total	236,000 lbs.
Wheel base, engine, rigid	16 ft. 6 ins.
Wheel base, engine, total	25 ft. 5 ins.
Wheel base, engine and tender	69 ft. 11 ins.
Heating surface, firebox	207 sq. ft.
Heating surface tubes	1,885 sq. ft.
Heating surface, total	2,092 sq. ft
Driving wheels, diar.	63 ins.
Driving wheel centres	Cast steel
Driving journals	10 by 14 ins.
Cylinders, diar. and stroke	24 by 32 ins.
Boiler, type	Straight top, radial stay
Boiler pressure	180 lbs.
Tubes, no. and diar.	227—2 ins. 30—5⅜ ins.
Tubes, length	15 ft. 2¾ ins.
Injectors and safety valves	Locomotive type
Brakes	Westinghouse American
Packing	Metallic
Superheater	Schmidt A
Valve gear	Walschaert
Weight of tender, loaded	140,000 lbs.
Tank, type	Water bottom
Truck, type	Outside equalized
Wheels, diar.	34 ins.
Wheels, type	Steel tired, w.i. centres
Journals	5½ by 10 ins.
Brake beams	Steel I section
Capacity, water	6,500 imp. galls.
Capacity, coal	10 tons

Following are chief details of the seven mogul locomotives which J. D. McArthur Co., railway contractors, have received from the Canadian Locomotive Co. Six for Hudson Bay Ry. construction, and one for the Edmonton, Dunvegan and British Columbia Ry.:—

Weight on drivers	112,800 lbs.
Weight, total	129,500 lbs.
Wheel base of engine, rigid	12 ft. 6 ins.
Wheel base of engine, total	20 ft. 6½ ins.
Wheel base of engine and tender	49 ft. 3¾ ins.
Heating surface, firebox	133 sq.ft.
Heating surface, tubes	1,301 sq. ft.
Heating surface, total	1,434 sq. ft.
Driving wheels, diar.	50 ins.
Driving wheel centres	Cast iron
Driving journals	8½ by 12 ins.
Cylinders, diar. and stroke	19 by 26 ins.
Boiler, type	Extended wagon top
Boiler pressure	180 lbs.
Tubes, no. and diar.	240—2 ins.
Tubes, length	10 ft. 5¼ ins.
Injectors	Two, locomotive type
Safety valves	Two, 3 ins.
Brakes	Westinghouse
Packing	Metallic
Weight of tender, loaded	115,400 lbs.
Tank, type	U shape
Truck, type	4 wheel, arch bar
Wheels, diar.	33 ins.
Wheels, type	Steel tired
Journals	5 by 9 ins.
Brake beam	Steel
Capacity, water	5,000 imp. galls.
Capacity, coal	9 tons

Since the passing of the guarantee bill by the Dominion Parliament, the Canadian Northern management, which has not placed any rolling stock orders for some time past, has been considering what its requirements will be. About the middle of June D. B. Hanna, Third Vice President, summoned A. L. Graburn, Mechanical Engineer, back from Atlantic City, where he was attending the mechanical conventions, and also brought S. J. Hungerford Superintendent of Rolling Stock, from Winnipeg for consultation. The new Ottawa-Toronto line, on which a freight and a day passenger service is now being operated will be opened for through fast service to Ottawa before next session of Parliament and the line from north of Sudbury west to Port Arthur will also be put in operation for through service, to give direct connection to Edmonton and beyond. Plans and specifications are being prepared for a large amount of equipment, including passenger, parlor, cafe parlor, dining and sleeping cars, and it is possible that all steel construction will be decided on. Canadian Railway and Marine World is officially advised that when the orders are placed they will be for the last word in the way of passenger equipment.

Gradients on Grand Trunk Pacific Ry.—We have been furnished with the following official information:—The G.T.P.R. maximum gradient westbound is 0.5%; eastbound, 0.4%. There is on the Mountain Division 20.15 miles of 1% pusher grade against eastbound traffic, this occurring between miles 30 and 50, west of Yellowhead Pass. As this 1% is distinctly a pusher proposition and is planned for such, this company's maximum gradients are 0.5% against westbound and 0.4% against eastbound traffic. The maximum gradient both east and west from Wainwright to the Pacific Coast is 0.4%, with, of course, the 20 miles of pusher grade above referred to. Between Winnipeg and Wainwright the westbound gradient is 0.5% and 0.4% eastbound.

Curtis's & Harvey (Canada), Ltd., manufacturers of dynamite and other high explosives, Montreal, write: "Canadian Railway and Marine World is, without doubt, one of the best edited and printed papers in the country."

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have fyled our paper have a contiuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

21730. Apl. 29.—Authorizing C.N. Ontario Ry. to cross Silverthorne Ave., Toronto, by structure carrying highway over railway.

21731. May 1.—Authorizing G.T. Pacific Ry. to build ladder tracks across Kinistino Ave., Edmonton, Alta., and approving freight station there.

21732. May 1.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional right of way for transmission line in St. Ignace du Coteau du Lac Parish, Que.

21733. May 2.—Amending order 21480, Mar. 13, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) spur across C.N. Ontario Ry., at Trenton, Ont.

21734. May 2.—Ordering Great North Western Telegraph Co. to remove its wires and poles from Kent and certain other streets in Lindsay, Ont., and apportioning payment of cost of work.

21735. May 1.—Ordering Canadian Northern Ry. to erect fences along right of way on its Ottawa-Capreol Line through Field, Crerar, Badgerow and Gibbons Tps., Ont., within 60 days from date.

21736. May 1.—Authorizing C.P.R. to build spur for National Cash Register Co., York Tp., Ont.

21737. May 2.—Authorizing G.T.P. Branch Lines Co. to carry traffic over portion of its Young-Prince Albert Branch, Sask., between mileage 67 at Wakaw and mileage 87, speed of trains limited to 15 miles an hour.

21738. May 2.—Authorizing C.P.R. to rebuild bridge 5.3 near Priceville Station, Ont.

21739. May 2.—Authorizing Canadian Northern Ry. and C.P.R. to operate trains over crossing in Sec. 35-24-27, w. 4 m., Alta., without first stopping.

21740. May 4.—Amending order 21481, Mar. 13, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) spur across C.N. Ontario Ry., at Trenton, Ont.

21741. May 2.—Approving Lake Erie and Northern Ry.'s plan of overhead bridge at highway crossing between Cons. 2 and 3, Brantford Tp., Ont., mileage 16.92.

21742. May 2.—Authorizing Toronto, Hamilton and Buffalo Ry. and Hamilton St. Ry. to operate over crossing on Barton St., Hamilton, without first stopping.

21743. Apl. 20.—Approving Bell Telephone Co.'s agreement with Brighton Tp., Ont., of Mar. 31, for interchange of service.

21744. May 2.—Authorizing G.T. Pacific Ry. to build across and divert highway in Lot 935, Cariboo Dist., B.C., mileage 232.3, Yellowhead Pass west.

21745. May 2.—Ordering that classification of maple butter be made the same as peanut butter, the change to be included in Supplement 3 to Canadian Freight Classification 16.

21746. May 4.—Disallowing supplement 146 to G.T.R. Special Tariff, C.R.C. no. E-2552, increasing rate on clay, in carloads, from Waterdown to Swansea and Mimico, Ont., from 1½c. to 2c. per 100 lbs., and restoring rate of 1½c. per 100 lbs.

21747. May 4.—Authorizing Cedar Rapids Mfg. and Power Co., Montreal, to take additional land for right of way for transmission line, St. Joseph de Soulanges Parish, Que.

21748. May 2.—Authorizing Usborne rural municipality, no. 310, Sask., to build crossing over C.P.R. Pheasant Hills Branch at west boundary of s.e. ¼ sec. 34-33-23, w. 2 m., Sask., and rescinding order 21452, Mar 9, 1914, in same connection.

21749. Apl. 27.—Authorizing Cedar Rapids Mfg. & Power Co., Montreal, to take additional 24.8 ft. for transmission line across east half, Lot 31, Con. 1, Lancaster Tp., Ont.

21750. May 1.—Appointing P. H. Drayton, K.C., as arbitrator to enquire into damages, if any, sustained by Heward Estate in connection with C.P.R. spur in Toronto, and fix compensation therefor.

21751. Apl. 29.—Ordering C.P.R. and Ottawa and New York Ry., by June 1, to schedule trains 30 and 305, C.P.R., and 20, O. & N.Y.R., at Finch, Ont., at 9.52 a.m., and carry out certain directions and rescinding order 19625, May 13, 1913, in same connection.

21752. May 2.—Authorizing clearances as shown on C.P.R. plan re Rogers Pass Tunnell.

21753. May 2.—Relieving G.T.R. from providing further protection at crossing of first highway west of Stoney Creek, Ont.

21754. May 4.—Approving revised location G.T. Pacific Branch Lines Co., Moose Jaw Northwest Branch from mileage 73.34 to 77.98, Sask.

21755. May 4.—Authorizing C.P.R. to build bridge 18.1, Moose Jaw Subdivision, Sask.

21756. May 4.—Authorizing C.P.R. to divert old trail to Medicine Hat and build its Swift Current Northesterly Branch across same in Sec. 36-22-29, w. 3 m., Sask.

21757. May 4.—Ordering C.P.R. within 90 days to install improved type of automatic bell at crossing of first highway east of Central Ontario Jct., 20% of cost to be paid out of the railway grade crossing fund.

21758. May 6.—Approving revised location of C.P.R. Swift Current Northwesterly Branch from mileage 0, northwesterly to mileage 10.82.

21759. May 5.—Authorizing C.P.R. to build siding, at grade, across public road between City of Guelph and Guelph Tp., at mileage 30.33, Hamilton and Goderich Subdivision, Ont.

21760. May 6.—Authorizing Dominion Atlantic Ry. to rebuild bridge over Bear River, Digby County, N.S., and approving plan B-1-1261, marked A, showing location of proposed temporary lift span in old bridge.

21761. May 5.—Authorizing C.P.R. to build spur for Builders' Supply Co., Winnipeg, Man.

21762. May 5.—Authorizing C.P.R. to take certain lands in Ottawa, Ont., for enlarging its Sussex St. terminals.

21763. May 6.—Authorizing C.P.R. to change location of spur for Security Lumber Co., Moose Jaw, Sask.

21764. May 6.—Approving location and details of C.N. Quebec Ry. station at Lac aux Sables.

21765. May 6.—Approving Supplement 4 to Express Classification for Canada, 3, containing changes respecting moving picture films, organs, pianos and pianoplayers.

21766. May 6.—Authorizing Toronto, Hamilton and Buffalo Ry. to divert highway between Lots 21 and 22, Con. 5, Gainsboro Tp., Ont., and authorizing it to acquire a 66 ft. parcel of land connecting that highway with highway between Cons. 5 and 6, and to convey to Gainsboro Tp. said land for highway purposes, in lieu of another parcel.

21767. May 5.—Authorizing Toronto, Hamilton and Buffalo Ry. to install automatic block signals between Welland and Hamilton, Ont.; approving plans of said signals, and rescinding orders 14066 and 15974, June 24th, 1911, and Feb. 14th, 1912, respectively.

21768. May 6.—Authorizing C.P.R. to build spur for Pilkington Bros., Calgary, Alta.

21769. May 6.—Authorizing C.P.R. to open for traffic its double track from mileage 109.4 to 110.5, Swift Current Subdivision, Sask.

21770. May 6.—Authorizing C.P.R. to take certain lands in Peterboro, Ont., for providing team road to its freight yard.

21771. May 6.—Authorizing C.P.R. to build extension to siding for William Neilson, Ltd., in Beachville, Ont.

21772. May 7.—Authorizing C.P.R. to open for traffic portions of double track on its Bergen Northeasterly Line, from mileage 0 to 9.92; Emerson Subdivision, mileage 0 to 2.03; and Lac du Bonnet Subdivision, from Whittier to Murdock, mileage 65.1 to 62.2, Man.

21773. May 6.—Authorizing C.P.R. to build spur for F. Sask. & Co. and The Constructors, Ltd., Regina, Sask.

21774. May 7.—Approving plan X-2-317|6, Apr. 7, showing interlocking plant to be installed at crossing of C.P.R. Owen Sound section by G.T.R., at Weston Road, Toronto.

21775. May 7.—Authorizing C.P.R. to build spur for Brunelle and Besner, Vaudreuil, Que.

21776. May 7.—Authorizing C.P.R. to build spur for Canadian Sewer Pipe and Clay Product Co., Hamilton, Ont.

21777. May 2.—Approving contract between Byron Telephone Co. and Bell Telephone Co. of Canada.

21778. May 7.—Ordering that crossing of Berlin and Northern Ry. by G.T.R. on Wellington St., Berlin, Ont., be protected by half interlocking plant, derails on G.T.R. and semaphores on B. & N. R., each 100 ft. from diamond; G.T.R. to pay whole cost.

21779. May 7.—Ordering C.P.R. to build highway crossing at Pine St., Sault Ste. Marie, Ont.

21780. May 7.—Ordering that crossing of G.T.R. by Berlin and Northern Ry., at Bridgeport St., Berlin, Ont., be protected by half interlocker, derails on B. and N. R. to be 100 ft. from diamond, semaphores on G.T.R. to be 300 ft. from diamond; B. and N. R. to pay whole cost.

21781. May 7.—Reducing joint commodity rates of Chatham, Wallaceburg and Lake Erie Ry. and Pere Marquette Rd., in connection with G.T.R. and C.P.R., for carriage of sugar, in carloads, from Wallaceburg, Ont., to Hamilton and Toronto, to 10½c. per 100 lbs. and 11½c. per 100 lbs., respectively, on minimum of 40,000 lbs. per carload; effective by May 25.

21782. May 6.—Authorizing C.P.R. to build extension to spur for Francis Hankin and Co., and Canada Sand and Concrete Co., St. Charles Borromee Parish, Que.

21783. May 7.—Extending, to July 1, time within which G.T.R. shall submit for approval location of new station at Summerstown, Ont.; work to be completed by Nov. 1st; and ordering G.T.R. forthwith to remove certain telegraph poles and to provide 4 wheel truck to carry milk and cream to movable platform on south side of present platform.

21784. May 8.—Amending order 21728, April 29, re farm crossing over G.T.R. and C.P.R., Pointe Claire Parish, Que.

21785. May 8.—Authorizing C.P.R. to operate over portion of its Weyburn Westerly Branch from Woodrow to Shaunavon, mileage 145.7 to 230.8, at speed not exceeding 25 miles an hour, instead of 18 and 10 miles as provided in order 21227.

21786. May 8.—Disallowing tariffs and supplements applicable to international traffic filed by G.T.R., Michigan Central Rd., Wabash Rd., C.P.R., and Pere Marquette.

21787. May 8.—Authorizing G.T.R. to operate over 25 bridges on District 15, Ont.

21788. Apr. 29.—Ordering Canadian Northern Ry. to build a road north of its tracks, connecting road allowance between Secs. 5 and 8-18-21, with some street in Elphinstone, Man., work to be completed by June 15; 20% of cost to be paid out of the railway grade crossing fund.

21789. May 12.—Suspending provisions of order 21621, Apr. 9, re increased rates on lumber as shown in Supplement 51 to G.T.R. tariff C.R.C. no. E.2318; C.P.R. tariff C.R.C. no. E.2779 and C.N.R. tariff C.R.C. no. E.419, in respect of stations between Montreal and Ottawa, and Montreal and Hull, including Point Fortune, Hawkesbury, and Rockland branches; also between Hull and Waltham, Hull and Maniwaki, and Ottawa and Pembroke, and reinstating rates charged during 1913, effective one week from date, and dismissing complaint against increased rates to Montreal for local delivery.

21790. May 11.—Authorizing C.P.R. to use bridges 133.28 and 102.55, Algoma Subdivision, Lake Superior Division, Ont.

21791. May 12.—Approving clearance between C.P.R. standard coal sheds and side tracks, and rescinding order 21446, March 5.

21792. Apr. 30.—Amending order 21281, Feb. 7, 1914, re crossings over G.T.R. adjoining Front St., Toronto.

21793. May 13.—Authorizing Canadian Northern Ry. to build across and divert highways between Secs. 20 and 29-38-26 and Secs. 29 and 30-38-26, w. 2 m., near Dana, Sask.

21794. May 13.—Authorizing C.N. Ontario Ry. to divert Symes Road in Lot 37, Con. 3, York Tp., and carry same under railway by a subway; clear head room 14 ft. and clear width 20 ft.; grade on north approach to be changed to 5%.

21795. May 12.—Approving location of C.P.R. station at Larchwood, Lot 11, Con. 3, Balfour Tp., Ont., mileage 96.25, Cartier Subdivision, Ont.

21796. May 13.—Authorizing C.P.R. to build road diversion in Sec. 1-15-14, w. 3 m., Sask.; and to build its Swift Current Southeasterly Branch across same at mileage 4.78, without prejudice to Saskatchewan Government's right to apply at any future time for separation of grades there.

21797. May 13.—Authorizing C.P.R. to build through siding at grade across Inches Ave. and La Croix St., Chatham, at mileage 64.86, Windsor Subdivision, Ont.

21798. May 13.—Authorizing C.P.R. to rebuild bridge 103.25 near Auburn station, Ont.

21799. May 14.—Extending to Aug. 15 time within which C.P.R. shall complete subway at Dundas St., Woodstock, Ont.

21800, 21801. May 14.—Approving revised location of C.P.R. main line as built, and of double track from mileage 51.49, Schreiber Subdivision, to mileage 54.37, in Lot 11, R. 6, Pic Tp., and from mileage 10 to mileage 14, in Mining Location 85 Z, Tp. 86, Thunder Bay District, Nipigon Subdivision, Ont.

21802. May 13.—Approving Bell Telephone Co.'s agreement with Pontiac Rural Telephone Co., April 3, for interchange of business.

21803. May 14.—Approving location of C.P.R. station at Ringold, mileage 70.99, Windsor Subdivision, Ont.

21804 to 21806. May 14.—Authorizing C.P.R. to build spurs for G. White & Sons Co., Moose Jaw, Sask.; Mond Nickel Co., Coniston, Ont., and T. Fletcher, Calgary, Alta.

21807. May 14.—Relieving Canadian Northern Ry. from speed limitation of 18 miles an hour from Oak Point to Gypsumville, Man., 97 miles; and ordering that fencing from mileage 69 be completed by Oct. 1st.

21808. May 15.—Authorizing C.N. Ontario Ry. to build bridge over Raimbault Creek, St. Laurent Parish, Que., mileage 48.07 from Hawkesbury; and rescinding orders 19657 and 21650, June 21, 1913, and Apr. 15 respectively.

21809. May 11.—Approving G.T. Pacific Ry. plans of stresses of superstructure and details of substructure of bridge across Nechaco River, mileage 371.4 Prince Rupert Easterly, B.C.

Electric Railway Department

The Postmaster-General and the Transportation of Postmen.

On Feb. 21, 1913, the Postmaster General introduced, and secured the first reading in the House of Commons, of a bill of three clauses, to provide that postmen be conveyed on every electric railway in Canada on such terms and conditions and under such regulations as might be made by the P.M.G., and that if any electric railway company refused to carry postmen at the amount fixed by the P.M.G., the company should refund an amount equal to the difference between the amount so fixed and the amount actually expended for such carriage, and the act was to be made retroactive from March 1, 1913. A deputation from the Canadian Electric Railway Association waited on the P.M.G. as quickly as possible, protesting most strongly against the arbitrary nature of the bill, and the Premier was also waited on, and towards the end of the session the bill was withdrawn. At the interview referred to with the P.M.G., it was suggested, on behalf of the electric railway companies, that in case of dispute between the P.M.G. and any company, the matter be referred to the Board of Railway Commissioners, but Mr. Pelletier declined to accept this suggestion.

At the session of Parliament which closed recently, the P.M.G. introduced a bill, entitled, "An Act to Amend the Post Office Act," dealing with a number of matters, including postage on newspapers, etc., registration and insurance letters, and appointments and salaries of railway mail clerks, and towards the end of the bill the first two sections of the 1913 bill in regard to transportation of postmen were included, with the exception that the words "except municipally owned electric railways" were inserted, thus exempting municipally owned lines and dealing only with electric railways owned by companies. This bill was carried through the Commons without the interests affected having any notice of it, and it was not distributed to the press or public until after it had received its third reading on May 4.

Steps were then immediately taken by the Canadian Electric Railway Association's Secretary-Treasurer to secure a delay of the bill in the Senate until representations could be made against it. Its provisions were fully discussed at the Association's annual meeting i nOttawa, May 13 and 14. On the following day the Association's then retiring President, Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co., and the Association's Secretary-Treasurer, Acton Burrows, remained in Ottawa in connection with the matter. Owing to the representations made, the bill was further delayed from time to time in the Senate. The Government leader there, Senator Lougheed, proposed to have it referred to a committee of the whole house after its second reading, but as this would have prevented the Association from being heard, Senator Young moved that it be referred to the Committee on Banking and Commerce, which was carried, and its consideration fixed for May 27. Mr. Burrows attended at Ottawa on that day, but the committee's whole session was taken up in considering the first section of the bill, relating to the rates of newspaper postage, and the commlttee adjourned till May 29, when Mr. Burrows returned to Ottawa and was given an opportunity of addressing the commlttee and stating the Association's case. A full report of his remarks, which, at the suggestion of one of the members of the committee, was immediately printed and distributed to all the senators, is given on page 333 of this issue. He was followed by Andrew T. Thompson, Ottawa solicitor of the British Columbia Electric Ry. Co., and T. Rinfret, of the Montreal Tramways Co.'s solicitors' office. The P.M.G., who adopted the unusual practice of a minister with a seat in the Commons, appearing before a Senate committee to urge the passing of a bill, spoke in reply, and Mr. Burrows was allowed to speak again in rebuttal of some statements Mr. Pelletier made. When 1 p.m. had been reached, further consideration of the bill was adjourned to June 1, when the P.M.G. appeared before the committee with the following suggestion for an amendment to the bill:—

"If any electric railway objects to such terms and conditions within eight days after it has been duly notified of same, the Postmaster General will, by petition duly served, apply to the Board of Railway Commissioners, which is hereby empowered to order any electric railways to accept such terms and conditions if it is found that they are on the whole about the same as those now in force, and to vary them only if there are special circumstances which might justify a different decision in any special case. The same rule will apply in case any terms and conditions now prevailing are to be revised by the Postmaster General."

Mr. Burrows protested most vigorously against the proposed amendment, pointing out that its adoption would effectually tie the Board of Railway Commissioners' hands and that it was absolutely foreign to the principles of arbitration. As it was evident that a majority of the committee was against the proposed amendment, the P.M.G. evidently thought it best not to press it any further, and Senator Lougheed, on behalf of the Government, then introduced the following amendment:—

electric railways, or any of them, and the Department, the terms and conditions shall be fixed by the Board of Railway Commissioners for Canada, and in so doing due regard shall be had by the Board to terms and conditions agreed upon theretofore between the said electric railways, or any of them, and the Department."

Senator Lougheed also moved to strike out sec. 9 of the bill requiring electric railway companies to refund any amounts charged for fares in excess of rates fixed by the P. M. G. As the first part of Mr. Lougheed's amendment was in accordance with the action taken on behalf of the Association on Feb. 28, 1913, when it was suggested to the P.M.G. that in case of dispute as to compensation to be paid, the matter be referred to the Board of Railway Commissioners, a suggestion which he then referred to the Board of Railway Commissioners, a suggestion which he then refused to entertain, Mr. Burrows did not oppose the amendment, but suggested that the following words be omitted, "and in so doing due regard shall be had by the Board to terms and conditions agreed upon theretofore between the said electric railways or any of them and the Department." This, however, Mr. Lougheed would not agree to. Senator Mitchell then moved that secs. 8 and 9 of the bill be struck out altogether. Mr. Lougheed's amendment was finally adopted by a vote of 10 to 9.

In view of the fact that the bill was a Government measure and that it had been passed by the House of Commons without a division, it could hardly be expected to secure its entire rejection, and the result was considered very satisfactory, the Government having practically accepted the Association's contention of last year, and the proposal to clothe the P. M. G. with arbitrary power without any right to appeal having been rejected.

The Senate's Commlttee on Banking and Commerce also made an amendment to the clause of the bill relating to newspaper postage which the Commons, at the P. M. G.'s instigation, refused to agree to. When the bill again came up in the Senate on June 10, Mr. Burrows, who was also interested in the newspaper postage question, had returned to Ottawa, and in conjunction with other publishers, made such representations that the Senate, by a vote of 28 to 13, refused to give the P. M. G. the power to decide the rates of postage to be paid on newspapers, a power which has been vested in Parliament ever since Federation and which he attempted to take away from that body and give to himself. The bill in its amended form went back to the Commons once more, and as the P. M. G. would not consent to the Senate's amendment to make newspaper rates subject to parliamentary approval, the bill was dropped.

The net result, therefore, is that matters are in exactly the same position as they were before the bill was introduced, and that the compensation to be paid for the transportation of postmen is still a question to be settled by negotiations between the Postmaster General and the different electric railway companies.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT — James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY-TREASURER—Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE — The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY—Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

Acton Burrows on Compensation for Carrying Postmen on Electric Railways.

Acton Burrows appeared before the Senate Committee on Banking and Commerce, in Ottawa, May 29, and made the following remarks:

Honorable Gentlemen:—The day before yesterday and today are the first occasions on which I have had the honor of appearing before a parliamentary committee, and I respectfully crave your indulgence, as. although not young in years, I am young in experience of this nature. Allow me to explain that I am the publisher of a technical paper, the Canadian Railway and Marine World, and am also Honorary Secretary-Treasurer of the Canadian Electric Railway Association, composed of 90 per cent. of the principal electric railway companies from Cape Breton to Vancouver.

The object of this association is, as set out in its constitution, the acquisition of experimental, statistical and scientific knowledge relating to the construction, equipment and operation of electric railways, and the diffusion of this knowledge among the members of the Association, with the view of increasing the accommodation of passengers, improving the service, and reducing its cost, and the encouragement of cordial and friendly relations between the roads and the public.

The sections of this bill to which we take exception are numbers 8 and 9, which read as follows:—

"8. Letter carriers in the service of the Post Office Department shall be conveyed on every electric railway in Canada, except municipally owned electric railways, on such terms and conditions, and under such regulations, as are made by the Postmaster General.

"9. If any company operating such electric railway refuses to carry any such letter carrier at the amount so fixed by the Postmaster General, the company shall refund an amount equal to the difference between the amount so fixed and the amount actually expended for such carriage."

The companies affected by these sections had no notice of the introduction of the bill in the Commons, and no chance to be heard before any committee of that House. The first we heard of it was a report in the daily press that it had passed its third reading, so that this is the first opportunity we have had of expressing our views. The bill was not distributed to the public until after it had been read a third time, and the first copy of it which reached me came in the same package as the Commons Debates of May 4, which contained the discussion on the third reading.

Against the provision that electric railways, other than those municipally owned, shall carry postmen at whatever rate the Postmaster General of the day may decide, we respectfully enter a most emphatic protest. As a matter of right, the Dominion Government has no claim on electric railway companies for the performance of any service on exceptional terms.

Parliament has empowered the Governor in Council, not the Postmaster General, (See R. S. 1906, chap. 66, sec. 115) to fix the rates to be paid the railways for the transportation of mails. These mails are carried almost entirely by steam railways, which have received Dominion subsidies in aid of construction. Personally I do not think this power should be vested even in the Governor in Council, but that the matter should be dealt with by a body such as the Board of Railway Commissioners. On the other hand, it can be argued that the steam railways have been subsidized and that, therefore, they should perform certain duties for the Government on exceptional terms. But with electric railways the position is entirely different. Not one of them, urban or interurban, has received any subsidy from the Dominion, with the single exception of the Oshawa Railway, in Ontario, which was originally promoted as a steam railway and was voted a subsidy in aid of construction, but was subsequently built as an electric line.

We submit that there is no reason why postmen should be carried at any less rate than any other passengers. As a matter of fact, with their bags of mail matter, they take up more room and weigh more than ordinary passengers. There is no reason why they should not be supplied by the Post Office Department with tickets bought at the ordinary rate.

But the electric railway companies were willing to be reasonable with the Department, and to save it trouble, and with this end in view, some years ago, a number of the companies entered into contracts to transport postmen at a lump sum per man per year. The electric railway industry was then almost in its infancy. The lines had not been in operation a sufficient time to enable accurate cost data to be worked out, but when this was done it was found that some of the contracts had been taken at ridiculously low rates, and that the companies were actually losing money on them. In 1909 the Canadian Electric Railway Association conducted an investigation, and as a result, came to the conclusion that it did not pay to carry postmen at less than $50 each per year, which, of course, works out at less than $1 per week, and that in the larger cities, with wide areas and long distances of travel, the rates should be higher.

The rates asked of recent years by the electric railways are not necessarily excessive because they are higher than those originally accepted. The companies would be perfectly justified in asking that the lump sum per postman per year should be as much as would be paid if they were supplied with tickets at ordinary rates. Since the first contracts were made with the Department, the expenses of conducting street railway transportation have vastly increased, particularly wages, and all construction work, rolling stock, and other supplies have largely advanced in price. As a result, the cost of transportation per passenger is considerably higher than it was a few years ago.

In the United States a straight 5 cent cash fare is almost universal, and the necessity for higher fares in Canada is illustrated by the cases of several of the municipally owned lines in the northwest, for example Edmonton, which has recently advanced its rate to 5 cents, except for limited tickets during certain hours. Saskatoon is following suit, and in Lethbridge and Brandon it has been necessary to adopt one-man cars, that is, to have one man act as both motorman and conductor in order to make ends meet.

Last year the Postmaster General introduced a bill of three sections, practically the same as sections 8, 9 and 10 of the present bill, but without the words "except municipally owned electric railways," which made it apply to all electric railways. We had an interview with the Postmaster General, and other members of the Government were subsequently called upon, and the bill was withdrawn.

We asked the Postmaster General for a conference between himself and his officers and representatives of our Association, but we have not been accorded this, and the withdrawn bill of last year has been again brought in as part of a general bill, but with the municipally owned electric railways excepted. I have no hesitation in saying that the true reason why municipally owned railways have been excepted is because the Union of Canadian Municipalities took strong exception to last session's bill, and had they been included this year, similar opposition would have again been offered by the municipalities interested. The managements of many of the municipally owned lines are far from satisfied with the rates they have been getting, and I know that in several cases they want more.

It has been charged by the Postmaster General that some electric railways have been extortionate and have attempted to hold up the Department. We take emphatic exception to that statement.

The companies have also been charged with having no consideration for the postman. This is equally foundationless. It is the duty of the Department, not of the electric railways, to provide for carrying postmen and to give them every facility for making speedy delivery of letters. This is recognized by the provision in the Post Office Act (R.S., 1906, sec. 73, ss. 2), which reads as follows:—"In places enjoying the free letter carrier delivery system, the Postmaster General, in lieu of paying street railway companies for the transportation of letter carriers, may pay to any carrier, to defray his cost of transportation, a bulk sum not exceeding $50 a year, but this provision shall not apply to places where carriers are entitled to free street railway transportation."

The Postmaster General is thus given the power to allow postmen up to $50 a year to pay their transportation on electric railways, yet when electric railways ask that figure, he accuses them of being extortionate, etc. We challenge the fullest investigation of the whole question, which would undoubtedly show that the electric railway companies have been most reasonable in their demands.

Last year, in an interview with the Postmaster General, we said "We are so sure of the reasonableness of our case that we are willing to leave the matter in the hands of the Board of Railway Commissioners, a body appointed by the Government." The Postmaster General replied, "No, I will not agree to that, as the Board would probably decide according to the value of the service." In other words, that he is not prepared to pay what the service is fairly worth. It is therefore evident that the Postmaster General has not an open mind on the question, and we object to the rate of compensation being left to him, or to any other one person.

If the Postmaster General is to be given the power to say what shall be paid for carrying postmen, why should he not be given similar arbitrary power to compel manufacturers to make letter boxes for the streets, the mail bags the locks for the boxes, the postmen's uniforms, and everything else the Department requires, at any rates he may determine?

The Postmaster General is not willing to accord to electric railways even the same rights as ferrymen have, namely arbitration. The Post Office Act (R.S., 1906, chap. 66, sec. 88) provides as follows: "Every ferryman shall, upon request, and without delay, convey over his ferry any courier or other person travelling with the mail, and the carriage and horse or horses employed in carrying the same; and the sum to be paid for such service may be fixed by contract; or if any ferryman demands more than the post office authorities or the contractor for carrying the mail are willing to pay, the amount to be paid shall be fixed by arbitrators, each party naming an arbitrator, and the two arbitrators naming a third; and the decision of any two of such arbitrators shall be

binding." Yet while a ferryman has the right of being protected by arbitration the Postmaster General is not willing that electric railways should have such a right, but wishes to have them accept whatever he may determine.

One of the most important objections to this bill I have left to the last. A large majority of the electric railway companies throughout Canada were chartered by provincial legislatures, not by the Dominion Parliament. I submit that this Parliament cannot enact laws to govern the provincially chartered companies.

When this bill was under discussion in the Commons, the honorable member for Moose Jaw said: "Take the Moose Jaw or Toronto street railway companies, incorporated by provincial legislatures. Their rates are subject to whatever bodies the legislature may create in the shape of a provincial railway commission. I very much question if this house has power to say to a provincially created company, 'You will carry people at a certain price,' we might as well say we have power to compel a 3 cent rate in Toronto."

And in the Senate on May 19, the Hon. Mr. Casgrain said: "I want to draw the attention of the Government to the fact that the ipse dixit of the Postmaster General would regulate the fares to be charged on electric railways, which are not under the jurisdiction of this Parliament—for instance, provincial railways. Now, we have utilities commissions in some Provinces to regulate that very point. There should be some sort of appeal, so that if there was no agreement between the companies and the Postmaster General, surely it would be right to amend this clause by letting it go to the Railway Board or other body."

The Postmaster General says the Department of Justice has given an opinion that the bill is intra vires. But the Department of Justice is not incapable of erring. Some opinions that it has given have failed to be upheld by the courts. On the other side, we have the opinions of several counsel, including Mr. H. A. Lovett, K.C., who is recognized as one of the ablest authorities in Canada. In a lengthy opinion which he has given, he says: "In my opinion a statute of Canada attempting to compel a provincial railway to transport letter carriers free of charge, or for an arbitrary sum to be fixed by the Parliament of Canada, or by some official appointed under the act, would be ultra vires of the legislative jurisdiction of that Parliament."

Should sections 8 and 9 pass, and any Postmaster General attempt to act under them, the provincially chartered companies, at least, would undoubtedly test the validity of the act, and another struggle for provincial rights would be precipitated.

In conclusion, we respectfully ask you not to approve of sections 8 and 9, because:

1. There is no necessity for their enactment.
2. Such arbitrary powers should not be given to any one man.
3. Their enactment would practically establish a bureaucracy, with the Postmaster General of the day as the chief bureaucrat.
4. They are altogether of too arbitrary a nature for enactment in a democratic country.
5. They are ultra vires in regard to provincially chartered electric railways.

Walter Carey, of the Canadian Northern Ontario Ry. engineering staff, Pembroke, Ont., writes: "I have read your circular with regard to the increase in Canadian Railway and Marine World subscription rates and may say that I have wondered how you could sell such a strictly first class publication for so small a price."

Personal Paragraphs.

Mrs. McLean, wife of H. H. McLEAN, K.C., M.P., President, St. John Ry., died at St. John, N.B., June 11.

R. M. HANNAFORD, Assistant Chief Engineer, Montreal Tramways Co., has been

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George Kidd,
General Manager, British Columbia Electric Railway.

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D. W. Houston,
Superintendent, Regina Municipal Railway.

elected Second Vice President, Canadian Railway Club.

T. AHEARN, President, Ottawa Electric Ry., was one of the stewards at the spring meeting of the Connaught Park Jockey Club, during June.

C. JOHNS, electrician, St. Thomas St. Ry., has resigned, as the committee desired to remove him from the street railway department to the hydro electric department.

Miss Todd, only daughter of MARTIN N. TODD, President, Galt, Preston and Hespeler Street Railway, was married to A. H. T. Basett, of Edmonton, Alta., at Galt, recently.

W. T. WOODROOFE, who recently resigned as Superintendent, Edmonton Radial Ry., Edmonton, Alta., and who was formerly in British Columbia Electric Ry. service, is preparing a report on electrolysis conditions in Vancouver for the city.

In Canadian Railway and Marine World for June, under "Birthdays of Transportation Men," the date of birth of ALLAN PURVIS, Manager Interurban Lines, British Columbia Electric Ry., New Westminster, B.C., was given as June 29, 1864, instead of June 29, 1878.

GEORGE KIDD, whose appointment as General Manager, British Columbia Electric Ry., Vancouver, was announced in our last issue, and whose portrait appears in this issue, entered B. C. Electric Ry. service in Jan., 1908, since when he has been, to Mar., 1911, Secretary of the company, London, Eng.; Mar. 1911, to May 6, 1914, Comptroller and assistant to General Manager, Vancouver.

DAVID W. HOUSTON, whose appointment as Superintendent, Regina Municipal Ry., Regina, Sask., was mentioned in a previous issue, and whose portrait appears in this issue, was born at Bathurst, N.B., Jan. 3, 1879, and entered transportation service in July, 1899, since when he has been, to 1902, clerk, Chicago, Burlington and Quincy Ry., Omaha, Neb.; 1902 to 1907, student, School of Mining, Queen's University, Kingston, Ont., graduating therefrom with the degree of B.Sc.; during the vacations he occupied various mining and engineering positions; May to Oct., 1907, Inspector of Mining Claims, Ontario Government, Montreal River District; 1908 to 1913, Auditor and acting Manager, Tabor and Northern Ry., Tabor, Ia.; July 13, 1913, to Mar 12, 1914, Assistant Superintendent, Regina Municipal Ry., Regina, Sask.; Mar. 12, to Apr. 30, acting Superintendent in charge of operation, same railway; May 1 to May 12, 1914, acting Superintendent, same railway.

Increase of Fares on Edmonton Radial Railway.

It became necessary recently to advance fares on the Edmonton Radial Ry., which is owned by the city of Edmonton, Alberta, in connection with which we have been furnished with the following information:—The city council has authorized the adoption of a 5c. cash fare for adults, with unlimited tickets for adults at 5 for 25c. Limited tickets for adults are sold at 8 for 25c., good only between 5 and 8 a.m. on week days. Children's tickets are sold at 12 for 25c., good at all times. In adopting the 5c. cash fare it was felt that it would be an advantage to continue selling tickets, and this has already been proved correct by the fact that large numbers of tickets are being sold at 5 for 25c. Selling tickets assists the conductors, as if none were sold they would have to carry a large amount of change and it would take up a good deal of their time making change for passengers. Good financial results are being expected from the increase in fares and the change will be watched with much interest.

The first p.a.y.e. cars were put into service on the Winnipeg Electric Ry., May 27.

Electric Railway Projects, Construction, Betterments, Etc.

British Columbia Electric Ry.—The Vancouver City Council has granted a permit for the erection of the new double deck car barn at Fourteenth Ave. and Main St., to Westinghouse, Church, Kerr and Co. The estimated cost of the work is $300,000. A description of this building was given in Canadian Railway and Marine World for Nov., 1913. pg. 542.

Work is in progress on the extensions on Commercial Drive, Fourth Ave., and Main St., Vancouver.

A contract is reported let to M. J. Coughlan and Sons, for the substructure of a steel bridge across False Creek at Kitsilano, on the Eburne line, to replace the present wooden trestle.

It is reported that material is being assembled for the extension of the line from Burnside Road to Harriet Road, Victoria.

Application is being made to the Victoria City Council for permission to lay a second track on Esquimalt Road, between Dundas and Catherine streets. The company proposes to lay a second track on the entire line from Point Ellice bridge to the terminal. There is a narrow place on the road in the section referred to, and the City Engineer will investigate the matter and report.

In connection with the agreement made under which freight will be exchanged at Sumas, with the Chicago, Milwaukee and Puget Sound Ry., it is reported that the connecting line for the interchange of traffic will be about three miles long, and that it will run from near Sumas, connecting with the B. C. E. Ry. at Huntingdon, B. C., and will be built by the C., M. and P. S. Ry. (June, pg. 283.)

Cape Breton Electric Co.—We are officially advised that the company has a franchise for the building of extensions of its lines to New Waterford and Florence, N. S. The supplementary agreement recently made was to clear up a point in the original document as to the date on which the agreement came into effect in regard to the extension to New Waterford. There is nothing new in the way of arranging for construction. The company has applied to the Lieutenant Governor in Council for the necessary approval of the rates of fare and schedules proposed to apply to the extension. It is expected that construction will be started in accordance with the agreement. E. L. Milliken, Sydney, N. S., is Manager. (June, pg. 283.)

Edmonton Interurban Ry.—B. J. Arnold, Chicago, Ill., was in Edmonton, Alta., at the end of May, looking over the company's property, and the territory to be operated by its various projected lines, with a view of, a press reporter says, advising as to possible extensions of the line, and as to the most economical means of securing power for its operation. The line from Edmonton to St. Albert, we were advised in February, was being operated by a gasoline motor car. The press reports quoted stated that until Mr. Arnold's report was received and considered, nothing could be done in the way of operating the line. This statement would suggest that the gasoline car has not proved satisfactory, and that another motive power is to be considered. The first extension project which the company proposes to consider, the report adds, will be from the present terminus at St. Albert to Fort Saskatchewan, but we were officially advised, April 27, that the company was not contemplating such an extension. (May, pg. 231.)

Edmonton Radial Ry.—$15,573.34 has been set aside by the Edmonton, Alta., City Council, for a site for a car barn, out of the money authorized to be raised under the recent bylaws. (June, pg. 283.)

Fort William Electric Ry.—The Fort William, Ont., City Council has let a contract for four diamonds to Canadian Steel Foundries, and for a fifth in the U. S. These are for use on extensions of lines. (May, pg. 231.)

Hamilton St. Ry.—Relaying the tracks on King St. east, between James and Catharine streets, is practically completed. (June, pg. 283.)

International Suburban Ry.—The application for the incorporation of a company with this title to build an electric railway near Windsor, Ont., with a ferry or tunnel connection with Detroit, Mich., was withdrawn from Parliament, June 4. (June, pg. 282.)

Kingston, Portsmouth and Cataraqui Electric Ry.—Work was started on putting in the foundation for relaying the tracks on King St., Kingston, Ont., May 25, and the entire work is reported to have been completed. It is also reported that the laying of a second track on Barrie and Alfred Streets has been finished. (June, pg. 283.)

The relaying of the tracks on Princess St. is completed, and service was started over the new tracks, June 17.

Lacombe and Blindman Valley Electric Ry.—We are officially advised that the general route of the line will be from Lacombe, Alta., westerly to the south end of Gull Lake, approximately 11 miles, then west to Bentley, 8 miles, thence following the Blindman River Valley to Rimbey, 14 miles. The line will be built on a private right of way; with a gradient 1% compensated, and a maximum curvature of 6 degrees. Corrugated iron and cedar box culverts will be used. A wooden trestle 700 ft. long and 60 ft. high will be built across the Outlet Creek running from Gull Lake into the Blindman River. The track will be built with 60 lbs. steel rails, G. T. Pacific Ry. specifications. The system of telephone has not been decided. Farncomb and Inkster, Edmonton South, Alta., are the engineers. (May, pg. 231.)

London and Port Stanley Ry.—The Dominion Parliament has confirmed the lease of the line to the City of London, and authorized the electrification of the line, and the management of the same by a commission. The city may, for the purposes of its undertaking, operate steam or other vessels to and from Cleveland, Ohio.

The city is authorized by the bylaw passed in connection with the lease to expend $700,000 on the electrification. It is said that much of the preliminary work for the electrification is being pushed forward, and that all the plans for it will be completed during this year in order that actual construction may be started in the spring of 1915.

We are officially advised that the only orders placed by the commission, which has in charge the electrification of the line, are for railway ties to the Manitoulin Lumber Co., and local reports state that the orders are for 75,000 ties, and 3,000 tons of rails.

Daily papers have been busy speculating as to when the contract for the electrification of the line will be let. Engineers of the Pere Marquette Rd., and of the Michigan Central Rd., which are both interested in the operation of the line, have been inspecting it, and have been in consultation with the Commissioners, and F. A. Gaby, Chief Engineer Hydro Electric Power Commission of Ontario, in connection with the matter. Representatives of several contracting firms have also gone over the line, but the reports state that the contract will be given to the Michigan Central Rd.

The specifications prepared for the work are very voluminous, and it is said that in many respects they are to be the standard for any lines which may be built in connection with the radial railway building plans under the Hydro Electric Power Commission of Ontario. The work in this case differs from the building of a new line, in that it consists first of all of the rebuilding of an existing line, on which traffic is to be carried during construction, and its electrification. The expectation is that the present line will be reconstructed, with a second track between London and St. Thomas, and long passing tracks at several points between St. Thomas and Port Stanley. It is not likely that the work will be let in one general contract, but that the rebuilding of the line will form one contract, and the electrification another.

London St. Ry.—An agreement has been signed between the city and the company as to the operation of traffic on the London West Line, for three months, pending the installation of a switch at Wharncliffe Road. (Dec., 1913, pg. 593.)

Medicine Hat, Alta.—The City Council has authorized the City Engineer to prepare estimates of the cost of electrifying the line built by the city to connect with the Ansley coal mine.

Montreal Tramways Co.—The Montreal Board of Control decided June 4, to permit the company's tracks to remain on City Hall Ave., between Ontario and Sherbrooke streets, notwithstanding the fact that traffic over that section had been abandoned. The city was desirous of having the tracks removed so that the whole street might be asphalted, but E. A. Robert, President, wrote stating that the company desired to have the tracks remain, as it was desired to use them at some future time. (April, pg. 184.)

The tramways situation was discussed between representatives of the company and the Board of Control, June 16, and after two hours of private discussion an adjournment was made to June 23.

Moose Jaw Electric Ry.—The extension of the line through Kingsway Park, Moose Jaw, Sask., was opened for traffic May 20. (May, pg. 231.)

The Montreal City Council took into consideration, on June 8, a report of the Board of Control upon transportation in the city. The council referred the report back, requesting the Board to resume negotiations with the M. T. Co., but declining to appoint any members of the council to act with the board.

Ottawa Electric Ry.—We are officially advised that the company is building a new steam plant. The building is of brick on concrete foundation, with concrete roof. The boiler room is 86½ by 40 ft. and 48 ft. high, will be equipped with three Babcock and Wilcox marine type water tube boilers, with integral superheaters, having a capacity of converting 90,000 lbs. of water per hour, with 200 lbs. steam pressure. Each boiler will be fitted with a 5½ ft. smoke stack, 60 ft. long, with induced draught fan driven, by separate motor on each fan. The coal will be kept in a concrete lined steel bunker of 300 tons capacity. It will be crushed, elevated to the bunker and carried in spouts to the hoppers where it will pass to Babcock and Wilcox chain grate motor driven stokers. The ash will be removed by spiral conveyors, elevated to a hopper, and delivered outside the building through a spout. Water will be fed to the boilers by two Weir vertical pumps, each capable of supplying all the boilers. The

coal crusher, elevator and conveyor, and the ash handling machinery will all be motor driven.

The engine room is 86½ by 25 ft., and 30 ft. high. It will be equipped with one 4,000 k. v. A., 2,400 volt turbo generator 3,600 r.p.m. The field will be excited by a 60 k. w. 125 volt, d. c. generator direct connected to a 90 h. p. 440 volt induction motor. The engine room will also contain a 1,000 k. w. motor generator set.

The Ottawa City Council proposes to reopen with the company the question of the erection of a bridge over the Rideau Canal. The company desires the building of a high level bridge at a cost of $205,000, while the city favors a low level bridge, with an electrically operated draw span, at a cost of about $100,000. The city has legislative authority to expend $80,000 as its share of the cost.

Prince Albert, Sask.—Press reports state that the City Council has not made any investigation of the possibility of building a municipally owned electric railway. An application for a franchise in the city has has been made by the interests owning the Moose Jaw Electric Ry., and this is under consideration.

Rainy River Radial Ry.—The Dominion Parliament has granted an extension of time for starting construction of this projected electric railway in the Rainy River District, Ontario. (Jan., 1913, pg. 39.)

Saskatoon Municipal Ry.—The by-law to provide $15,000 for a site for a new power house, which was defeated in May, was again submitted to the ratepayers of Saskatoon, Sask., June 5, and was carried by 543. The new power house is required to take care of increasing demands of electric railway, power and lighting purposes. (June, pg. 283.)

Sudbury, Copper Cliff Suburban Electric Ry.—Press reports state that grading has been started in Sudbury, Ont., on this line, which is to connect Sudbury, Copper Cliff and other places. The Mayor of Sudbury turned the first sod May 30. C. McCrea, M. P. P., announced that it is the intention of the company to have the line from Sudbury to Copper Cliff completed this year, and after that extensions will be made to the various outlying centres around Sudbury. There are three lines at present contemplated, namely, Copper Cliff route, 5.1 miles; Ramsay Lake route, 1.2 miles, and Frood Mine route, 1.2 miles. The Town Council has the control of the track inside the town limits, and determines the method of construction. The company, therefore, let the contract for the concrete base and pavement to The Warren Bituminous Paving Co., which is doing the paving for the town. Ties are being delivered, and negotiations are in progress for rails. The franchise calls for the laying of girder rails, but the company is desirous of laying T rails, as these can be had at once, while girder rails are not so readily obtained. The Town Engineer favors the T rail, and the matter is in progress of settlement. C. D. Norton is engineer in charge of construction. (May, pg. 232.)

Toronto Eastern Ry.—We are officially advised that active work is in progress on the line. Steel has been laid between Oshawa and Bowmanville, Ont., and that portion is being ballasted. Steel is also laid from Oshawa to within a mile of Whitby. Grading was completed through the town of Whitby last spring, making a continuous grade between Pickering and Bowmanville. It is expected to have that portion of the line completed this year, and it is hoped also to complete a large percentage of the line between Pickering and Toronto. At present time nothing definite has been decided as to the operation of the line. (June, pg. 284.)

Toronto Suburban Ry.—The steel superstructure for the bridge over the Credit River, north of Meadowvale, Ont., on the extension to Guelph and Berlin, Ont., has been delivered at Cooksville, and will be carried over the company's own tracks to the site. Track has been laid practically from the crossing of the Etobicoke to the crossing of the Credit, and some ballasting has been done. (June, pg. 284.)

Transcona, Man.—The application of the Transcona Town Council to the Lieut. Governor in Council, for approval of the agreement made with J. H. Kern, Moose Jaw, Sask., for the building of an electric railway from Transcona to Winnipeg, was heard June 4. Opposition was made to the contract by the residents of South Transcona on June 5.

The Lieut- Governor in Council confirmed the recommendation of the Public Utilities Commissioner approving of the contract, but made the stipulation that the line to be built in Transcona must serve the South as well as the North side of the tracks of the National Transcontinental Ry.

Windsor, Essex and Lake Shore Rapid Ry.—The Windsor, Ont., City Council has asked the company to remove its tracks on Howard Ave., from the side to the centre of the road. The city has let a contract for paving the avenue, and the proposal is that the tracks will be moved while this work is in progress. (June, pg. 284.)

Winnipeg Electric Ry.—Grading and other work is being pushed on the seven mile extension of the Stony Mountain line of the Winnipeg, Selkirk and Lake Winnipeg Ry., into Stonewall, Man. Kilping Bros. have the general contract, and have sublet a portion to W. Vincent.

The company is reported to have acquired a property with 300 ft. of frontage on Main St., Stonewall, for terminals and station house. Some materials for the buildings on the site were delivered May 27. (June, pg. 284.)

Woodstock, Thames Valley and Ingersoll Electric Ry.—We are officially advised that a rotary convertor has been purchased, and is expected to be installed in the power house by July 1, so as to have the line operated by hydro electric power. The extension to the fair grounds, Woodstock, is only a matter of construction along a couple of blocks, and track is expected to be laid on it by October. I. Warfield, Woodstock, Ont., Superintendent; J. G. Wallace, K. C., Woodstock, trustee for bondholders. (June, pg. 284.)

Three Rivers Traction Co.—We are officially advised that it is intended to build the loop line in Three Rivers, Que., with a connection to the water front. The contract for the franchise with the city is practically settled, and it is expected to start construction during July. The company proposes ultimately to build a line connecting the parishes on the north shore of St. Maurier River, from Portneuf to Berthier, about 80 miles. The directors are:—J. E. Aldred, T. McDougall, H. Murray, W. S. Hart, J. G. Smith, Montreal; S. Murphy, Ottawa. (Jan., pg. 39.)

Toronto and York Radial Ry.—The city has given notice to the company that it intends to assume the ownership of 1,220 ft. of the Metropolitan Division, on Yonge St., Toronto, the franchise of which will expire in 1915. The Corporation Counsel advised that while this was not necessary, the giving of such a notice might prevent complications when the franchise expires.

Report and Recommendations to the Ontario Railway and Municipal Board, re Toronto Railway.

Some time ago, on account of various complaints made to the Board in connection with the Toronto Ry. service, the services of C. R. Barnes, J. H. Cane, and J. M. Cameron were engaged, to report on the traffic generally, and to make recommendations for betterment. The report, which was presented recently, states that the quality of the service which a company can furnish is closely related to and must be equitably based on its earning power. Regarding additional cars, the present seating capacity of the cars, taken between 5.15 and 6.15 p.m., is given as 29,069, and it is recommended that this be increased by 10,813, half of this additional capacity to be made by Nov. 1, 1914, and the balance by Nov. 1, 1915. Increases of seating capacity are also recommended during the general rush hours, and on Sundays. Among other suggestions made are that cars be heated during the winter by modern heaters, one third of the cars to be equipped during this year, one third in 1915, and the balance by Nov. 1, 1916, also that the cars be equipped with legible route signs at the sides, and destination signs at the ends. The platforms of 202 double truck cars to be lengthened, 31 single truck cars and 71 closed trailer cars to be replaced by Nov. 1, and 29 new cars to be placed on new lines by the same date, plans of which are to be submitted to the Board for approval within 30 days.

The relaying of about 13½ miles of track, and extensions of existing track, are recommended as follows:—Extension on Wilton Ave. easterly through the new streets which the city is preparing to open, through the proposed subway under the G.T.R. and crossing the G.T.R. coal siding at grade, to Pape Ave., thence north to Danforth Ave., where the city runs a car line. As this would necessitate the building of a subway under the G.T.R. on Pape Ave., it is suggested that a stub line be run temporarily. It is estimated that approximately 9,000 people would be served by this line. A new intersection is suggested at College St. and Spadina Ave., where the congestion is particularly bad, caused by the number of car movements and alleged wrong track location. The intersection at College, Yonge and Carlton Sts. should also be relaid by the installation of special work, with curves so constructed as to permit of more freedom of car movement, and a similar recommendation is made as to the intersection at Broadview and Gerrard St.

A number of changes in routes are also recommended, involving a considerable amount of new construction, as follows:—Extension of tracks on Teraulay St., from Agnes to College, allowing of the removal of the College cars from Yonge St., and as soon as the proposed street extensions are opened up, the Teraulay St. line should be continued through to Bloor St., allowing of further rearrangement of routes; extension of the Bloor St. line from Lansdowne Ave. to High Park, subways to be built under the G.T.R. and C.P.R., pending which the Queen St. cars to be operated through to the Park on tracks to be laid; extension of the Harbord St. line through Ossington, Lappin, Hallam and Antler to Dundas St., requiring subways under the G.T.R. and C.P.R., pending which a stub line should be operated between the G.T.R. Northern Division and the main line; extension of new tracks through Macpherson Ave., from Avenue Road to Yonge St., allowing of the establishment of an additional belt line by connecting the Bathurst and Dupont lines, pending the construction of these lines a belt line to be operated by continuing the Dupont line on

its present route, requiring a curve connection from Bathurst to Dupont St., thus completing the track layout at this intersection for belt line operation. These track extensions are based on present traffic necessities and should be built in the immediate future.

Operation of the system with the proposed additional equipment and the rerouted lines would be facilitated by the erection of a new car barn and storage yard in the outlying sections of the eastern part of the city. The cost is given approximately as follows:—

Cars, 180 two car trains, at $12,000	$2,160,000
Track extensions and special work.	250,000
Power and rotary converters, 8,500 k.w. at $40	340,000
Copper	200,000
Total	$2,950,000

The report came before the Ontario Railway and Municipal Board, June 12, when counsel for the T. R. Co. stated that he was surprised at the short time which the company had been allowed to peruse the report, which involved such a large expenditure. More time must be allowed, and it might be necessary for him to call witnesses. The Chairman of the Board stated that the Board had accepted the report as it stood and did not propose to have witnesses called to dispute the evidence contained therein. All the company could do was to suggest a way or some means to overcome the conditions outlined in the report. A further hearing was held, June 26.

(**Editor's note.**—The foregoing approximate cost of the work as recommended does not appear to include any amount to cover the building of subways, the larger proportion of which would probably fall on the Toronto Ry., though grants would possibly be made from the railway grade crossing fund, and contributions ordered from the city and the railways concerned.)

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and allied companies.—Gross earnings for April, $698,508; operating expenses, maintenance, etc., $502,546; net earnings, $195,962, against $706,333 gross earnings; $504,399 operating expenses, maintenance, etc.; $202,234 net earnings for Apr., 1913. Aggregate gross earnings for 10 months ended Apr. 10, $7,450,590; net earnings, $2,024,821, against $7,109,554 aggregate gross earnings; $2,028,898 net earnings for same period, 1912-13.

Cape Breton Electric Co.—Gross earnings for April, $27,916.65; operating expenses and taxes $15,857.77; net earnings $12,058.88; interest charges $4,891.67; balance $7,167.21; bond sinking and improvement funds $1,190; balance for reserves, depreciation, etc., $5,977.21, against $26,505.11 gross earnings; $16,694.57 operating expenses, taxes, etc.; $9,810.54 net earnings; $5,236.71 interest charges; $4,573.83 balance; $1,190 bond sinking and improvement funds; $3,383.83 balance for reserves, depreciation, etc., for Apr., 1913. Aggregate gross earnings for 4 months ended Apr. 30, $109,550.52; net earnings $43,074.04; interest, bond sinking and improvement funds, $25,359.79; net balance, $17,714.26; against $112,581.35 aggregate earnings; $45,154.96 net earnings; $24,402.82 interest bond sinking and improvement funds; $20,752.14 net balance for same period 1913.

Grand Valley Ry.-Brantford St. Ry.—The several cases arising out of the affairs of these companies, in which the Brantford, Ont., City Council is involved, were on June 1 ordered to be removed from the lists in the Second Appellate Division Court of Ontario, without prejudicing the right of either party to have them restored on two days notice.

A meeting of bondholders was held in Toronto, June 15, but was adjourned to July 15, by which time it is expected that all the details in connection with the transfer of the lines to the city of Brantford will have been completed, and the papers ready for the final signatures.

Montreal Tramways Co.—It is reported that the earnings for the financial year ended June 30 will show a considerable increase over those of the previous year, and that for the first time in the history of the company they will exceed $7,000,000. For the year 1912-13 the earnings were approximately $6,754,227.

Ottawa Electric Ry.—Under the provisions of the mortgage trust deed of June 29, 1897, 15 shares of 4% debenture stock of $1,000 each are to be drawn for redemption, with interest, on July 5.

Saskatoon Municipal Ry.—Revenue for first week in June, $3,473, against $2,948 for corresponding week in May. The receipts on June 6, were $680, the largest amount of receipts for any day this year. The earnings are reported to be increasing since the straight 5c. fare was put in force; but the full effect of the change will not be noticeable for a few weeks, as the supply of reduced fare tickets in the hands of the public has not been exhausted.

Saskatoon Municipal Ry.—Traffic receipts for April, $13,103, against $12,296 for April, 1913. Passengers carried, 288,166; mileage of cars, 57,146, against 53,663 in April, 1913; gross earnings per car mile, 22.936 cents; operating expenses, 24.796 cents. Operating expenses, including interest on capital expenditure and sinking fund, $14,168; deficit for month, $1,065. Sutherland route.—Gross earnings, $1,271; operating expenses, $880; net earnings, $391. Passengers carried, 19,673; car mileage, 5,161.

Toronto Ry., Toronto and York Radial Ry. and allied companies.—Gross earnings for April, $830,299; operating expenses, maintenance, etc., $443.103; net earnings, $387,196, against $760,676 gross earnings; $397,875 operating expenses, maintenance, etc.; $362,801 net earnings for Apr., 1913. Aggregate gross earnings for four months ended Apr., 30, $3,292,255; net earnings, $1,572,773, against $3,028,408 aggregate gross earnings; $1,446,107 net earnings for same period, 1913.

The Toronto Ry. receipts for May were $534,465.77 against $510,769.20 for May, 1913. The percentage of earnings paid to the city, which is now calculated on a 20% basis, was $106,893.15, against $102,153.84 in May, 1913.

Winnipeg Electric Ry. and allied interests.—Gross earnings for April, $337,414; operating expenses, $190,815; net earnings, $146,599, against $323,563 gross earnings; $174,465 operating expenses; $159,098 net earnings for Apr., 1913. Aggregate gross earnings for four months ended Apr. 30, $1,418,875; net earnings, $582,386, against $1,324,509 aggregate gross earnings; $582,668 net earnings for same period, 1913.

Fares Advanced in Saskatoon.—The Saskatoon, Sask., City Council passed a resolution recently increasing the fares on the municipally owned electric railway to a straight 5 cent fare. As heretofore workmen's tickets are sold at 8 for 25 cents, to be used between 6 and 8 a.m., and school children are carried at half fare to and from school. The 6 for 25 cents tickets outstanding will be honored. The change went in operation June 4. The reason for the change was the deficit of $14,000 in operating the cars, and the Commissioners expect that this will be wiped out by the increased receipts.

Hydro Electric Power Commission of Ontario and Projected Electric Railways.

Meetings have been held at a large number of places throughout Western Ontario, at which resolutions have been passed favoring the construction of electric railways in connection with the Hydro Electric Power Commission of Ontario. The main object is to stimulate interest in the building of lines upon this public ownership plan. The Commission's engineers are investigating traffic possibilities throughout the whole territory, to ascertain what are the most likely points between which trunk lines should be built, and what local lines it will be necessary to build to give the best service to the territory between the trunk lines. It will be some time before anything definite comes of these investigations.

The first line suggested to be built to utilize power from the Commission is from Toronto to Markham, Port Perry and other points, which was fully described in Canadian Railway and Marine World for Nov., 1913. At a meeting of representatives of the various municipalities interested, in Toronto, June 10, it was arranged that the ratepayers will be asked to vote on Sept. 21 on the question of raising the necessary funds to build the line. F. A. Gaby, Chief Engineer of the Hydro Electric Commission, was present. The estimated cost of the line is $3,954,914, distributed among the township, village and town municipalities as follows:—

Scarboro Tp., 10.4 miles	$430,273.00
Agincourt	15,233.27
Markham Tp., 19.4 miles	700,600.00
Unionville	18,720.00
Markham Village	62,740.00
Mount Joy	17,945,45
Stouffville	75,829.42
Whitchurch Tp., 21.92 miles	497,710.00
Newmarket	272,700.00
Pickering Tp., 10.27 miles	417,600.00
Claremont	28,302.02
Whitby Tp., 14.2 miles	440,500.00
Whitby Town	179,532.00
Reach Tp., 9.8 miles	239,450.00
Port Perry	108,540.16
Uxbridge Tp., 11.56 miles	253,579.00
Uxbridge Town	180,677.82

Novel Electric Switching Locomotives have been placed in service on the Pennsylvania Rd. ore docks at Cleveland, Ohio, for handling cars. They do not operate on the same track as the cars they handle, but on a parallel 42 in. track. Each locomotive is equipped with an arm on each side, which can be lowered by means of compressed air, controlled from the cab, these arms acting as pushers to the cars on the adjoining standard gauge track. Single cars or trains can be handled equally well, and it has the especial advantage of facility in cutting out or shifting individual cars in a train with a minimum of shunting.

Motor Omnibusses for Winnipeg.—The Works and Property Committee of the Winnipeg City Council, June 4, recommended the passing of a bylaw granting a franchise to A. J. Andrews, K.C., and H. W. Adcock, representing the Winnipeg Omnibus Co., to operate motor busses on the streets. The agreement proposed to be made gives the company an exclusive franchise for five years. As soon as its terms are settled a bylaw confirming it will be submitted to the ratepayers.

Pitt River Bridge, Coquitlam, B.C.—A contract has been let to Armstrong, Morrison & Co., Vancouver, B.C., for the substructure of the bridge across the Pitt River at Coquitlam, B.C. The contract calls for the construction of seven open dredging caisson piers and two pile driven piers. The approach on the west end will be 300 ft. long, and that on the east end 465 ft.

Vancouver Board of Trade Endorses Increased Fares on British Columbia Electric Railway.

The British Columbia Electric Ry.'s action in increasing its fares in Vancouver to 5 cents has been considered by a special committee of the Vancouver Board of Trade, the majority of which presented the following report, which has been adopted by the Board:

We feel that any findings this board makes should be based on a fair analysis of conditions, as to the cost of labor, cost of material, and any other exigencies which enter into the development, equipment and maintenance of a passenger carrying system, such as that provided by the B. C. E. R. Co. Your committee held 10 meetings and has obtained information with respect to the cost of fares and areas served by such fares, from Montreal, Toronto, Winnipeg, Edmonton, Calgary, Seattle, Portland, San Francisco and Los Angeles. We have also obtained a great deal of information from officers of the B. C. E. R. Co., who have invariably treated the committee with courtesy.

Our finding is that the B. C. E. R. Co. was, under existing conditions, justified in raising its fares, but that as soon as the present high proportion of expense to earnings can be reduced, a reconsideration of the fares charged will be justifiable. We submit the following as some of the reasons for our finding: The money actually expended up to June 30, 1913, amounted to $45,168,312. and the amount paid out in interest and dividends for the year was $1,888,139, equal to 4.18% on the entire investment.

During the last 10 years the cost of equipment, supplies and wages has increased at least 25%. The wages paid by the B. C. E. R. Co. are about 10% higher than those paid in any other Pacific coast city, and from 20 to 25% higher than those paid in the cities of Eastern Canada. Conductors and motormen on the company's system receive 27c. an hour for the 1st year, increasing to 36½c. in the 5th year, while Seattle pays 25c. the 1st year, increasing to 32c. in 15 years; Portland pays 25c. for the 1st year, increasing to 31c. in the 6th year; San Francisco pays 25c. the first year, increasing to 33c. in the 9th year; Los Angeles pays 25c. the 1st year, increasing to 30c. in 5 years; Montreal pays 23c. the 1st year, increasing to 25c. the 3rd year and thereafter; Toronto pays 23½c. the 1st year, increasing to 27½c. the 3rd year and thereafter; Winnipeg pays 25c. the 1st year, increasing to 34c. in the 4th year. A similar comparison of the wages paid to trackmen, barnmen and mechanics, shows a corresponding increase paid by the B. C. E. R. Co. as compared with the above mentioned cities. There are about 800 conductors and motormen employed in Vancouver and on the suburban lines, working an average of 9 hours a day. These men receive 18c. more per day than paid in any other coast city. This amounts to $52,560 in a year, and if we include the trackmen, barnmen and mechanics the amount would be more than doubled.

Equipment and supplies are about 15% higher in Vancouver than in other coast cities, and 10% higher than in Eastern Canadian cities. For example, a car costing $7,407.80 at Vancouver can be purchased in Seattle for $5,986.40, and in Toronto for $6,522.25. The Electric Railway Journal of Oct. 25, 1913, showed the operating expense ratios of 40 of the leading electric railway systems of this continent. The average is 59.09%, and the B. C. E. R. Co. has the highest ratio, 75.03%. The figures given relate only to straight operating expenses and do not include any charge for renewals, depreciation, taxes or accident reserve.

It has been put forward in a criticism of the B. C. E. R. Co. that other companies serve a greater area for the same fare than that railway, but we have considered that the area served by any railway is no indication of the service rendered to the public without taking into consideration the population, track mileage, and number of cars operated within that area. The North Vancouver service, with nearly 10 miles of trackage and a population of about 8,000, covers an area almost as large as the city of Vancouver with a population of 120,000 people, and 70 miles of trackage.

Another argument has been advanced in some quarters that owing to the policy of the company of contesting so many accident claims in court the expenses in connection with this department have been excessive. This statement has not been borne out by the facts, as the following figures will show: The total number of accident cases dealt with by the B. C. E. R. Co. from Jan. 1, 1911, to Feb. 20, 1914, was 1,420. Of these 66 were contested in court and 1,354 amicably settled without reference to law. This shows an average contested of less than 5%.

We asked the company to state to the committee the cost of power charged them and were informed that they could not answer specifically as to the charge per horse power or kw. hour, but submitted the following table showing the cost per car mile for the year ending June 30, 1913, as compared with the cost on other systems in Canada: B. C. E. R. 2.98c.; Montreal 2.62c.; Toronto 2.58c.; Winnipeg 2.81c.; Edmonton 11.22c.; Calgary 5.23c.

The revenue per car mile for four of the leading electric railway systems of Canada in 1912 shows Vancouver the least remunerative in that regard. Toronto provided $42,846 a car mile; Montreal $30,259; Winnipeg $23,230, and Vancouver $22,038.

We find further that with few exceptions the usual fare charged in the principal cities of the United States is 5c. In Canada the fare is usually about the same as that charged by the B. C. E. R. Co. previous to Sept., 1913. The straight 5c. fare is charged in nearly all the Pacific coast cities, including Seattle, San Francisco and Los Angeles. In Portland the fare is 5c. or 50 tickets for $2.25. To the best of our knowledge the B. C. Electric Railway Company is the only company on the Pacific coast selling workingmen's tickets at 4c. These are issued in 10 tickets for 40c., 5 white and 5 green, the white tickets being good from 5 to 8 a.m. and the green are good at all hours.

A good deal has been said about the distance that passengers are carried in other cities for one fare as compared with Vancouver. We think there is not much to complain of in this respect, as city passengers can travel from Alma Road and Tenth Ave. to Hastings St. and Boundary Ave., 8.35 miles, and settlers are carried from Dunbar St. and Wilson Road to Hastings St. and Boundary Ave., 11.78 miles, for 5c.

Notwithstanding the fact that the number of passengers carried has been steadily falling off from June last, the company is giving better service than ever, the number of car miles at present averaging about 90,000 a year more than in 1912. The growth of traffic in years previous to 1913 warranted liberal outlays in development and equipment, and consequent on these outlays the operating expenses increased very considerably. In 1908 the rate of operating expenses of the railway department, exclusive of interest on outlay, was 71.09% of gross earnings; this ratio increased to 91% in 1913. In 1913 the gross earnings were 3½ times as much as in 1908, but the net earnings were the same as in 1908, notwithstanding the fact, as stated by the company, that three times the amount of capital was employed in 1913 as compared with 1908.

The total capital invested by the company has increased by about $6,000,000 annually for the last five years, and now totals about $45,000,000. Your committee has taken into consideration that the securing of capital for such undertakings as this is naturally dependent upon a fair return on the investment. The conditions which we find justify the increase in fares, call for and have resulted in strict economy in expenses and management, and it may be reasonably expected that in time these economies will reduce the present high proportion of operating expenses sufficiently to warrant a reconsideration of fares charged, but such reductions cannot be expected to greatly influence return on invested capital until passenger traffic increases.

The Proposed Abolition of Running Boards on Toronto Railway Cars.

The Ontario Railway and Municipal Board heard an application, June 9, by the Toronto Ry. employes' union regarding the abolition of the outside running board on open cars. On behalf of the applicants, it was urged that this had been done in U.S. cities, and the adoption of centre aisle cars was suggested. H. G. Osler, K.C., representing the Toronto Ry., made various suggestions for getting over the difficulty, and it was stated that a simple way to handle the business would be to use the winter cars all the year round, and have the windows dropped in the summer.

In giving the Board's decision on the matter, D. M. McIntyre, Chairman, said:—"It is apparent to anyone that the conductors are asked to perform their duties under conditions with a very imminent element of danger with the cars running at a high speed. We have not hesitated to legislate in conection with factories, and we should allow the men to suggest means of eliminating that danger." He also asked the Toronto Ry. to submit, by Sept. 24, plans of arrangement of car design, which would do away with the running board on the open cars.

When interviewed on the subject, later, the General Manager of the Toronto Ry. stated that the matter would be placed before the company's car designers, for a report and advice thereon.

Morrisburg and Ottawa Electric Ry.—L. on Sydow, Engineer in Charge, Union Bank Building, Ottawa, has invited tenders up to July 4, for supplying the right of way, complete construction and equipment of about 35 miles of line, commencing at or near Ottawa and extending to Chesterville, Ont., payment to be made in bonds or stock, or both, of the company. (May, pg. 231.)

Woodstock, Thames Valley and Ingersoll Electric Ry.—We are officially advised that J. G. Wallace, K.C., Woodstock, Ont., is in possession of the line, its property and franchises, as trustee for the bondholders, and not as receiver, as reported. The operation of the line is in charge of Ira Warfield, Superintendent.

An application made by W. J. Baird, on behalf of British interests, for a motor bus franchise in Vancouver, is under consideration by the city council.

Electric Railway Notes.

The Winnipeg City Council decided, June 9, to take steps to attempt to compel the Winnipeg Electric Ry. to give a faster service on Sundays.

The Edmonton Radial Ry., operated by the City of Edmonton, Alta., has received one single end, double truck city car from the Preston Car and Coach Co.

The Board of Railway Commissioners has dismissed the Town of Aylmer's application for a reduction in fare on the Hull Electric Ry., between Ottawa, Ont., and Aylmer, Que.

In a case under the Workmen's Compensation Act the St. John (N.B.) Ry. has been ordered to pay $2,000 for the death of a lineman in its employ who was killed by coming in contact with a live wire.

The Brandon, Man., ratepayers voted, June 29, on a bylaw for the operation of cars on the municipal electric railway on Sundays. The result has not been received up to the time of going to press.

The Hull Electric Ry. has restricted smoking by passengers on its line to the last four seats on the Aylmer cars, and to the longitudinal seats on the C.P.R. local cars, provided that all the windows are open.

W. M. Charlton, Chairman of the Railway Committee, Brantford, Ont., received applications up to July 1 for the position of Manager of Brantford St. Ry., including the Grand Valley between Brantford and Galt.

An order is reported to have gone into effect June 17, under which the office of Allan Purvis, Manager, Interurban Lines, British Columbia Electric Rys., has been transferred from New Westminster to the general offices in the Carroll St. Building, Vancouver.

The Toronto Board of Control has decided to undertake the provision of about 20 motor busses for use in the outlying sections of the city. A bylaw is in course of preparation for submission to the ratepayers at an early date, for the provision of $300,000 in this connection.

During the course of the mediation proceedings at Niagara Falls, Ont., in connection with the United States-Mexican affair, the International Ry. has considerably increased the number of cars operated between Buffalo and Niagara Falls, and across the bridge, on account of the largely increased traffic.

The Lethbridge Municipal Ry. is now being operated on the one-man system, with a view to economizing expenditure. Notice of the dismissal of all employes was given June 5, and they were invited to make application for reinstatement by June 12. A new wage schedule has been put in operation, coming into force June 19.

Judgment has been reserved by the Imperial Privy Council in the appeal of the British Columbia Electric Ry. against an order of the Board of Railway Commissioners directing it to pay part of the cost of certain bridges over streets in Vancouver. The company also disputes the power of the Commission to make such a direction.

The Brandon, Man., City Council decided, June 15 to ask the Public Utilities Commission to relieve it from providing a depreciation allowance in respect of the municipal railway for one year. The council pointed out that the line is a comparatively new one; the city is providing a sinking fund and the revenues from the line are at present small.

The Montreal City Council passed a resolution, June 8, approving of the safety first campaign, started by the Montreal Tramways Co., and urging the citizens to co-operate in it. Superintendent Gaboury has addressed a letter explaining the movement to the various school authorities in Montreal and surrounding municipalities, and inviting co-operation.

The Montreal City Council, on June 8, took into consideration a suggestion to acquire the Mountain Incline Ry., so as to secure free transportation to the top of Mount Royal. The line is being operated under a contract, which terminates in 1922, and the city has power to expropriate. The City Attorney and the Civic Transportation Engineer were asked to report on the matter.

N. Cauchon, C. E., has written the Ottawa Citizen, advocating as a solution of the congestion and of the housing problems in Ottawa, the construction of a rapid transit line round the main part of the city, with a depressed line along the bed of the Rideau Canal. From this belt line radial lines could be built to all points. The project he suggests should be carried out as a national-civic undertaking.

The Niagara, St. Catharines and Toronto Ry. has received 6 double end, double truck, p.a.y.e. cars from the Preston Car and Coach Co. They are mounted on standard trucks with Canada Iron Corporation steel wheels. The electrical equipment is Canadian Westinghouse 101 B2 quadruple equipment with K28 control, and Westinghouse S.M.1 air brakes. The cars are 30 ft. 10 ins. long over corner posts, platforms 6½ ft. long, seats upholstered in rattan. They have Coleman stationary fareboxes, Keystone destination signs, pneumatic gong and pneumatic sander. The outside is painted a steel gray, which has been adopted as the Niagara, St. Catharines and Toronto Ry.'s standard color.

The Ontario West Shore Railway.—Representatives of the municipalities of the towns of Goderich and Kincardine, and the townships of Huron and Ashfield, held a joint meeting at Kintail, Ont., June 25, to consider the position in regard to the unfinished railway, of which they had guaranteed the bonds for various amounts respectively. Full details as to how matters stand, together with the report of the Ontario Railway and Municipal Board, were given in Canadian Railway and Marine World for June. After some discussion, it was decided to advertise the road for sale, with the condition that the municipal officers concerned would have the power to reject all offers for purchase, if the price and conditions were not up to expectations. It was also decided to commence proceedings for recovery of the money lost to the municipalities, and which had not been actually spent on construction, including amounts received on the sale of bonds and interest. The meeting passed a resolution urging on the Attorney-general of Ontario to prepare with all possible speed the necessary evidence for the extradition of J. W. Moves, on the charges against him, if extradition were found to be necessary, and also asking that the greatest possible effort be made to locate him. It was explained to the meeting that he had been traced to Scotia Jct., where all track of him was lost.

E. Bower. Travelling Passenger Agent, Canadian Northern Railway, Saskatoon, Sask., writes:—"Success to Canadian Railway and Marine World. It is full of useful data."

Central Railway and Engineering Club.—The seventh annual outing took place June 20, by special train from Toronto to Erin, Ont.

Interurban Cars for Toronto Suburban Railway.

The Toronto Suburban Railway has under consideration tendered for six double truck cars for its Lambton-Guelph extension, which is under construction. They are to be of the centre entrance type, with central partitions dividing the main part of the car from the smoking section. Three of the cars will be for passengers only, while the other three will have a small baggage compartment in the end of the smoking section, from which it will be taken, leaving the main part of the car the same in both cases. There will be emergency exits front and rear, but there will be no end bulkheads. They will have a seating capacity for about 70 passengers, and will approximate 55½ ft. long and 8½ ft wide. The underframing will in all probability be of steel, and it is possible that the whole car frame may be of steel construction. The body will be mounted on double trucks, and will have four 80 h.p. motors. The electrical equipment has been ordered from the Canadian General Electric Co.

The Snow Removal Problem on Street Railways.

Over 100 city officials, engineers, contractors and others who have to cope with the snow removal problem, met in Philadelphia, Pa., in response to an invitation from the Director of the Department of Public Works of Philadelphia, to participate in a snow removal conference.

M. Schreiber, Engineer of Maintenance of Way, Public Service Rys., Newark, N.J., explained the snow fighting organization of a street railway system of 865 miles of track. Before winter sets in the officers of all departments meet and agree upon a snow fighting campaign. Then all departments co-operate with a central organization which handles all the snow removal work. Mr. Schreiber brought out clearly that the success of the street railway forces was due to the compact and efficient organization, and he believed there was an opportunity for much greater co-operation between the city snow removal forces and those of the street railways.

The use of spreader plows for cleaning wide strips each side of the street car tracks was discussed and appeared to be feasible for the lighter snowfalls. These spreader plows have been used in Detroit and other cities for many years. M. R. Sherrerd, Chief Engineer, Board of Street and Water Commissioners, Newark, N.J., considered this a feasible way of opening streets and urged a closer co-operation between the cities and the street railway companies.

SIR ALBERT STANLEY, who was created a baronet on the King's birthday, is Manager, London Underground Ry., and though born in England, was, for a number of years, connected with the Detroit United Ry., and the Public Service Rys. of New Jersey.

SIR ADAM BECK, M.L.A., who was knighted on the King's birthday, is Chairman of the Hydro Electric Power Commission of Ontario, and is promoting the construction, by rural municipalities, of interurban electric railways under the Commission's control.

H. Powell, Section Foreman, Atlantic, Quebec and Western Ry., Barachois de Malbaie, Que., in renewing his subscription, writes: "I should miss Canadian Railway & Marine World very very much."

Marine Department

The Standard of Construction for Great Lakes Vessels.

The London, Eng., correspondent of the Toronto Mail and Empire wrote recently as follows: "The heavy losses caused by the November storms on the Great Lakes still forms a subject of discussion in marine underwriting circles here, although the bulk of the liability has had to be borne by the American market owing to the refusal of Lloyd's and the British companies to accept the risks at low premiums. The hope is now expressed that as regards the classification of the steamers employed, the requirements of Lloyd's Register will be adopted as extensively as those for ocean-going vessels, some of the boats at present employed being, it is feared, lacking in longitudinal strength. In fact, the rules of Lloyd's for lake steamers were formulated after a careful investigation of the conditions under which they are usually employed, and it is believed that if they were more generally observed the disasters would not occur on such a large scale again. If not, it is likely that insurances will in future be difficult to effect, on this side at all events."

A Shipbuilder's Opinion.

In reference to the foregoing, J. M. Smith, Manager, Collingwood Shipbuilding Co., Collingwood, Ont., has written us as follows:—

"It is quite true that many of the ships built in the American shipyards on the Great Lakes are not built as strong as Lloyd's requirements call for. There are a number of ships, however, that are built quite as strongly as Lloyd's rules call for, and most of the latter are classed in the Great Lakes Register, which is an offspring of Bureau Veritas, which might be termed French Lloyd's. We have found that the requirements of the Great Lakes Register are very complete, and the given dimensions of materials are very intelligently worked out, and ships built to class in this register are quite up to any requirements of British Lloyd's. There are some ships built on the lakes that are classed in Lloyd's Register, they are good ships, but they are not any better nor any stronger than the ships that are classed in the Great Lakes Register. It would be much better in the long run for the shipowner if all ships were built equal to the requirements of some good classification society. I believe it is true that some of the ships that were lost may not have been built quite up to the requirements of such classification societies, but the majority of them were good ships. Some of the older ships may have been lacking in longitudinal strength, but I think that the most of the ships that have been built on the lakes in recent years are quite strong enough for the requirements of the service.

"The steamer Wexford, which was lost off Goderich, was built to class in Lloyd's Register, and although she was an old ship she had been repaired and rebuilt until she was a good sound ship. I believe that the Regina, which was lost at the same time, was built to class in the British Corporation. The James Carruthers, which was lost somewhere above Goderich, was built to the highest classification of the Great Lakes Register, and was, without doubt, the strongest built freight ship on the Great Lakes, and it was not want of strength that caused any of these three ships to founder. They were all fitted with good machinery, and had plenty of power, but, no doubt, they met a condition out on Lake Huron that could not be compared with ordinary heavy gales, possibly they encountered something of the nature of a cyclone sweeping down the centre of the lake.

"The shipping trade on the Great Lakes has developed a distinct type of ship where large cargoes are carried on a moderate draught of water. The ships are built for a moderate price and are operated at a moderate cost, they are very suitable for the trade, no doubt, however, many little improvements will be added to them from time to time.

"I do not think that the ships that foundered in the storm last November were lost through carelessness on the part of the owners, or on the part of the officers or crews. My own belief is that they encountered an unusual storm, and the high winds, combined with an extremely violent snow storm and zero weather, made a combination that was almost impossible to contend with, and I think all of those ships would have reached port safely if they could have turned around and run before the storm, but, unfortunately, Lake Huron narrows down to about a quarter of a mile wide where it enters the St. Clair River at Port Huron and the waters are shoal for a good many miles before entering the river, and the ship masters knowing this would not dare to run for the river, and, no doubt, they turned to fight it out. Possibly the ships were thrown in the trough of the sea, and if so they would have little chance of recovery.

"We have built over 40 vessels here during the past 12 years, and they were all built equal to Lloyd's requirements. The most of them have been for service on the Great Lakes, and a few for service on the sea coast."

A Vessel Man's Opinion.

One of the best known men interested in the Great Lakes shipping business has written us as follows:—"There is nothing in the statement of the Mail and Empire's London correspondent. So far as I have heard, and I would be certain to hear of it, there has been no question raised yet by the underwriters in connection with the seaworthiness of lake steamers, either Canadian or United States, as they recognize that, with exceptional storms, there is always danger of ships being lost, and it is that risk which enables the underwriters to get business.

"Regarding the question of longitudinal strength, there has been no evidence so far that any of the ships which came to grief on the lakes in the storm of Nov. 9th were lost through lack of longitudinal strength. On the contrary, so far as I can learn, none of the ships failed in this respect while they were afloat, and any ships, when loaded, no matter how strongly they are built, are liable to break if thrown up on the rocks in a seaway, and bearing probably amidships with the two ends hanging, giving the same effect as bending a stick over your knee. Any evidence which has developed so far would indicate that the ships were more likely to have been lost from their hatches, or deck houses, or both, and the evidence would seem to be very strong on these two points, although nothing is known definitely, and never will be known probably, regarding the ships which foundered, but with those which were thrown up on the beach, these are the two points which suffered most.

"Regarding the classification of ships on the lakes, just as on the ocean, they are not classed exclusively by any one classification society. I believe there are eight United States lake freight vessels classed by Lloyd's Register, and it would be very difficult for Lloyd's, or anyone else, if not impossible, to show that any one of these is stronger as far as longitudinal strength is concerned than was the s.s. James Carruthers, which was classed by the Great Lakes Register of Cleveland, a classification society approved of and controlled by the U.S. underwriters. The majority of the vessels on the Great Lakes, especially those built in Britain, were classed by Lloyd's and British Corporation. The balance of the vessels on the lakes, I believe, are in the majority of cases classified by the Great Lakes Register of Cleveland. A great deal of nonsense has been written in connection with these losses by people who do not know what they are writing or talking about, and you can quite understand that Lloyd's are anxious to class all the vessels possible, as there is a fee in it for them, just as the wireless companies have been trying to make capital out of that storm and get more vessels to equip with wireless outfits, but, although I have asked the representatives of one of the wireless companies to give me the name of any ship which received any warning by her wireless of that storm of Nov. 9, and avoided the storm as a result of that warning, they have failed up to date to give me the name of any ship."

Welland Ship Canal Construction Contracts.

In Canadian Railway and Marine World for June, page 286, was given a list of the tenderers for the various sections on the Welland Canal, and in each section the name of the successful tenderer was shown in capital letters. This information was as given by the acting Minister of Railways and Canals in response to questions in the House of Commons. In regard to sec. 3, it was noticed that there was a discrepancy as to the name of the successful tenderer, as compared with that previously announced, and given in C. R. & M. W. for May, pg. 242. This was brought to the Department's attention, and we are officially advised that certain information which was supplied to the acting Minister was incorrect. The contract for sec. 3 was awarded to the lowest tenderers, O'Brien, Doheny, Quinlan and Robertson, Montreal.

The British Board of Trade has issued invitations to the various branches of the Imperial Merchant Service Guild, which represents about 75% of the total British captains and officers, to send representatives to a general conference with the Board of Trade authorities in London, Eng., on several suggestions for alterations to the International Regulations for Preventing Collisions at Sea. The suggestions cover the making compulsory of a second mast head light, a fixed stern light, a special signal for motor vessels proceeding under sail and mechanical power simultaneously, a suitable sound signal for a vessel in tow, and an addition to the distress signals by the inclusion of the radiotelegraph distress signal.

Rumors Concerning Canada Steamship Lines, Limited.

During the past few weeks a number of rumors concerning the position of Canada Steamship Lines, Ltd., have been freely circulated, and in this connection, Jas. Carruthers, President, has made the following statement,—"On account of erroneous, and in many cases, maliciously false reports, which have been circulated, I consider it my duty to the shareholders to lay the following facts before the public: To the assertion that Canada Steamship Lines, Ltd., owes the Bank of Montreal, the only bank with which it does business, $1,250,000, I may say that the company does not owe the bank a cent. On the contrary it has a considerable amount to its credit there. Then I hear that there is a report to the effect that the company, while it got 6c. last year for transporting wheat is only getting 2½c. a bush. this year. The truth is that we have been getting from 4½ to 6½c. a bush. this year—a reduction from last year, it is true, but one offset by the fact that the company is enabled, by the greater size of some of the boats employed, in this trade, to transport not only much more economically than ever before, but with better dispatch at both ends."

Regarding general receipts, the President said although it was impossible to forecast the future, the freight and passenger receipts are so far this year, ahead of those of the same period last year, and contracts for shipments have been made assuring satisfactory profits for a good part of the season. On the question of freight rates, he stated that the average rate received for grain last year was 5½c. a bush. for the whole season. During this season the rate commenced at 6½c., and it now is 4½c., and he announced that the company had booked at 5½c. for October. He also stated that all of the vessels in the company's service were in operation.

Stern Wheel Steamboats for the Saskatchewan River.

Canadian Railway and Marine World for June contained some reference to the two steamboats which the Saskatchewan Steamship and Coal Co. has arranged to operate on the Saskatchewan River, between Prince Albert and North Battleford, Sask., and Edmonton, Alta. The hulls are being built at Prince Albert, and the machinery is being supplied from Chicago, Ill.

The vessels will be about 140 ft. long by 35 ft. beam, but full details have not been settled, and some changes may be made. The engines will be of the direct acting type, each cylinder being 14 ins. diar. by 60 ins. stroke, with double steam chest and ring fitted piston valves. The cylinders will be adjustable, on mild steel bedplates, being arranged for lining up. The wheel shaft will be of forged steel 7¾ ins. hexagon, built to conform to Canadian regulations, and fitted with forged steel cranks hammered out of the solid; crank pins forged steel and in proportion to the wheel shaft; wheel shaft fitted with four steel flanges for a 16-arm paddle wheel; crossheads of steel fitted with bronze gib adjustable both top and bottom; eccentric rods of extra heavy gauge tube and wood filled; connecting rods wood filled, with forged steel straps held in place by through bolts; connecting rods fitted with strap and key takeup boxes; the fittings for the engines will include marine lever throttle valve, sight feed lubricators, cylinder drain valves, grease cups, oil cups, etc., and the engines will be operated by Stephenson link, and latch handle locomotive reverse lever working in double quadrant with cut-off notches indicated. The boilers will be of the horizontal return flue, internally fired, Clyde marine type, 6½ ft. diar. by 11 ft. long, each containing 94 tubes 3 ins. diar, fitted with Morison furnaces 40 ins. diar. outside, with steam dome 40 ins. diar. by 36 ins. high. The boilers are built according to the Canadian regulations for a working pressure of 175 lbs. The feed water pumps are 6 by 4 by 6 with auto positive injectors, fire pump 6 by 4 by 6, of the ram type. The exhaust steam passes through a feed water heater consisting of a double galvanized spiral pipe casing with iron pipe coil. The vessels will be equipped with double drum steam capstan fitted to the forward deck, operated by double 5 by 7 engines, and driven by all steel gears. The electric equipment will include a 100 light generating set, the dynamo being direct connected to a 6 by 5 engine; and a 15 ins. searchlight fitted with mirrors will be fitted and controlled from the pilot house. The steering wheel will be 7 ft. diar., of hardwood, with connections for three rudders.

The Keystone Transportation Company's s.s. Keynor.

The s.s. Keynor, which has been built for the Keystone Transportation Co., Ltd., Montreal, by the North of Ireland Shipbuilding Co., Ltd., at Londonderry, Ireland, recently, has the following dimensions:—Length b.p. 250 ft.; breadth extreme 42½ ft.; moulded depth 20 ft. She has a corresponding draught in fresh water of 14 ft., and a deadweight carrying capacity of about 2,300 tons.

She has been built to Lloyd's highest class for service on the St. Lawrence River and Great Lakes. Her machinery consists of triple expansion engines supplied with steam from two single ended boilers, fitted with Howden's forced draught. She has 4 special steam winches and a complete outfit of derricks, etc., for dealing with cargo, also powerful steam windlass, a steam steering gear, electric light throughout, the navigation lights, compasses and telegraphs being electrically lit.

Very complete accommodation for the owners as well as state rooms and rooms for officers and deck hands is provided in the forecastle, with the captain's accommodation in a house on the deck above, the pilot house for navigating purposes being on top of the captain's quarters. The dining room, kitchen, pantry, cold store, engineers' rooms and excellent accommodation for firemen, etc., are in a large deck house at the after end of the vessel.

The Keynor sailed from Londonderry June 6, for Sweden, to load wood pulp, after which she left for Montreal, where she is expected about the middle of July. She is a sister vessel of the Keyvive, owned by the same company.

The Sault Ste. Marie and the Suez Canals Compared.—In the last issue of Canadian Railway and Marine World was given some figures comparing the traffic through the Sault Ste. Marie Canal with that passing through the Suez Canal. The figures relating to the Sault Canal were those for 1912, and related to the United States Canal only. The total number of vessel passages through both the Canadian and U.S. canals for 1912 was 22,778, with a registered tonnage of 56,736,807, and for 1913, 23,795 total vessel passages with a registered tonnage of 57,989,715.

Another Projected Merger in Great Lakes Navigation.

A navigation company, which will probably be named the Gulf and Lake Navigation Co., is said to be in process of formation in Toronto, and in this connection, negotiations are reported to be proceeding with the Farrar Transportation Co., for the acquirement of its property. It is reported that the Farrar Transportation Co.'s shareholders have been offered $125,000 in cash, $25,000 in 7% cumulative preferred stock, and $125,000 of common stock in the new company. This would work out at approximately $62, one share of preferred and half a share of common stock, for each share now held. It is also reported that the new company will issue bonds to the extent of 50% of the appraised physical assets, with preferred stock and common stock issues of similar amounts respectively. It is stated that an elevator has been acquired at Kingston, Ont., and docks at Oswego, N. Y., near the outlet of the Erie Canal, for the purpose of routing grain to New York.

J. W. Norcross, Managing Director, Canada Steamship Lines, Ltd., was mentioned as being concerned in the matter, together with some U. S. interests, but is reported to have stated that he had no interest in it, and that the new company would have no connection, either directly or indirectly, with Canada Steamship Lines, Ltd.

The Farrar Transportation Co. owns the steamships Collingwood and Meaford, valued in its last balance sheet at $408,409.03, and at Dec. 31, 1913, showed total assets of $496,454.85, with an excess of assets over liabilities of $163,976.63 The gross earnings for the year were $166,620.33, with a net profit of $62,778.37. There was a bonded indebtedness of $81,000 on the s. s. Collingwood, and there was an amount on hand to take care of the interest and principal payments on this for the next three years. The intrinsic value of the shares at the close of the year, was placed at $165.55 each. A dividend of 10% with a bonus of 5%, was paid for 1913. The officers are,—President, T. I. Thompson, Owen Sound, Ont.; Vice President, E. R. Wayland, Fort William, Ont.; Secretary-Treasurer and Managing Director, G. E. Fair, Toronto; other directors, E. Stubbs, Sault Ste. Marie, Ont.; D. D. Lewis, Lorain, Ohio; W. E. Allen, Toronto; M. Snetsinger, Thornbury, Ont.; G. P. Pearsall, Collingwood, Ont.; and C. I. de Sola, Montreal.

The Cunard Steamship Co's report for 1913 shows that, including £88,964 8s. 0d. brought forward from 1912, the profits were £1,276,795 0s. 10d. After debiting income tax and debenture interest and reserving £443,637 4s. 9d. for depreciation, there is at the credit of profit and loss account, £710,364 17s. 4d. Of this, £300,000 has been placed to repair and renewal fund, £57,735 to insurance fund, and £100,000 to reserve fund. A dividend of 5% has been paid on the preference stock, amounting to £59,735 to insurance fund, and £100,000 to declared on the ordinary shares, leaving £130,377 17s. 4d. to be carried forward to the current year's accounts. The report states that the steamships Andania and Alaunia were received from the builders, July 1 and Nov 13 respectively, and were placed in service on the Canadian route. A contract has been placed at Wallsend on Tyne, Eng., for the construction of another passenger and cargo steamship, to be named Aurania, for the London-Canada service.

The name of the steamboat Clyde, purchased from foreigners, has been changed to Stanstead.

The Wreck of the C.P.R. s.s. Empress of Ireland.

The s.s. Empress of Ireland, which was sunk in collision off Father Point, in the St. Lawrence River, May 29, with the s.s. Storstad, under charter to the Dominion Coal Co., was built at Glasgow, Scotland, in 1906. She was divided into 10 watertight compartments by bulkheads. Three decks surmounted the main structure of the hull, forming capacity for the accommodation of passengers, and giving the vessel a high appearance from the water line, and a big distance from the load waterline to the upper deck. The shortened decks of the upper structure were carried to a greater length than usual with this type of vessel, giving larger space in the saloons and recreation rooms. She was a three deck shelter deck vessel with promenade deck, upper promenade deck, and boat deck above, built to Lloyd's highest class. There was a cellular double bottom, fore and aft, capable of carrying 1,000 tons of water ballast, and in addition 1,900 tons were carried in deep tanks. She was steered by a balanced rudder operated by two steering engines on the telemotor principle, the gear being under water to meet the British Admiralty's requirements, to be approached either from above deck or from the shaft tunnels. For the safe navigation of the vessel and the accommodation of those responsible for it, every possible provision had been made. From three positions on the bridge, and two aft, the vessel could be steered, and the engine room bulkhead, steering and deck telegraphs and telephones were fully and conveniently installed. For the accommodation of the captain and deck officers, excellent quarters were provided in a steel house on the navigating bridge. Above the latter was the upper navigating bridge with the usual steering wheel, compass and searchlight. The propelling machinery consisted of quadruple expansion engines balanced on the Yarrow Schlick and Tweedy system to reduce vibration to a minimum, with an indicated horse power of 18,500, for a speed of 20 knots an hour. There was a full equipment of wireless telegraph and submarine apparatus, and more than ample lifeboat and life saving appliances. There was capacity for 10,000 tons dead weight cargo, and 4,000 tons of coal. Her dimensions were: length 548.9 ft., breadth 65.7 ft., depth 36.7 ft.; registered tonnage 14,191. There was accommodation for 432 first, 328 second, and 846 third class passengers.

In order to meet the special requirements of the case, special legislation was passed by the Dominion Parliament to enable a special board to be appointed to enquire into the circumstances of the disaster, and subsequently a board was appointed consisting of Lord Mersey, as Chairman; Chief Justice McLeod, of New Brunswick; and Sir Adolphe Routhier, of the Quebec Admiralty Court, with Capt. L. A. Demers, Dominion Wreck Commissioner; Commander Howe, of the Dominion Naval Department; Prof. John Welch, Naval Architect, Newcastle upon Tyne, Eng.; and F. W. Caborne, of the Royal Naval Reserve, as nautical assessors. The enquiry commenced at Quebec, June 16, and a large amount of evidence from all sides has been collected, on the main points of which there was considerable contradiction. Some diving operations have been undertaken, chiefly with the view of obtaining information regarding the position and condition of the wreck, and such operations are being continued, though it is realized that the task is a dangerous one, one diver having lost his life during the operations.

Capt. Donald, of the G.T. Pacific Coast Steamship Co.'s s.s. Prince George, was presented with a testimonial recently in recognition of his rescue of 38 passengers of a gasoline boat which was swamped during a storm along the northwest coast of British Columbia.

Atlantic and Pacific Ocean Marine.

Capt. Murray, R.N.R., has been appointed to the command of the C.P.R. s.s. Tyrolea, vice Capt. Carey retired.

The Allan Line s.s. Virginian has been chartered by the C.P.R. to take up the sailings of the s.s. Empress of Ireland, wrecked in the St. Lawrence, recently.

The C.P.R. steamship service between Canada and Trieste, Austria, having been discontinued, the steamships Tyrolea and Ruthenia will, during the current season, be run between Montreal and London.

Holt and Co., owners of the Blue Funnel Line, running to Vancouver and Victoria, B.C., are reported to have stated that it will be some time before their vessels will make Prince Rupert a port of call.

An order in council has been passed amending Montreal pilotage bylaw 45, by adding the following,—"For the pilotage of any vessel subject to pilotage, between Montreal and Quebec and vice versa, a minimum fee shall be charged of $20."

The Canada Line's s.s. Gothland ran on the rocks during a fog, off the Scilly Isles, England, June 24, and is believed to be a total wreck, as she grounded at high water in heavy weather. The whole of the passengers and crew were safely removed.

The C.P.R. Missanabie was launched at Glasgow, Scotland, June 22, the christening ceremony being performed by Mrs. G. McLaren Brown, wife of the European Manager, C.P.R., London. The Missanabie is for the Atlantic service, and will have accommodation for 520 second and 1,200 third class passengers.

Canadian Northern Steamships s.s. Royal Edward, while bound from Montreal to Avonmouth, towards the end of May, struck an iceberg about 110 miles east of Cape Race, while going dead slow during a fog. It was not considered that the damage was such as to prevent her from continuing her

List of Steam Vessels Registered in Canada During May, 1914.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134136	Aviso	Quebec, Que.	Sorel, Que	1914	54 7	14 6	7 0	52	22	13n.h.p. sc.	John Reid, Montreal.
136047	Galiano	Ottawa	Dublin, Ireland	1913	162 3	27 1	13 1	393	129	161 " "	Minister of Naval Service, Ottawa, Ont
134161	Glenlivet (a)	Midland, Ont	Cleveland, Ohio	1891	266 0	38 0	20 0	1860	1089	111 " "	Great Lakes Transportation Co., Midland, Ont.
129159	Gwennith	Ottawa, Ont	Alphen-on-Rhine, Holl'd	1910	85 4	18 1	9 1	119	3	50 " "	T. F. Malthy, 79 Mark Lane, London, Eng.
116815	Harry E. Packer	Cobourg, Ont.	Cleveland, Ohio	1882	227 6	35 4	17 1	1183	810	99 " "	G. Plunkett, Cobourg, Ont.
135209	Imperoyal	Sarnia, Ont	Grangemouth, Eng	1913	249 5	43 1	19 7	2253	1384	157 " "	Imperial Oil Co., Sarnia, Ont.
134327	J. W. Brankley	Chatham, N.B.	Chatham, N.B.	1914	64 0	16 0	7 0	61	19	16 " "	F. M. Tweedie, Chatham, N.B.
122615	Marlton	Goderich, Ont	Goderich, Ont	1914	62 0	16 0	8 8	64	43	24 " "	W. Marlton and W. L. Horton, Goderich, Ont.
130388	Pelee	Amherstburg, Ont.	Collingwood, Ont.	1914	146 0	24 1	9 9	538	243	58 " "	Windsor and Pelee Island Steamship Co., Pelee Island, Ont.
134135	Puncher	Quebec, Que.	Sorel, Que	1914	54 7	14 6	7 0	52	23	13 " "	John Reid, Montreal.
134134	Sir Lomer	Quebec, Que.	Portneuf, Que.	1912	59 5	15 4	7 0	48	18	23 " "	J. A. Lemay, Portneuf, Que.
134347	Stanstead (b)	Montreal	West Bay City, Mich.	1881	252 5	36 4	19 5	1549	970	98 " "	F. E. Hall, Montreal.
129767	Toiler	Kingston, Ont.	Newcastle-on-Tyne, Eng	1910	248 2	42 5	17 3	1659	1334	70 " "	James Playfair, Midland, Ont.
134196	Velma M.	Sault Ste. Marie	Buffalo, N.Y.	1872	57 0	11 0	6 0	31	13	10 " "	W. Lowery, M.O., Sault Ste. Marie, Ont.
134015	W. Grant Morden	Port Arthur, Ont.	Port Arthur, Ont.	1914	604 0	59 2	27 8	8973	6595	210 " "	Canadian Steamship Lines, Ltd., Montreal.
91255	William Iolliffe (c)	Victoria, B.C.	South Shields, Eng.	1885	149 0	26 2	14 0	332	58	150 " "	Canadian Pacific Railway, Montreal.

(a) Formerly Wawatam. (b) Formerly Cayuga. (c) Since changed to Nitinat.

List of Sailing Vessels and Barges Registered in Canada During May, 1914.

No.	Name	Port of Registry	Rig	Where and When Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
134213	Amy Turner	Prince Rupert	Bk	Boston, Mass.	1877	174 0	35 4	21 6	901	Granby Consolidated Mining, Smelting & Power Co., Vancouver, B.C.
134348	C.P.R. No. 100 (a)	Montreal	Barge	Farmingdale, Me.	1868	197 0	37 8	24 8	1237	Canadian Pacific Railway, Montreal
134088	Copper Queen	Vancouver, B.C.	Scow	Seattle, Wash.	1914	56 8	22 5	10 4	106	Granby Con. Min. & Smelt. Co., Grand Forks, B.C.
134089	Drill Boat Burrard	Vancouver	Scow	North Vancouver	1914	11550	30 0	7 8	426	Dominion Contracting Co., Vancouver, B.C.
78858	Dunure	Sydney, N.S.	Bktn	Troon, Scotland	1881	112 0	22 9	11 8	176	A. E. Hickman, St. John's, Nfld.
134344	Edgar B.	Montreal	Scow	Cardinal, Ont.	1905	75 2	20 5	4 2	168	General Contracting Co., Montreal.
133750	George A. Marsh	Toronto	Schr	Michigan City	1882	132 0	26 0	8 5	229	J. J. B. Flint, Belleville, Ont.
134197	L. S. No. 31	Sault Ste. Marie	Scow	Cleveland, Ohio	1876	105 0	28 0	8 0	377	S. L. Penhorwood, Sault Ste. Marie, Ont.
134182	N. G. & C. No. 3 (b)	St. John, N.B.	Dredge	Perth Amboy, N.J.	1894	120 6	55 3	8 6	1088	Norton Griffiths & Co., Ltd., Montreal.
134342	Norah L	Montreal	Scow	Montreal	1898	79 0	22 7	5 3	188	Quinlan & Robertson, Ltd., Montreal.
133749	R. M. & S. No. 14	Toronto	Scow	Toronto	1914	100 0	35 0	6 8	195	Roger Miller & Sons, Ltd., Toronto.

(a) Formerly Two Brothers. (b) Formerly No. 3.

voyage, which was completed in safety On arrival at Avonmouth she was docked for repairs, and her next sailing cancelled.

Capt. Carey, commander of the C.P.R. s.s. Tyrolea, has retired from active service, after 51 years service at sea. He commanded the C.P.R. s.s. Empress of Ireland, wrecked recently, during her first year of service, but was transferred back to the Tyrolea, then the Lake Erie, at his own request.

The Roth Line s.s. Coningsby, from Antwerp and Dundee to Montreal, put into St. John's, Nfld., on her way over, having sprung a leak in mid ocean. It was found that the stern glands were leaking badly. The damage was repaired and the vessel proceeded to Montreal, arriving there June 12.

The Marine Department announces that it has placed a green buoy showing oscillating white light, in 25 fathoms, about half a cable north of the wrecked s.s. Empress of Ireland; bearing from the buoy to Father Point light, south 54 deg., west distant 7 miles; vessel apparently lying on its side, least sounding 9½ fathoms low water.

The Norddeutscher Lloyd s.s. Hanover, which is being operated by the Canada Line, a subsidiary company, and which was at first reported to have collided with the s.s. Empress of Ireland, arrived at Montreal, May 31, inaugurating the second class passenger service for the company, between Montreal and continental ports in Europe. She is about 450 ft. long, 56 ft. draught, 6,000 tons register, and previously ran to Baltimore, Md. She has accommodation for 1,525 passengers.

On account of the close working arrangement between the C.P.R. and the Allan Line, it was reported from England that the latter's offices in Liverpool, were to be closed, during June, and the staff accommodated in the C.P.R. offices there. G. M. Bosworth, Vice President, C.P.R., was in England during June, when it was stated he dealt with the matter. The constantly recurring reports as to the absorption of the Allan Line by the C.P.R. have been previously dealt with in Canadian Railway and Marine World.

Maritime Provinces and Newfoundland.

The Dominion Government has included in the estimates for this year $20,000 for dredging in Charlottetown harbor, P.E.I.

Work on the ferry wharf at Cardigan P.E.I., for which $10,000 was recently appropriated by the Dominion Parliament, consists of the reconstruction of the present wharf, 315 ft. long, an extension of 40 ft., pier head 70 ft., and guide piers 90 ft.

Following are the officers and directors of the Miramichi Steam Navigation Co. for the current year,—President, Hon, J. P. Burchill; Vice President, J. D. Creaghan; other directors, R. Murray, John McDonald, W. B. Snowball, R. A. Snowball and J. D. B. F. McKenzie; Secretary-Treasurer and Manager, H. B. McDonald.

In connection with the recent revote in the Dominion Parliament of $24,000 for the construction of two piers at North Lake, P.E.I., the Minister of Public Works stated that delay had occurred in the carrying out of the work owing to the local farmers declining to grant the Government the usual releases from claims for possible damage to land.

Two steamships, especially built and equipped for the coal trade, have been ordered in Sunderland, Eng., for charter, under a 10 year agreement, to the Dominion Coal Co. They will be of the single deck type and built on the Isherwood system, with wing ballast tanks. Their dimensions will be, length 450 ft., breadth 58 ft., depth, moulded 33½ ft., and they will carry 11,000 tons on a 25 ft. draught.

The Marine Department announces that while the work on the extension of the Souris East breakwater, P.E.I., is in progress the portable light lantern on a pole at the outer end of the new work is liable to be extinguished or carried away by heavy seas, thus leaving the new work unguarded. All care will be taken to keep a continuous light, but mariners are cautioned to use care in entering at night.

The Dominion Government lightship 13, intended for service at Halifax, N.S., which was wrecked recently off the mouth of Liscomb harbor, about 120 miles east of Halifax, was built at Paisley, Scotland, and left the Clyde, Apr. 29, arriving at St. John's, Nfld., May 17, for coal. She left St. John's, May 19, and was expected to arrive at Halifax, May 22. None of the crew of 22 appears to have been saved, and little, if any knowledge, has been obtained as to the loss, which falls on the builders, who contracted to deliver the vessel at Halifax. She was built of steel throughout, classed 100 A1 at Lloyd's, and was of the following dimensions:—length over all, 135 ft. 9 ins.; length on water line, 114 ft.; beam moulded, 29 ft.; depth moulded, 14 ft. 8 ins.; draught, 12 ft. 9 ins.

At the usual monthly meeting of the St. John Board of Trade, June 1, the Secretary reported on the recent visit of C.P.R. officials to the port, and mentioned requests made by them as to betterment of accommodation there. They asked that the C.P.R. be allotted berths 2, 3 and 6, with 1, and its extension down the harbor, numbered 15, that the city keep all craft clear of the fairway approaching these wharves, and that the potato sheds on the so called C.P.R. wharves be made in fit condition for cargo, that the berths at West St. John be sounded for depths and a report sent to the C.P.R. Marine Superintendent at Montreal, that no craft be placed on the angle facing between berths 6 and 7 so that they may be kept clear at all times, and that all harbor tolls and other charges be made equivalent to those made at Halifax.

Province of Quebec Marine.

The curator of the Northern Transport Co., Montreal, insolvent, declared a first and final dividend recently, payable June 22.

J. B. E. Letellier, one of the Quebec Harbor Commissioners, is suing the Montreal Star for $10,000 damages for alleged libel, in connection with the purchase of ties, etc., for the Commission.

Capt. T. Bourassa, heretofore assistant harbor master, has been appointed harbor master, Montreal, vice Capt. L. A. Demers. reappointed Dominion Wreck Commissioner.

It is reported that during July a self contained grain barge will arrive at Quebec from Great Britain, for use in the harbor in loading grain on regular ocean going passenger vessels, without necessitating them leaving their berths.

The Quebec Harbor Commission dredge 551, which has been built in Great Britain, arrived at Quebec, June 12, having crossed the ocean under her own steam. The dredge is of the bucket type and is capable of removing 1,000 tons of material an hour.

From the commencement of navigation to June 16, 16,790,961 bush. of grain were received in store at the Montreal Harbor Commissioners' elevators. Of this about 14,000,000 bush. arrived by the water route and the balance by rail.

Capt. T. Bourassa, heretofore deputy harbor master, has been appointed harbor master, at Montreal, vice Capt. L. A. Demers, reappointed Dominion Wreck Commissioner. Capt. Symons, Lieutenant R. N. R., has been appointed deputy harbor master.

Canada Steamship Lines' new ferry steamboat for the Montreal-Longueuil service is expected to be ready for service towards the end of July. She is an iron vessel, 170 ft. long and 43 ft. broad over guards. She will have passenger accommodation for about 1,000.

Canada Steamship Lines s.s. Berthier was burned, and sank at her moorings alongside Victoria Pier, Montreal, May 25. She was built at Sorel, Que., in 1870, and was paddle wheel driven by engine of 43 n.h.p. Her dimensions were, length 184.2 ft.,

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during May.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	423	7,872	8,295
Grain	"	Bushels	7,816,880	5,307,940	13,124,820
Building stone	"	Short tons	.....	.....	.....
Flour	"	Barrels	216,350	1 044,552	1,260,902
Iron ore	"	Short tons	2,631,365	1,104,219	3,735,584
Pig iron	"	"	2,200	2,128	4,328
Lumber	"	M. ft. b.m	2,439	67,926	70,365
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	21,179,416	5,579,117	26,758,533
General merchandise	"	Short tons	10,890	38,852	49,742
Passengers	"	Number	427	500	927
Coal, hard	Westbound	Short tons	59,641	189,053	248,694
Coal, soft	"	"	362,680	1,540,745	1,903,425
Flour	"	Barrels	.....	367	367
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	8,736	43,406	52,172
Iron ore	"	"	.....	.....	.....
Salt	"	Barrels	29,064	200,845	229,909
General merchandise	"	Short tons	50,836	99,518	150,354
Passengers	"	Number	748	313	1,061
Summary.					
Vessel passages		Number	943	1,684	2,627
Registered tonnage		Net	2,467,707	3,288,186	5 755,893
Freight—Eastbound		Short tons	3,453,966	1,645,191	5,099,157
" —Westbound		"	486,075	1,902,884	2,388,959
Total freight		"	3,940,041	3,548,075	7,488,116

breadth 28.1 ft., depth 8.6 ft.; tonnage, 934 gross, 439 register.

Atlas Shipping Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital, and office at Montreal, to own and operate steam and other vessels, and to carry on a general navigation business throughout the Dominion and elsewhere. The incorporators are, E. E. Howard, J. DeWitt, H. C. McNeil, W. H. Howard, Montreal, and O. S. Tyndale, Westmount, Que.

The s.s. Rhoda, owned in Montreal, which was being operated between Montreal and La Prairie, is aground about a mile below La Prairie. At the time of writing, no effort was being made to release her. She was built at Levis, Que., in 1874, and is paddle wheel driven by engine of 34 n.h.p. Her dimensions are, length 131.5 ft., breadth 23 ft., depth 10 ft.; tonnage, 310 gross, 167 register.

The Public Works Department has completed dredging in the Ottawa River, from about half a mile above Green Creek to about a quarter of a mile below Kettle Island, in order to obtain a depth of 12 ft. at ordinary low water, with a minimum width of 205 ft. The dredged portion of the channel is aligned between a beacon on the south shore above Green Creek and a beacon on the lower extremity of Kettle Island.

Davie Shipbuilding and Repairing Co., Ltd., has been incorporated under the Dominion Companies Act, with $500,000 capital and office at Lauzon, Que., to take over the business of G. T. Davie and Son, Lauzon, Que., and to continue and extend same as a general ship building and repairing business. The incorporators are, G. D. Davie, A. C. Davie, Lauzon, Que., T. A. O'Neill, J. P. A. Gravel and A. C. M. Thompson, Quebec, Que.

The new elevator at Quebec, controlled by the Harbor Commissioners, was put into service June 9, when the Quebec Transportation and Forwarding Co.'s barge Zapotic discharged its cargo of 85,000 bush., taken from Port Colborne. The elevator has two marine legs, each capable of discharging 15,000 bush. an hour. The Harbor Commissioners are erecting a new conveyor system to connect the old elevator with the Louise dock.

The report called for by the Montreal Board of Control, respecting the proposed municipal ferry service to St. Helens Island, recommends the construction of three steel, fireproof ferry boats, costing about $60,000 each, the building of three landing places on the Montreal side, one at the foot of McGill St., one opposite the centre of the city at the present landing place, and the third in the east end. The contract for the present service expires this year.

The Montreal Board of Control has been advised to drop its appeal in connection with the taxation of the Montreal Harbor Commissioners' property, on the ground that it is Government property, and therefore not taxable by the municipality. A bill has recently been passed declaring that the property vested in the Commission is to be deemed Government property, and that it always has been so, and authorizing the Commissioners to transfer same to the Government formally.

The Montreal Harbor Commissioners Act has been amended by providing that notwithstanding anything in that act, or any other act respecting the Montreal Harbor Commissioners, the harbor of Montreal and all property connected therewith, is vested in the Dominion Government, and shall be deemed always to have been so since July 1, 1867, and the Commissioners are empowered to transfer such property to the Government, such transfer, however, not to affect the Commissioners' jurisdiction.

Ontario and the Great Lakes.

The Chatham Navigation Co. has appointed T. J. Stockwell as captain, and E. P. Williams, as chief engineer, of its s.s. Ossifrage.

The name of the s.s. Prince Rupert, registered at Kingston, Ont., official number 124260, under the name of the Kingston Shipping Co., has been changed to Northmount.

The Department of Railways and Canals received tenders to June 26 for the construction of a stone protection on the summit level on the Welland Ship Canal, between Thorold and Port Colborne.

The dredge Delver, owned by the Dominion Dredging Co., contractors for section 1 of the Welland Ship Canal, capsized in a heavy sea near Port Dalhousie, June 15, and sank. Nine of the crew of ten were rescued.

The Pere Marquette Rd. car ferry steamer Marquette and Bessemer no. 2, which was lost in a storm on Lake Erie, in Nov., 1911, has been discovered about 10 miles south of Erieau. It is said that an attempt will be made to raise her.

The Department of Railways and Canals received tenders to June 18, for the construction of sec. 3, Seven Division, Trent Valley Canal. The section lies between Peterboro and Lake Simcoe. It is estimated that the cost will approximate $1,500,000.

Canada Steamship Lines, Ltd., has purchased Grimsby Beach Park, between Hamilton and St. Catharines, Ont., for, it is said, $130,000. A pleasure park will be operated in conjunction with a line of steamboats from the chief centres in the vicinity.

D. J. Bourke has been appointed Traffic Manager, Great Lakes Transportation Co., Windsor, Ont. This is the company recently formed, in which J. Playfair, Midland, and H. W. Richardson, Kingston, are chiefly interested, and of which the former is President.

The Rainy River Navigation Co. commenced its season on the Rainy River and the Lake of the Woods, June 16, with the steamships Keenora and Agwinde. The service will be tri-weekly, with calling places at Kenora, Warroad, Rainy River and Fort Frances.

The Canadian Sand and Gravel Co., Ltd., has been incorporated under the Ontario Companies Act, with $100,000 capital and office at Thorold, to deal in sand and gravel, and to own and operate steam and other vessels. The provisional directors are: J. Battle, W. M. German, M. Battle, D. B. Page and C. Freel, Thorold, Ont.

The Mathews Steamship Co.'s s.s. Steelton arrived at Toronto, from England, during June. She is a sister vessel of the company's steamships Easton and Yorkton, and will be engaged in the Upper Lakes service. She was built at Sunderland, and on her recent trials male 11¼ knots an hour. She is of full Welland Canal size, with doubel bottom, and is rated 100 A1 at Lloyd's.

The U. S. Lake Survey s.s. Surveyor, engaged in surveys and examinations in the east end of Lake Ontario, recently reported the discovery of a small rock shoal with least depth of 16 ft., about 4 11-16 miles from Stony Point lighthouse, and 4 miles from Galloo Island lighthouse. It is about 4,500 ft. south and 400 ft. west of Calf Island Spit black can buoy, and is nearly on the sailing course between Charlotte and Sackett's Harbor. At extreme low water, the depth of water is only 12 ft.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater for May, as follows,—Superior 602.33; Michigan and Huron 580.32; Erie 572.91; Ontario 256.95. As compared with the average May levels for the past ten years, Superior was 0.35 ft. above; Michigan and Huron 0.46 ft. below; Erie 0.06 ft. above, and Ontario 0.02 ft. below. It was anticipated that during June, Superior, Michigan and Huron would rise 0.3 ft., and Erie and Ontario 0.2 ft.

The St. Lawrence and Chicago Steam Navigation Co.'s s.s. J. H. G. Hagarty, which has been built at Collingwood to replace the s.s. James Carruthers, lost in the great storm on the lakes towards the end of last year, was launched June 18. She is practically the same as the lost vessel in construction. She is 550 ft. long, 58 ft. broad and 31 ft. deep, with hatches spaced 24 ft. apart instead of 12 ft. as on the James Carruthers. It is expected that she will be ready for her maiden trip about July 8.

The Algoma Central Steamship Line is reported to have purchased the s.s. E. D. Carter, from E. D. Carter, Erie, Pa. She is a steel vessel built at Wyandotte, Mich., in 1906, of the following dimensions,—length 504 ft., breadth 54 ft., depth 30 ft.; tonnage, 6,359 gross, 5,063 register. She is equipped with triple expansion engines with cylinders 22½, 36 and 60 ins. diar., by 42 in. stroke, 1,600 i.h.p., 80 r.p.m., supplied with steam by 2 Scotch boilers fitted with induced draught, 13¾ ft. diar., by 11½ ft. long, at a working pressure of 180 lbs.

The Great Lakes and Atlantic Canal and Power Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital and office at Montreal, to make surveys, etc., subject to the permission of owners of land, to take soundings, and obtain general data for the location and construction and improvement of canals, lakes, rivers, water courses, etc.; to own and operate steam and other vessels, dry docks, shipbuilding plants, etc., and for other purposes. The incorporators are: E. A. D. Morgan, G. A. Morrison, H. S. M. Caron, C. A. Hetu and L. J. Lefebvre, Montreal.

The New York Court of Appeals has held the repeal of the act granting certain water rights on the St. Lawrence River, to the Long Sault Development Co., to be effective. This company was organized in 1907, for the development of water powers at the Long Sault Rapids. The granting of the rights by the New York Legislature was strongly opposed by the Shipping Federation of Canada, the Dominion Marine Association, and other marine organizations, as tending to interfere with shipping generally. The act granting the rights was repealed in 1913, and the company appealed against the repeal.

Manitoba, Saskatchewan and Alberta.

The Peace River Transportation Co. has placed its first vessel in service between Athabasca Landing and Grouard, Alta. J. K. Cornwall, Royal Bank Bldg., Edmonton, is President.

The sternwheel steamboat City of Edmonton, owned by John Walters and Co., which is used for pleasure purposes upon the North Saskatchewan River, struck a snag recently but was beached at the shore, and the 500 passengers were safely transferred to the steamboat City of Strathcona.

The Dominion Parliament has voted $14,600 for improvement of navigation in the Assiniboine River. The Minister of Public Works stated that the amount will be spent in removing obstructions such as rapids, rocks, etc., from the channel. Since the building of the St. Andrews locks, he announced, the water in the Red River has backed up considerably, and consequently there is now a fair amount of navigation on the Assiniboine.

British Columbia and Pacific Coast Marine.

The Governor in Council has approved of the Vancouver Harbor Commissioners' by-laws, 1 to 112.

F. O. White has been appointed Lloyd's agent at Victoria, under the jurisdiction of C. Gardiner Johnson, agent for British Columbia.

Application is being made to the Governor in council for approval of area, plans, site and description of works to be constructed in Victoria harbor upper basin.

The Pacific Coast Steamship Co.'s s.s. President inaugurated that company's service between Seattle, Wash., and Victoria, June 12, leaving later for San Francisco and other southern ports.

The Dominion Government will shortly call for tenders for the construction of a dry dock at Esquimalt, B.C. The dock is to be 1,100 ft. long, and will, in the main, be a duplicate of the one under construction at Lauzon, Que.

The C.P.R. s.s. Princess Margaret, intended for the British Columbia Coast service, was launched at Dumbarton, Scotland, June 24. The christening was performed by Mrs. R. Redmond, daughter of Sir Thomas Shaughnessy, President, C.P.R., who was presented with a platinum necklet by the builders.

The Grand Trunk Pacific Coast Steamship Co., commencing June 1, rearranged the schedule for its vessels. The Prince Rupert now continues to Stewart, making the Granby Bay call, and the Prince George, which hitherto performed the Stewart service, alternately with the Prince John, runs to Granby Bay only.

The contractors for the harbor development works at Ogden Point, Victoria harbor, Grant, Smith and Co., and MacDonnell, have chartered a floating dry dock from the Seattle Dry Dock and Construction Co., for use in building the piers, etc. The dock was towed from Seattle, Wash., to Victoria, by the C.P.R. steam tug William Joliffe.

The work of preparing the site for the Marine Department s depot on the Songhees Reserve, near Victoria will, it is expected, be completed by the end of July. Approximately 27,000 cubic yards of material were to be removed, and a wharf 650 ft. long will be built. Both sections of this work are being carried on simultaneously. Parks, Tupper and Kirkpatrick are the contractors.

Terminal Steam Navigation Co., Ltd., which was reported in our last issue to have purchased the s.s. Joan from the C.P.R., was incorporated in 1908 to take over the Terminal Steamship Co. Three vessels are operated, the Baramba, formerly R. P. Rithet, Brittania and Bowena. The company has a capital stock of $200,000. The officers are, President, Capt, J. A. Gates; Secretary-Treasurer and Manager, S. L. Johnson, Vancouver.

A. D. Swan, M. Can. Soc. C. E., sailed from Montreal early in June for England, where it is reported that he is giving expert evidence in a lawsuit there, on behalf of the Bristol Docks Committee. While in England, it is stated that he will, as consulting engineer to the Vancouver Harbor Commissioners, complete negotiations for the construction of the graving dock at Vancouver, plans for which have already been approved by the Dominion Government.

The B. C. Express Co., which operates vessels on the Fraser River, recently applied to the Supreme Court at Vancouver, for the removal of one bridge and the alteration of two others, which the G.T. Pacific Ry. had built across the upper Fraser River near Fort George. The application was dismissed with costs, on the ground that the construction of the bridges was sanctioned by the Government departments concerned, and that, from the evidence submitted, the company's business was not jeopardized. The judge pointed out that the application should have been made to the Board of Railway Commissioners, which has all jurisdiction over such matters, and if the business had suffered damage, an action could have been entered in the proper court.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

157. May 7. British Columbia, Strait of Georgia, sandheads of Fraser River, lightship to be removed temporarily for repairs.

158. May 7. British Columbia, Strait of Georgia, Burrard Inlet, submarine bell buoy moored near Grey Point gas and bell buoy.

159. May 7. British Columbia, Strait of Georgia, Algerine Passage, Rebecca Rock, gas lighted beacon established.

160. May 8. Nova Scotia, south coast, Halifax harbor entrance, Sambro outer bank, light ship replaced by gas and whistling buoy.

161. May 8. New Brunswick, north coast, Chaleur Bay, Grande Anse, buoyage.

162. May 12. Quebec, River St. Lawrence, Lake St. Francis, off Knight Point, buoys established.

163. May 12. Quebec, River St. Lawrence, Lake St. Francis, Cherry Island, light discontinued.

164. May 12. Ontario, Lake Ontario, Port Dalhousie, Welland Canal entrance, emergency fog alarm.

165. May 12. Ontario, Georgian Bay, Wingfield basin, range lights established.

166. May 12. Ontario, Lake Huron, north channel, Killarney west, light improved.

167. May 12. Ontario, River St. Mary, Vidal shoals, gas buoy not to be established; spar buoy to be established.

168. May 13. British Columbia, Vancouver Island, east coast, Sidney, light established.

169. May 13. British Columbia, Strait of Georgia, approach to Nanaimo, Snake Island reef, bell buoy adrift.

170. May 15. Nova Scotia, south coast, Port Felix harbor, Hog Island, hand fog horn at light station.

171. May 15. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, Lake St. Peter, curve no. 2, gas buoy established, spar buoy discontinued.

172. May 19. Prince Edward Island, east coast, extension to Souris East breakwater, temporary light liable not to be exhibited during gales, caution.

173. May 19. Quebec, River St. Lawrence, Batiscan anchorage, buoys changed in position.

174. May 22. Ontario, River St. Lawrence, Glengarry Point, gas buoy established.

175. May 22. Ontario, Lake Ontario, Toronto harbor approaches, buoyage.

176. May 22. Ontario, Georgian Bay, Meaford, new tower for breakwater light, new illuminating apparatus.

177. May 28. British Columbia, Burrard Inlet, Vancouver harbor, Burnaby Shoal, beacon light and fog bell established.

178. May 28. British Columbia, Cordero channel, southward of Erasmus Islands, Crawford anchorage, uncharted rock.

179. May 28. British Columbia, Queen Charlotte Sound, Pine Island, change in character of light.

180. June 1. Maritime Provinces and Quebec, Canadian list of lights and fog signals, new edition.

181. June 1. Nova Scotia, south coast, Halifax harbor entrance, Sambro outer bank, submarine bell buoy placed northward of gas and whistling buoy.

182. June 1. Prince Edward Island, north coast, Cascumpeque harbor, Alberton, change in position of range lights.

183. June 5. Quebec, River St. Lawrence, below Father Point, wreck of s.s. Empress of Ireland marked by gas buoy.

184. June 5. Quebec, River St. Lawrence, off Metis Point, submarine bell buoy established.

Another Accident to Lock Gates on the Welland Canal.

The numerous accidents in the Welland Canal of recent years, by which lock gates have been carried away, and in some cases, extensive damage done to the canal banks, to vessels and to the adjacent lands, seem to call for some different method of handling vessels while locking through. The adoption of a safety locking device to the gates is claimed to have proved successful in preventing gates from being forced by the rush of a volume of water from higher levels, but there still remains the question of vessels entering the locks with too great a way on them, in some cases caused through jockeying for position when several vessels are waiting to be locked through. There is also some evident carelessness in the handling of ropes, all of which should, on being established by strict enquiry into all the circumstances attending such accidents, tend to the forming of some strict regulations, properly enforced, for the handling of vessels through locks.

The accident happened June 10, about 4.15 p.m., when Canada Cement Transport's s.s. Pueblo, loaded with coal, downbound, through a misunderstanding of signals, it is said, struck and carried out the foot gates of lock 9. These were torn from their fastenings, and in addition, the two upper gates of the lock were carried out by the rush of water from the level above. The Pueblo was carried with the surge into the level below, a short one, striking and damaging the two head gates of lock 8, which were partly open, one of which had to be replaced by a spare one. The two head gates of lock 9 were badly broken and jammed together near the head of the lock. In addition, large stones, forming the course of the breast wall at the head of lock 9, were lifted bodily by the force of the water and deposited just above the upper recess, the removal of which necessitated the complete unwatering of the level. The lift at both locks is 12 ft., the level above lock 9 is about 2,300 ft. long, the flood water overflowing, however, did little damage to the surrounding fields, though the banks were considerably cut out at lock 8. The damage is estimated at about $10,000. Spare gates were placed, the damaged one repaired, and navigation resumed about 11.30 a.m., June 13.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Hughton, Pinkham and Wiseton, Sask., and at Richdale, Alta.

Application was made to the Board of Railway Commissioners, June 26, for the extension of the express delivery and collection limits in Winnipeg.

The Board of Railway Commissioners has ordered the Dominion Ex. Co. to file a special tariff applicable to through shipments of milk or cream to Boston, Mass.

The Canadian Ex. Co. is being proceeded agalnst in Moncton, N. B., for alleged violation of the Canada Temperance Act, in handling intoxicating liquor in prohibition areas.

The Board of Railway Commissioners has ordered the Canadian Northern Ex. Co. to file joint tariffs showing express rates on fruit and vegetables from its shipping point in Prince Edward County, Ont., to points beyond or via Smiths Falls, reached jointly by it, and Canadian, or Dominion Ex. Cos. that shall not exceed rates on said commodities published by Canadian and Dominion Ex. Cos. from Niagara district to same points.

The United States Express Co. ceased buslness June 30, in pursuance of the resolution of the directors at a special meeting called for that purpose, Mar. 13. The company was a joint stock association, the members of which each had full partnership liability for the company's obligations. It was organized Apr. 22, 1854, for 10 years, and for further periods at various dates, the last extension being for 20 years from May 1, 1904. As stated, the company ceased doing business on June 30, as a public carrier, but it will take several years before its affairs can be liquidated and its assets distributed. The President of the company is D. I. Roberts, who was appointed Jan. 1, 1913, having been, prior to that date, General Manager, Quebec, Montreal and Southern Ry., and Napierville Jct. Ry., Montreal.

Telegraph, Telephone and Cable Matters.

The Canadian Northern Telegraph Co. has opened offices at Pinkham and Wiseton, Sask., and at Richdale, Alta.

The Royal Society of Arts, it is announced, will award the Albert Medal for the current year to W. Marconi, for his services in the development and practical application of wireless telegraphy.

It is reported that the C. P. R., owing to increase in business, has leased the Okanagan Telephone Co.'s line between Vernon and Kelowna, B. C., pending the erection of a new line south from Vernon along the Okanagan Lake shore to Penticton.

The Great North Western Telegraph Co. has opened offices at Beaumaris, Cardinal Point, Charing Cross, Milford Bay, Petawawa Camp, Port Cockburn and Rosseau, Ont., Abenakis Springs Hotel, Chaudiere Basin, Little Metis Lighthouse and Riviere Ouelle Wharf, Que., and has changed the name of its office at Beaurivage, Que., to St. Florence.

The C.P.R. Telegraph Department has opened offices at Keith and Retlaw, Alta.; Cedar Creek and Malakwa, B.C.; Barkers, Colters, Minto, Newcastle and Rippies, N.B.; Port Hawkesbury, N.S.; Ingersoll Jct., Kenilworth, Levak, Nestorville, Petewawa military camp, Ont.; Cadillac, Java, Meyronne, Notokou, Pontlex, Prelate, Regina Beach and Sceptre, Sask.; and has closed its offices at Keoma, Pearce, Seebe, Spring Coulee and Whitla, Alta.; Whonnock, B.C.; Antigonish, N.S.; Eldon, Folger, Kama, Lochalsh, Middleton, Ramsay, and Trudeau, Ont.; Baring, Belbeck, Biggar, Blucher, Chandler, Crane Lake, Cross, Kedleston, Primate and Tregarva, Sask.

The C.P.R. Telegraph Department has issued the following notice to its operating staff,—"From an analysis of error statements it is shown that the majority of errors made are the result of indifference or thoughtless mechanical work. Palpable and preventible errors are underscored by the receiving operator on the assurance of the sending operator that it is according to copy; the underscore of the receiving operator becomes a confirmation of the error which goes through without further question to the addressee, often to his annoyance and always to the company's injury. The value of the simplest action depends upon the amount of thought put into it, and the large volume of business handled by the telegraph companies, and the small percentage of errors is a great compliment to the intelligence of the telegrapher and the thoughtful care most men put into their work, but as a chain is no stronger than its weakest link, the poor work of the few throws discredit on the good work of the many, and therefore it behooves all who take an interest in themselves and the company to prevent whenever and wherever possible the perpetration of errors. It is therefore ordered that operators will in future refer errors or doubtful words that cannot be corrected between themselves, to the chief operator, or traffice chief, who, if the correction cannot be made without undue delay, will forward the message subject to correction and service the office of origin for confirmation of the word in question. Operators who allow errors or doubtful words to pass, that might have been corrected, will have such cases charged against their record, and where such lapses are repeated, the local management shall apply the proper remedy to protect the good name of the company as well as that of its employes.

Association of Railway Telegraph Superintendents.

At the annual convention at New Orleans, La., recently R. G. Gage, Signal and Electrical Engineer, Canadian Government Railways, Moncton, N.B., J. McMillan, General Superintendent of Telegraphs, Western Lines, C. P. R., Winnipeg, and W. J. Kelly, Superintendent of Telegraphs and Telephones, Timiskaming and Northern Ontario Ry., North Bay, Ont., were among the new members elected, while in addition, the following were present from Canada, W. J. Camp, Assistant Manager of Telegraphs, C. P.R., Montreal, D. Coons, Superintendent of Telegraphs, Saskatchewan Division, C.P.R., Moose Jaw, and T. Rodger, Inspector of Telegraphs and Telephones, G.T.R. Papers were read and discussed on the following subjects,—unit cost of railway pole line construction and repairs, organization of gangs including plans for boarding the men, the fitting of applicants for telegraph and telephone service on railroads, organization of forces for restoring wire service interrupted by storms, wireless telegraphy in railroad service, physical and phantom transpositions, the printing telegraph, and the maintenance of telephone and telegraph equipment.

In the discussions on the various papers, W. J. Camp and J. McMillan took part, favoring the use of boarding cars against boarding houses for the use of gangs, the men themselves preferring them, and also on account of the difficulties in finding boarding houses in the immediate vicinity of the job in hand.

On the matter of utilizing telegraph linemen on telephone line maintenance, the Canadian representatives gave their experiences, and described the training given to the telegraph men to enable them to take care of the telephone equipment also.

In a discussion on a paper relating to the organization of forces for restoring wire service interrupted by storms, W. J. Camp stated that he found that the best results were achieved by using single or twin wires, and as to the strengthening of the poles, he pointed out that that would necessitate the strengthening of the crossarm, all of which would make construction much more expensive. He explained the methods used on the C.P.R. for supplying operators, and commented favorably on the refusal of the Board of Railway Commissioners to raise the age of employment from 18 to 21. In discussing the use of the printer telegraph on railways, he said that on the C.P.R. various systems of printing telegraph had been tried with satisfactory results, and described the two printer circuits now being operated between Montreal and Toronto, and those between Montreal and Quebec and Montreal and Ottawa.

The 1915 convention will be held at Rochester, N.Y., from May 22 to 25, inclusive. Following are the officers for the current year,—President, W. C. Walstrum, Superintendent Telegraphs, Norfolk and Western Ry., Roanoke, Va.; First Vice President, E. C. Keenan, Superintendent Telegraphs, New York Central Lines, Chicago, Ill.; Second Vice President, L. S. Wells, Superintendent Telegraphs, Long Island Rd., New York; Secretary-Treasurer, P. W. Drew (since 1882), Superintendent Telegraphs, Minneapolis, St. Paul and Sault Ste. Marie Ry., Chicago, Ill.; Chairman Eastern Division, H. Potter, Superintendent of Telegraphs, Southern Ry., Washington, D.C.; Chairman Western Division, M. A. Clapp, Superintendent Telegraph, Northern Pacific Ry., St. Paul, Minn.

Book Reviews.

Any of the books reviewed may be obtained through Canadian Railway and Marine World at the published price.

THE GREAT LAKES RED BOOK. 143 pages, 4¾ by 3 ins., paper. Penton Publishing Co., Cleveland, Ohio. $1.

This handy pocket size booklet contains the names of over 1,000 vessels operating on the Great Lakes, with the names of owners, captain and chief engineer in each case, for the current season. The names of the vessels are listed alphabetically and each bears a fleet number, under which the whole of the owning company's vessels, with the foregoing information, appears

MARINE DIRECTORY OF THE GREAT LAKES. 484 pages, 6 by 9 ins., cloth. Mitchell and Co., Cleveland, Ohio. $5 net.

This book is compiled with the idea of giving to all interested in shipping, complete information covering vessels, ore and coal docks, grain elevators, etc., on the Great Lakes. The information concerning the various vessels seems to be fairly complete, and it is arranged in convenient manner for quick reference. In addition to the general information concerning vessels, there are a number of historical facts concerning the Great Lakes, from their discovery to the present time, and descriptions of the various connecting waterways and canals, both Canadian and U. S., with charts of the various harbors. The book is well illustrated with a number of the best types of passenger and freight vessels on the lakes.

THE ENGINEERING MANUAL, 6 by 9 ins., 1½ ins. thick in loose leaf cloth binder. American Electric Railway Engineering Association, New York, N.Y. Price $3. Binder $1. Members of Association receive it free without binder.

This is a compilation of the standards and recommendations adopted by this Association and covers practically the entire field of electric railway engineering. It is in loose leaf form, and consists of 82 sections, fully illustrated with diagrams and working drawings. The loose leaf form has been adopted in order that the standards and recommendations may keep pace with such additions and alterations as are made at the Association's yearly conventions. Separate sections may be obtained.

SUPLEE'S MECHANICAL ENGINEERS' Reference Book.—By H. S. Suplee, B.Sc.; M.E. 964 pages; 4½ by 6½ ins.; illustrated. Published by J. B. Lippincott Co., Philadelphia, Pa.

The fourth edition of this handbook, originally published in 1903, has had the few errors appearing in the previous edition corrected, and a 40 page appendix added. Practically every branch of mechanical engineering has been collected in this book, and indexed in a very convenient manner, making it particularly handy for ready reference. The chief feature of value lies in the manner in which the data, secured from numerous sources, has been collaborated, and the essential information boiled down into small compass, so that it is not necessary to wade through a series of unrelated tests, as is common in many books of its type, to secure the data desired. As far as has been found practicable the information appears in tabular form, and where this has not been feasible, simple formulae, the factors in which are in intelligible form, are used. Each separate subject is developed in a concise manner from the fundamental considerations, so that where the tables and data are not readily understood from an unfamiliarity with the subject in hand, the development of the data can be easily followed if even a fundamental knowledge of engineering is possessed by the user. The edge of the book is indexed under the following main sections: Mathematics, mechanics, material of engineering, strength of materials, machine design, air, water, fuel, steam, steam boilers, steam engines, internal combustion engines, electric power, cost of power, and miscellaneous. These several heads are subdivided in the table of contents so that any general group can be readily located and the details are further subdivided in a complete index at the back, wherein are over 4,000 headings. The index is one of the particular features in which most books of this type are weak, but in this instance, it appears to have been prepared with great care, so that data on a very wide range of topics can be quickly located. A great many authorities for the information contained, are referred to, giving a clue to where more exhaustive information may be obtained.

R. P. Lewis, Traffic Supervisor, City of Winnipeg, Street Railway Department, writes, "I would be much obliged if you would place me on your subscription list for Canadian Railway and Marine World, as I think I will find the same a great asset to help me to carry out my duties."

The North Pacific Coast Passenger Association held its regular monthly session at the Empress Hotel, Victoria, B.C., June 16, H. W. Brodie, General Passenger Agent, C.P.R., Vancouver, presiding.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Dearborn Chemical Co. of Canada, Ltd., Toronto, has appointed Jno. F. Franey, Western Manager, at Winnipeg.

The Lauzon Engineering Co., Ltd., engineers and contractors, Levis, Que., have been awarded a contract by the Levis City Council for paving Laurier Ave. and Commercial St., with medal vitrified paving block.

Canadian Allis-Chalmers, Ltd., Toronto, is distributing a booklet, "Pile Hammers," issued by McKiernan-Terry Drill Co., describing and illustrating pile hammers for contractors' use in driving wood sheathing, steel sheet piling and concrete piles.

The Titanium Alloy Mfg. Co., Niagara Falls, N.Y., has issued "Rail Reports Bulletin 6, Open Hearth," giving results of tests made on six pieces of rails, three of standard and three of Titanium treated open hearth rails rolled in Sept., 1913, for an eastern U. S. railway.

Brown Hoisting Machinery Co., Cleveland Ohio.—J. P. Case, who has been appointed Canadian representative, succeeding F. A. Peck, resigned, has been with the Brown Hoisting Machinery Co. for a good many years. He will spend all his time in Canada, and will be assisted by Hoyt E. Hayes, who has also had a practical experience in the material handling field.

United States Light & Heating Co.—L. R. Pomeroy, a railway and electrical engineer, has been appointed Manager of the New York sales office, 16-24 W. 61st St., of The U. S. Light & Heating Co., the general offices of which are now at Niagara Falls, N.Y. Mr. Pomeroy has under his direction the sales of the U-S-L axle electric car lighting equipment, U-S-L electric starter and lighter, and U-S-L storage batteries, in the territory of the New York branch office.

Canada Machinery Corporation, Ltd.—In connection with the new financing carried out by this company recently, whereby $150,000 additional working capital was provided by the shareholders, certain changes in the management have taken place through the retirement of T. F. Kenny as General Manager, and in future T. H. Watson, the newly elected President, will assume the duties heretofore performed by the General Manager, and take an active part in directing the company's affairs.

The Detroit Lubricator Company will exhibit the new Detroit flange lubricator at the General Foremens' Convention at Chicago. The exhibit will consist of two wooden models of 45 degree sections of locomotive drivers with the lubricator installed in the same manner as in actual service. The whole apparatus will be rocked back and forth by an ingenious electrical contrivance to approximate working conditions on the road. The lubricator will feed oil on the flanges every time the lateral motion becomes pronounced, and easy observation of its construction and operation will be made possible by removing sections to display the internal mechanism. In addition to this a No. 22 bullseye locomotive lubricator, air cylinder lubricator and transfer filler will be shown in operation. A complete line of locomotive lubricators, with from one to eight feeds, automatic steam chest plugs, air cylinder lubricators, transfer fillers, with sectional models and cross sections of parts will be displayed.

Transportation Conventions in 1914.

July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
July 20-22.—American Railway Tool Foremen's Association, Chicago, Ill.
Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.
Aug. 20, 21.—American Association of Railroad Superintendents, New York.
Sept. 1-4.—American Boiler Manufacturers' Association, New York.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Nashville, Tenn.
Sept. 22-24.—Railway Signal Association Bluff Point, N.Y.
Oct. —.—American Association of Dining Car Superintendents, Washington, D.C.
Oct. 12-16.—American Electric Railway Association, Atlantic City, N. J.
Oct. 19-23.—Association of Railway Electrical Engineers, Chicago, Ill.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, A. F. Dion, Quebec.
Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.
Western Canada Railway Club, W. H. Rosevear, 25½ Princess St., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.

The McEachern Tie and Timber Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital, and office at Thessalon, to carry on a general timber business, and to act as shipowners and carries by sea, etc. E. S., and H. S. Perryman, Chicago, Ill.; J. A., and M. T. McEachern, and W. McGuire, Thessalon, are the incorporators.

Consolidated Railway Act.—The Government bill providing for the consolidation and amendment of the Railway Act, which was referred to a dual committee of the Senate and the House of Commons, did not get beyond that stage last session of Parliament It will be proceeded with next session.

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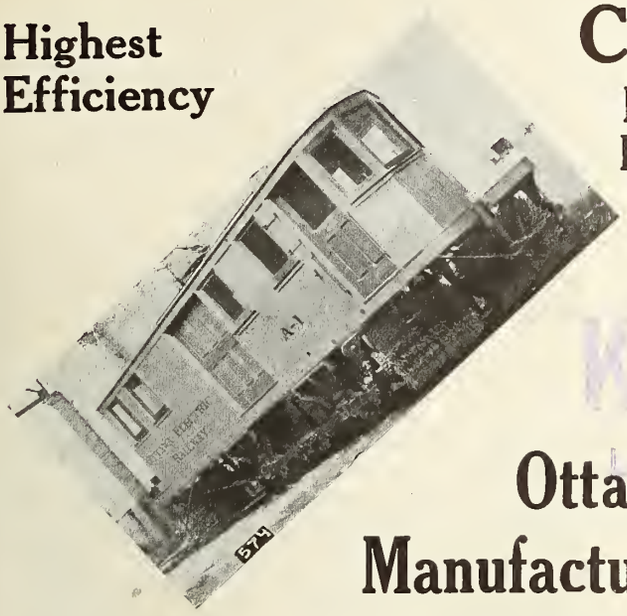

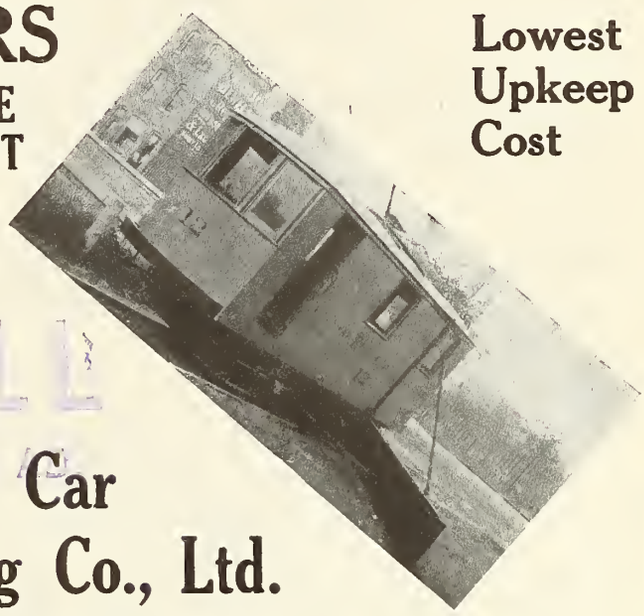

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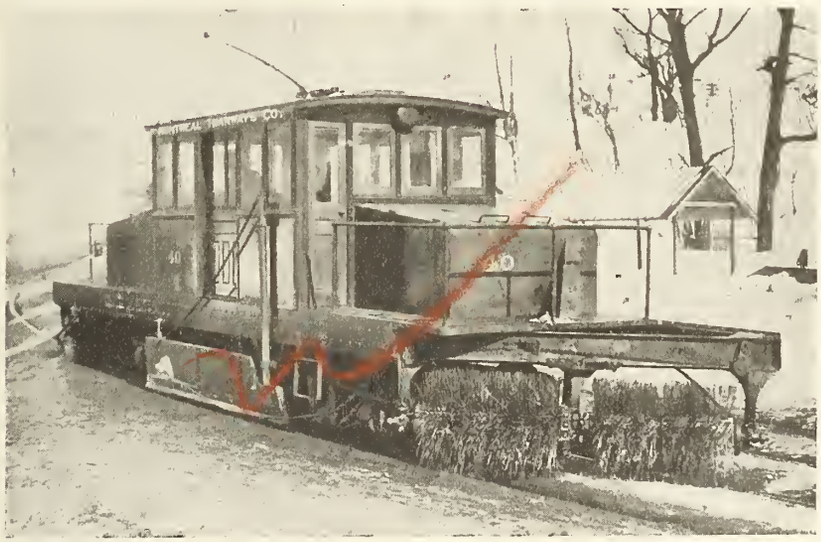

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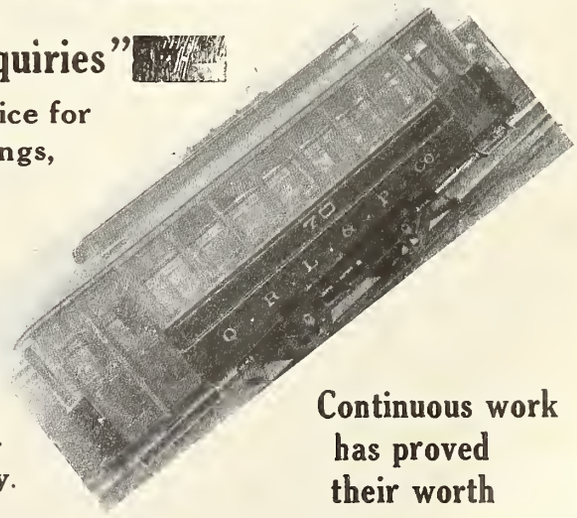

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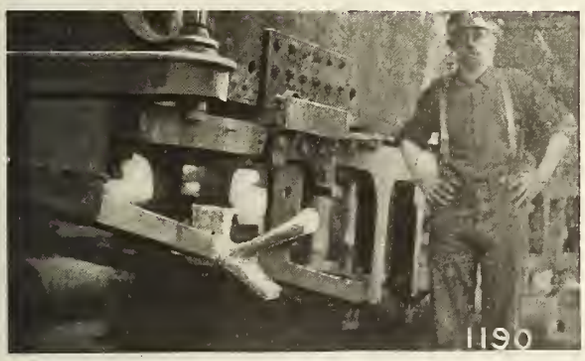
Difficult Frame Welding Made Easy with Thermit



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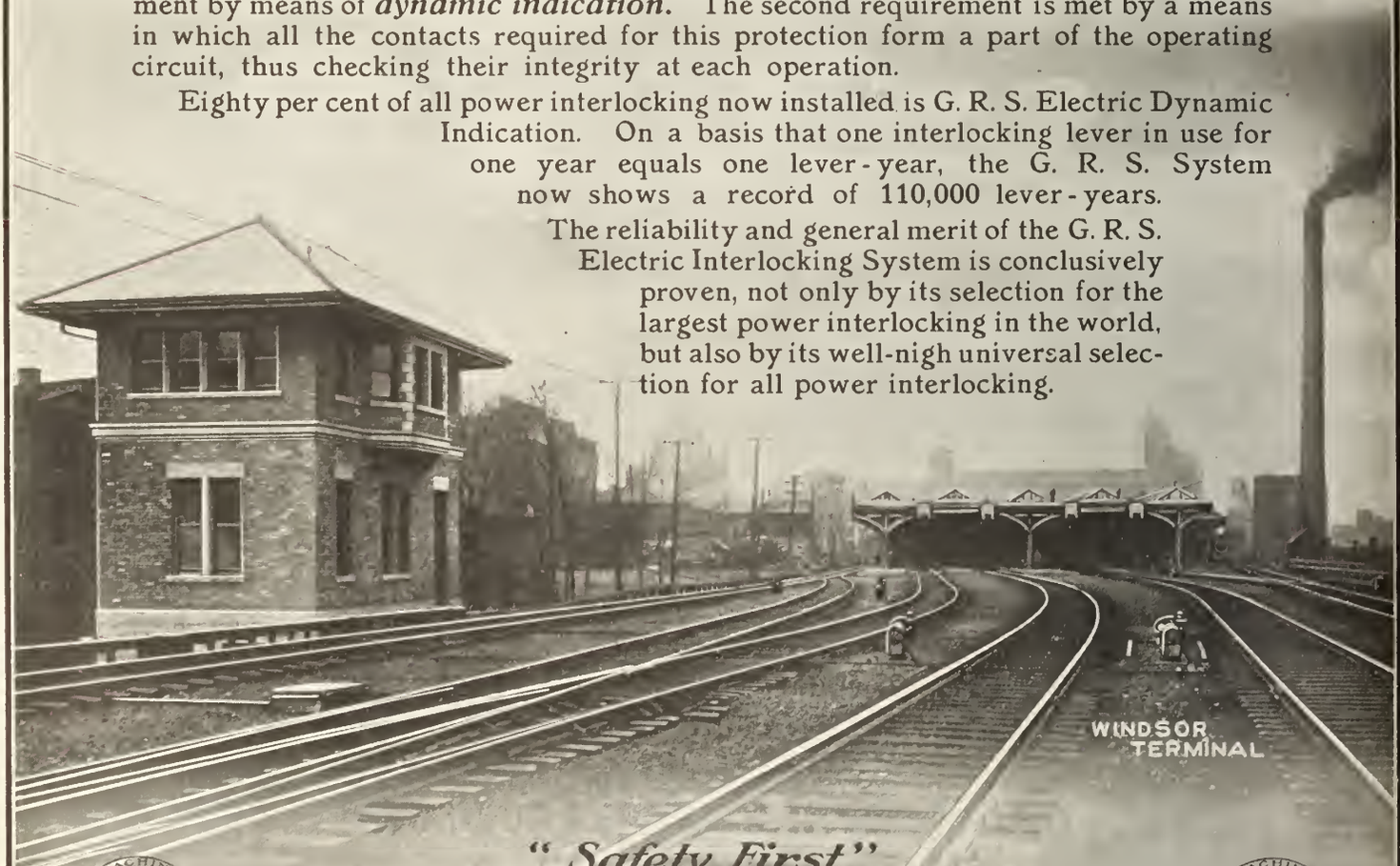

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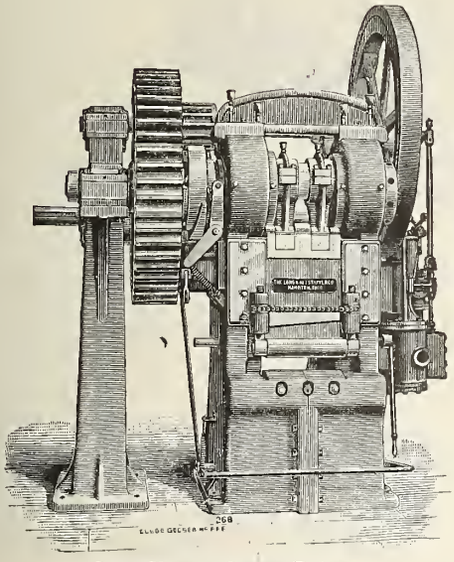

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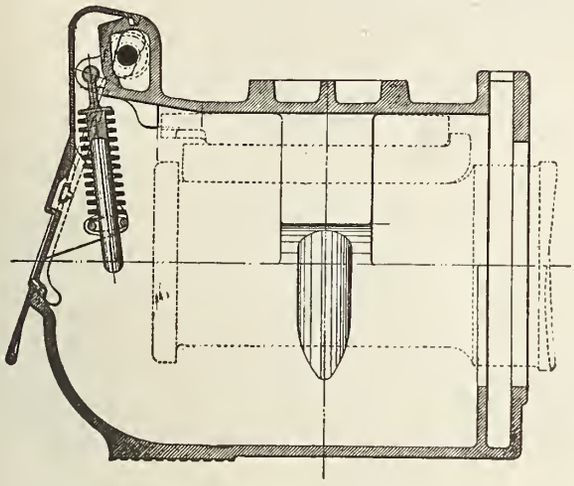

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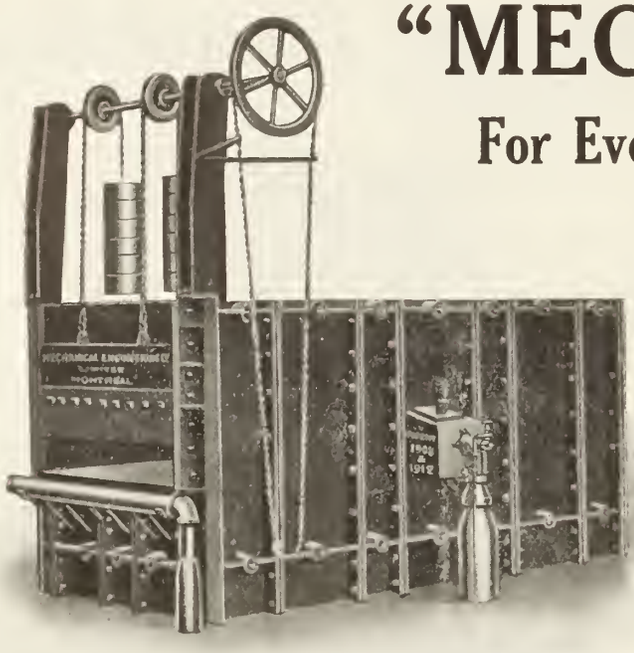

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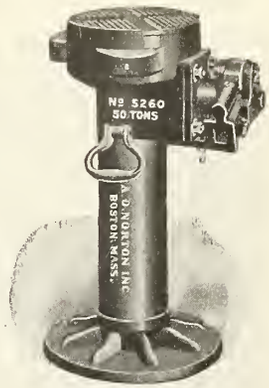

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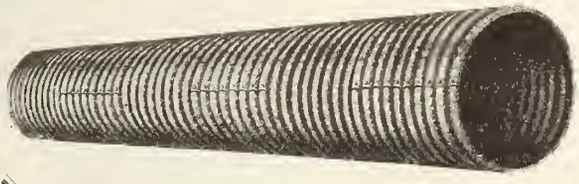

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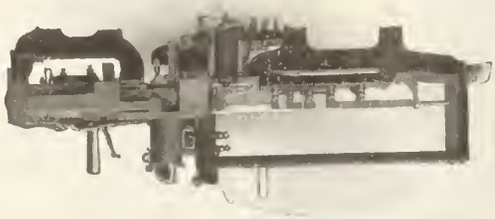

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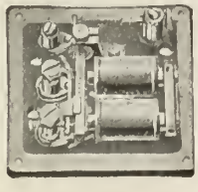

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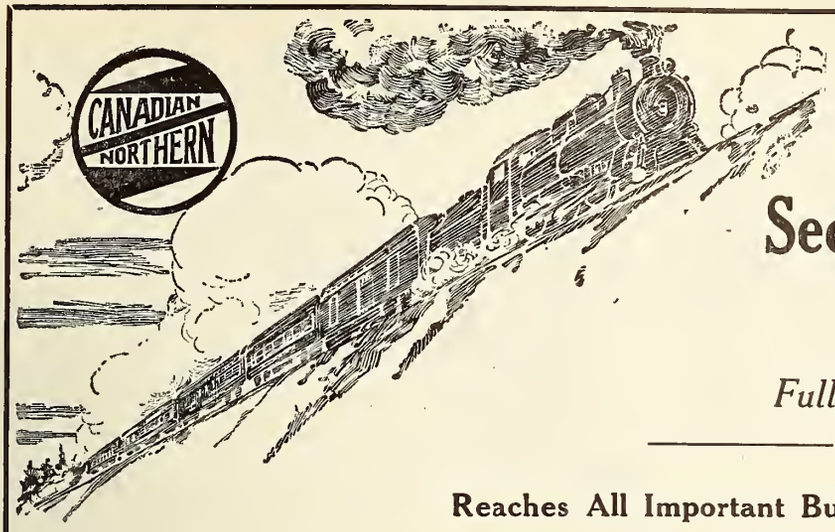

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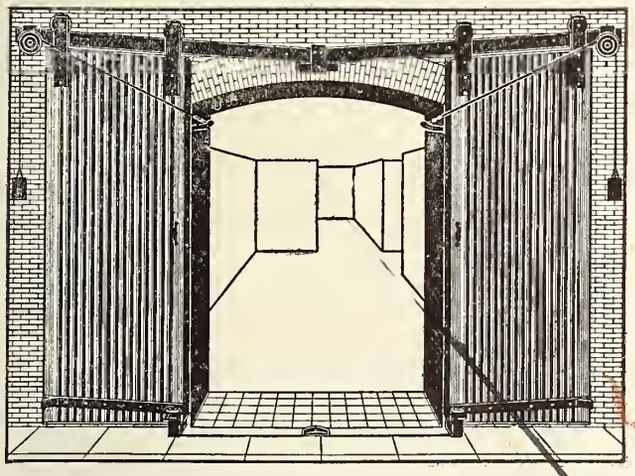

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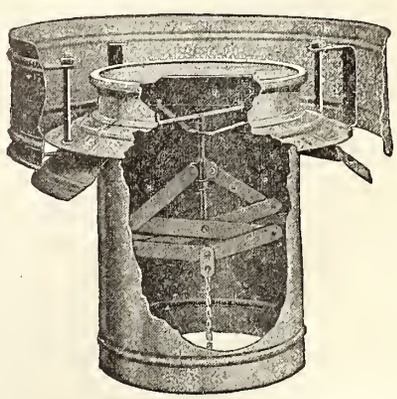

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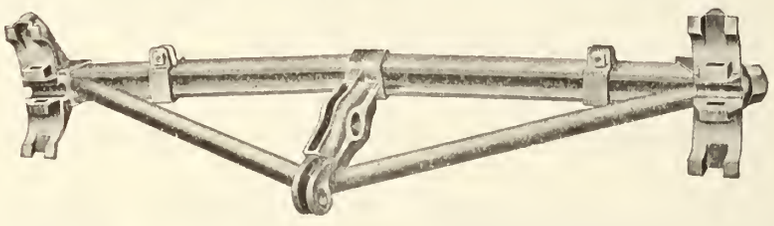

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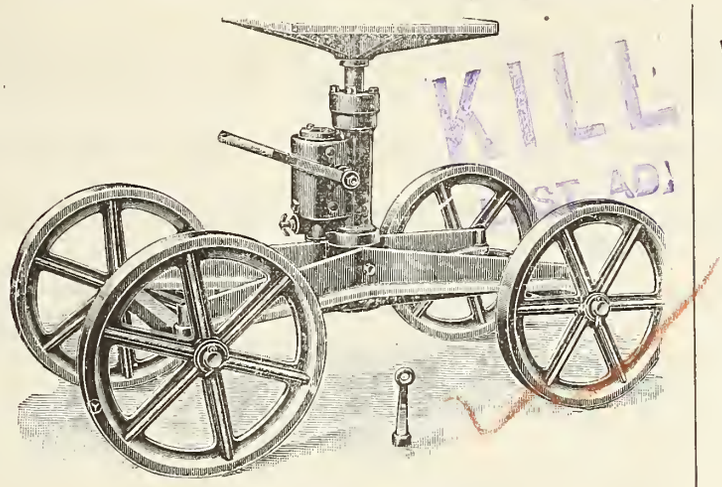

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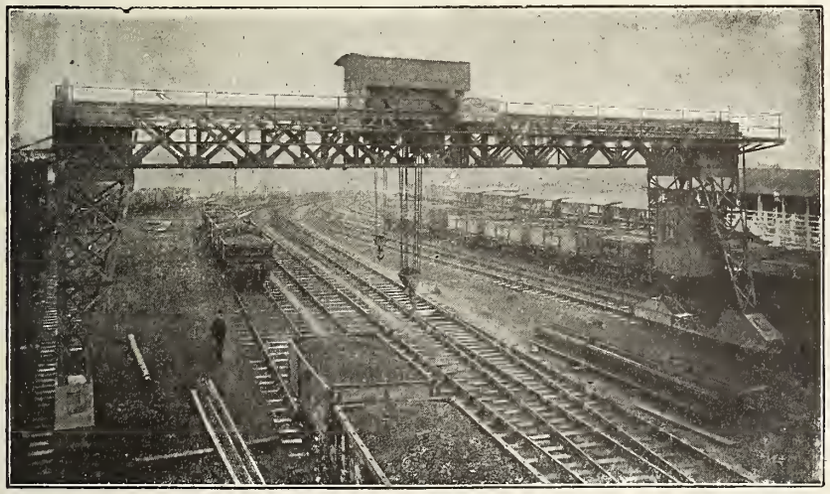

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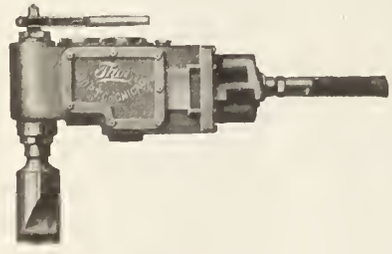

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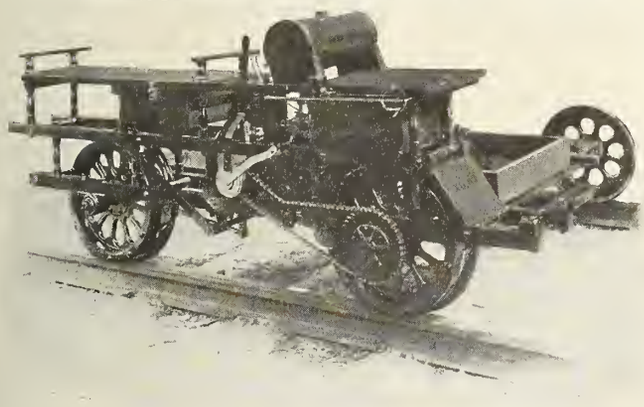

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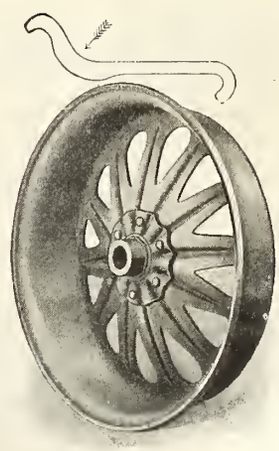

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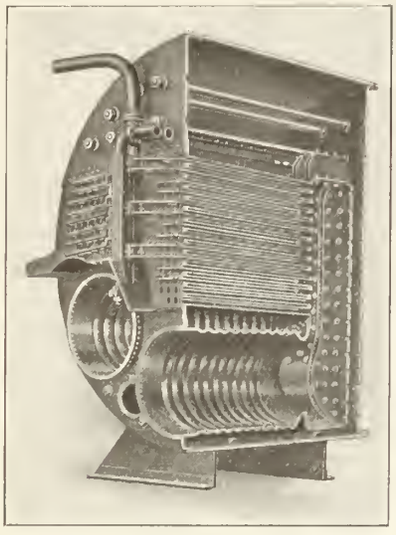

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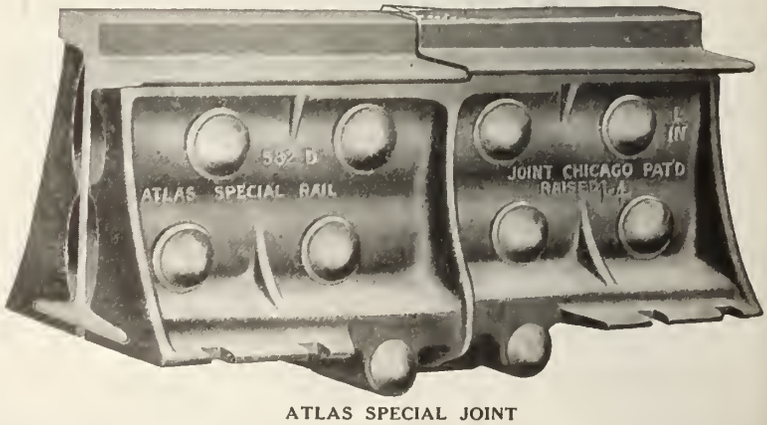

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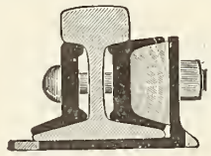
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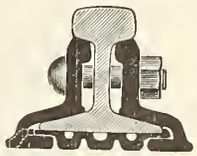
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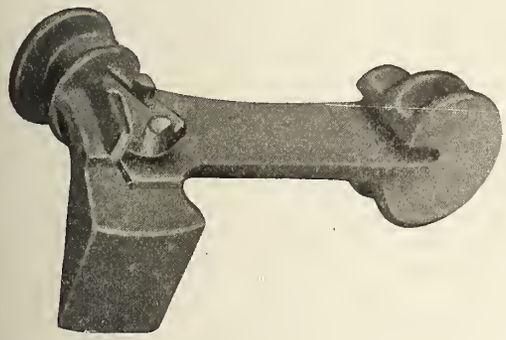

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A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars: Chicago City Railway, 839 cars; Chicago Railways, 1,328; Public Service Corporation of New Jersey, 466; New York City Railway, 555; Third Avenue Railroad, New York, 550; International Railway, Buffalo, 200; Buffalo & Lake Erie Traction Co., 10; Washington Ry. & Elec. Co., Washington, D.C., 100; Capital Traction Co., Washington, D.C., 51; Municipal Traction Co., Cleveland, Ohio, 180; United Rys. Co. of St. Louis, Missouri, 310; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25; Columbus Ry. & Lt. Co., Columbus, Ohio, 10; Wichita R.R. & Lt. Co., Wichita, Kan., 14; Jacksonville Elec. Co., Jacksonville, Fla., 5; Dallas Elec. Co., Dallas, Texas, 20; Houston Elec. Co., Houston, Tex., 41; Northern Texas Trac. Co., Ft. Worth, Texas, 25; Ithaca Street Ry., Ithaca, N.Y., 2; Peoria Street Ry., Peoria, Ill., 13; Urbana & Champaign Ry., Champaign, Ill., 3; Mutual Lt. & Water Co., Brunswick, Ga., 4; Rochester Ry. Co., Rochester, N.Y., 25; Ft. Dodge, Des Moines & So. R.R. Co., 2; Muskogee Elec. Trac., Muskogee, Okla., 6; Union Traction Co., Dubuque, Ia., 4; Topeka Ry. Co., Topeka, Kas., 12; United Rys. & Elec. Co., Baltimore, Md., 32; Detroit United Ry., Detroit, Mich., 225; Cincinnati Traction Co., Ohio, 50; Montreal Street Railway, 400; British Columbia Elec. Ry., 30; Calgary Street Railway, 18; Metropolitan Street Ry., Kansas City, Mo., 50; Edmonton Radial Ry., 4; San Antonio Traction Co., San Antonio, Tex., 6; Rockford & Int. Ry., Rockford, Ill.; Cairo Street Ry. & Lt. System, 6; Des Moines City Railway, Iowa, 12; Macon Ry. & Lt. Co., Macon, Ga.; Virginia Ry. & Power Co.; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C.; Aurora, Elgin & Chicago Ry., Chicago, Ill.; Wichita Falls Traction Co., Wichita Falls, Tex.; Ottawa Electric Ry. Co., Ottawa; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill.; Corsicana Transit Co., Corsicana, Tex.; Compania Electrica y de Ferrocarriles, Mexico; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis.; Springfield Street Ry. Co., Springfield, Mass.; Lynchburg Traction Co., Lynchburg, Va.; Chicago & Southern Traction Co., Chicago, Ill.; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

taught by this widespread use of Pay-As-You-Enter Cars is obvious. Increased Revenue, Accident Elimination and Schedule Improvement have been demonstrated in every case. Isn't all this sufficient to show that it always pays to operate the Pay-As-You-Enter Car? Why not remodel some of your present cars?

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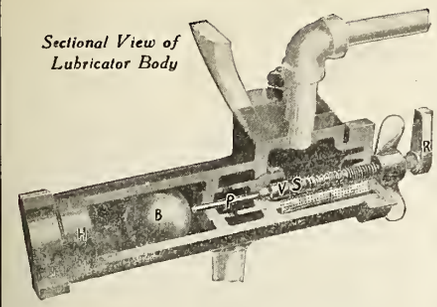

Sectional View of Lubricator Body

New Detroit Flange Lubricator

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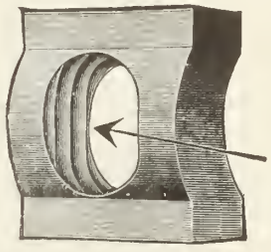

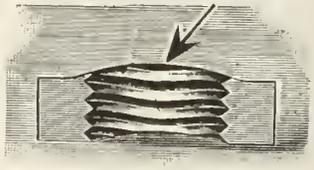

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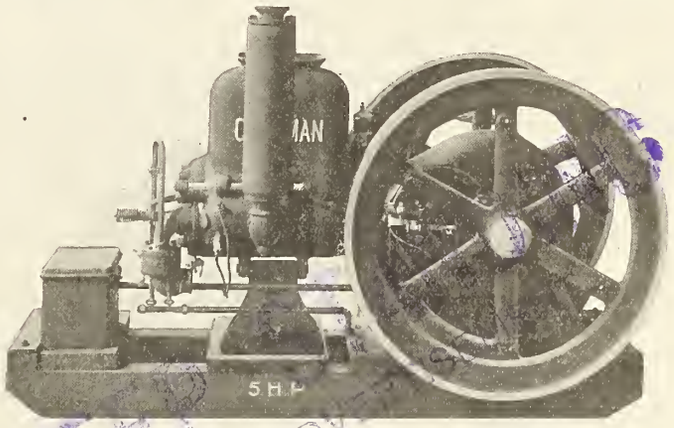

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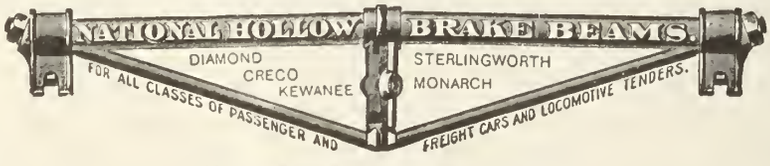

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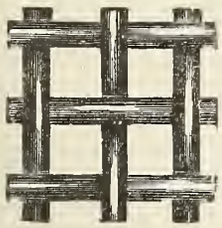

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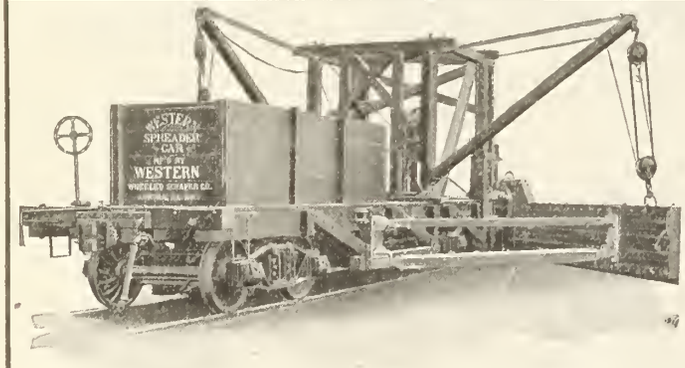

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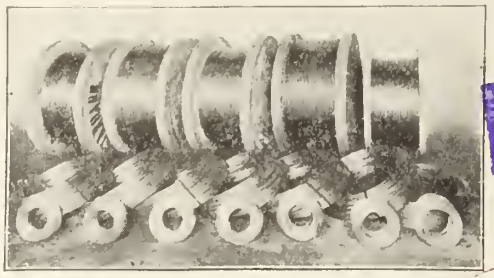

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Norfolk House, Laurence Pountney Hill, London, E.C.
808 McArthur Bldg., Winnipeg, Man.

FIRTH'S TOOL STEELS

Can be depended upon. They represent **Crucible Steel** in its highest stage of development, and are recognized as **Standard Brands** in every country where steel is used.

We carry the largest stock of High Grade Tool Steel in Canada.

All principal sizes Annealed and Unannealed.

THOS. FIRTH & SONS, LIMITED

Norfolk Works and Tinsley Works, SHEFFIELD, England.
Works also at Riga, Russia; McKeesport, Pa., and Washington, D.C.

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507 St. Paul St.

J. A. SHERWOOD
Canadian Manager

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MORTON MANUFACTURING CO.

Draw Cut Pillar Shapers. Special Draw Cut Locomotive Axle Box Shapers. Locomotive Cylinder Planers. Portable Slotters, Steel Foundry Shapers, Frog and Crossing Shapers, Stationary and Portable Keyway, Cutters, Finished Machine Keys. Office and Works, MUSKEGON HEIGHTS, MICH., U. S. A.

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Nova Scotia Steel and Coal Co.
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International Nickel Co.
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Carborundum Co.
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TAPS
Butterfield & Co.
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Trolley Supply Co.
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TRUCKS, MOTOR CAR
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Dominion Bridge Co.
TURBINES, STEAM
Canadian Allis-Chalmers
TURNBUCKLES
Canadian Steel Foundries
TURNTABLES
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VALVES
Canadian Detroit Lubricator Co.
Canadian Fairbanks-Morse Co.
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VALVES, ANGLE AND GLOBE
Canadian Detroit Lubricator Co.
Ohio Brass Co.
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Canadian Detroit Lubricator Co.
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VALVES, IRON GATE
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Canadian Allis-Chalmers
WELDING
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Carborundum Co.
WHEELS, CAR
Canadian Car & Foundry Co.
Nova Scotia Car Works
Jas. W. Pyke & Co.
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Steel Co. of Canada
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Youngs
WINDMILLS
Ontario Wind Engine & Pump Co.
WIRE
Titanium Alloy Mfg. Co.
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Canada Wire & Cable Co.
Dominion Wire Rope Co.
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Mussens, Limited
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WIRE, BARE COPPER
Canada Wire & Cable Co.
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Northern Electric Co.
E. F. Phillips Electrical Works
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WIRE GOODS, BRIGHT
Steel Co. of Canada
WIRE, INSULATED, COPPER
Canada Wire & Cable Co.
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Northern Electric Co.
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WIRE, TRANSMISSION AND TROLLEY
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Northern Electric Co.
Standard Und. Cable Co. of Can.
WRENCHES, CAST STEEL
Amer. Brake Shoe & Fdry. Co.
YACHTS
Polson Iron Works.

Money paid for these Brake Shoes was largely money wasted

Why?

Because these unreinforced brake shoes did not give equivalent service for their cost, having broken in service before their life had barely commenced.

And the remedy?

Use only Steel Back Brake Shoes—then you will get your brake shoe money's worth in long and safe service.

Manufactured in Canada.

AMERICAN BRAKE SHOE & FOUNDRY CO.

The HOLDEN CO., Ltd., Agents, 354 St. James St., Montreal.

STANDING ADVERTISEMENT.

TRADE MARK ASBESTOSLATE ASBESTOS SHINGLES

ASBESTOS MANUFACTURING COMPANY, Limited

E. T. BANK BLDG., 263 ST. JAMES ST., MONTREAL

FACTORY AT LACHINE, P. Q. (Near Montreal)

THE ASBESTOS MANUFACTURING CO LIMITED MAKERS OF THE BEST IN ASBESTOS

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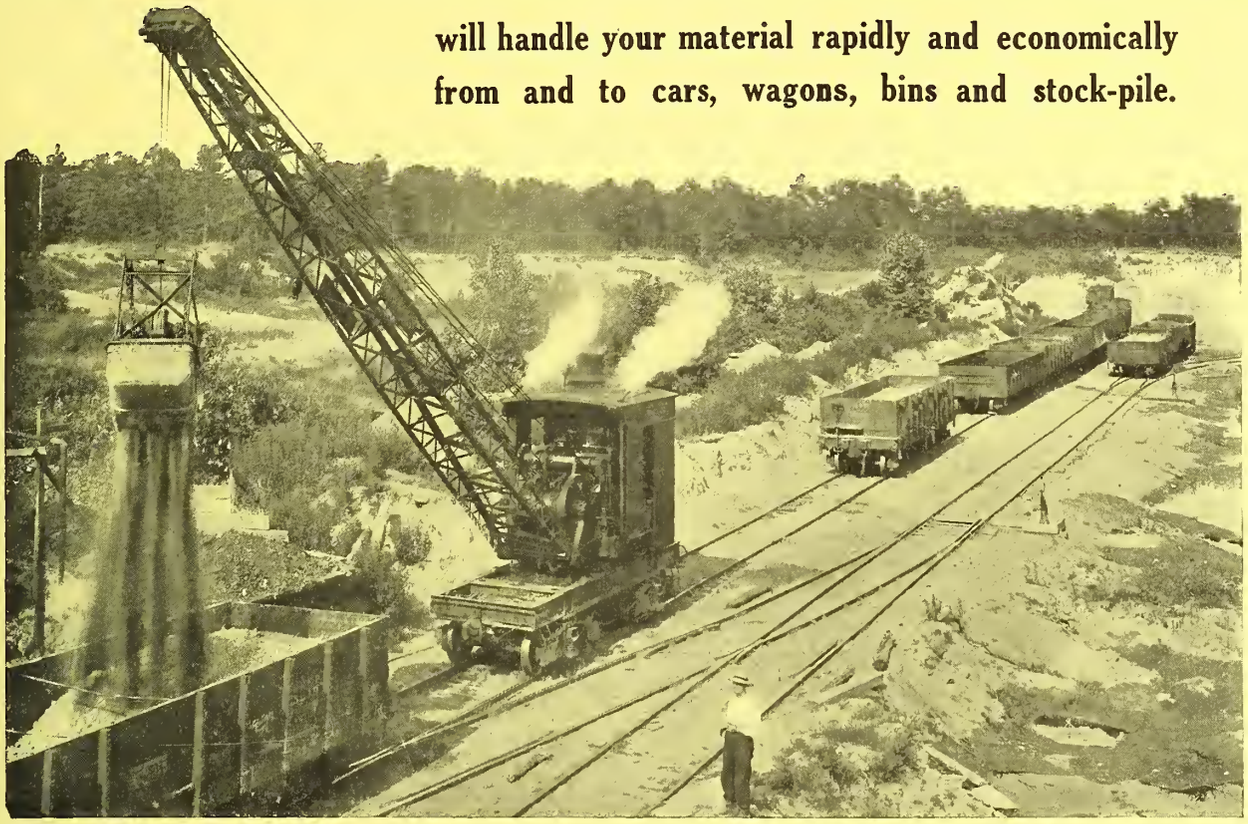
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

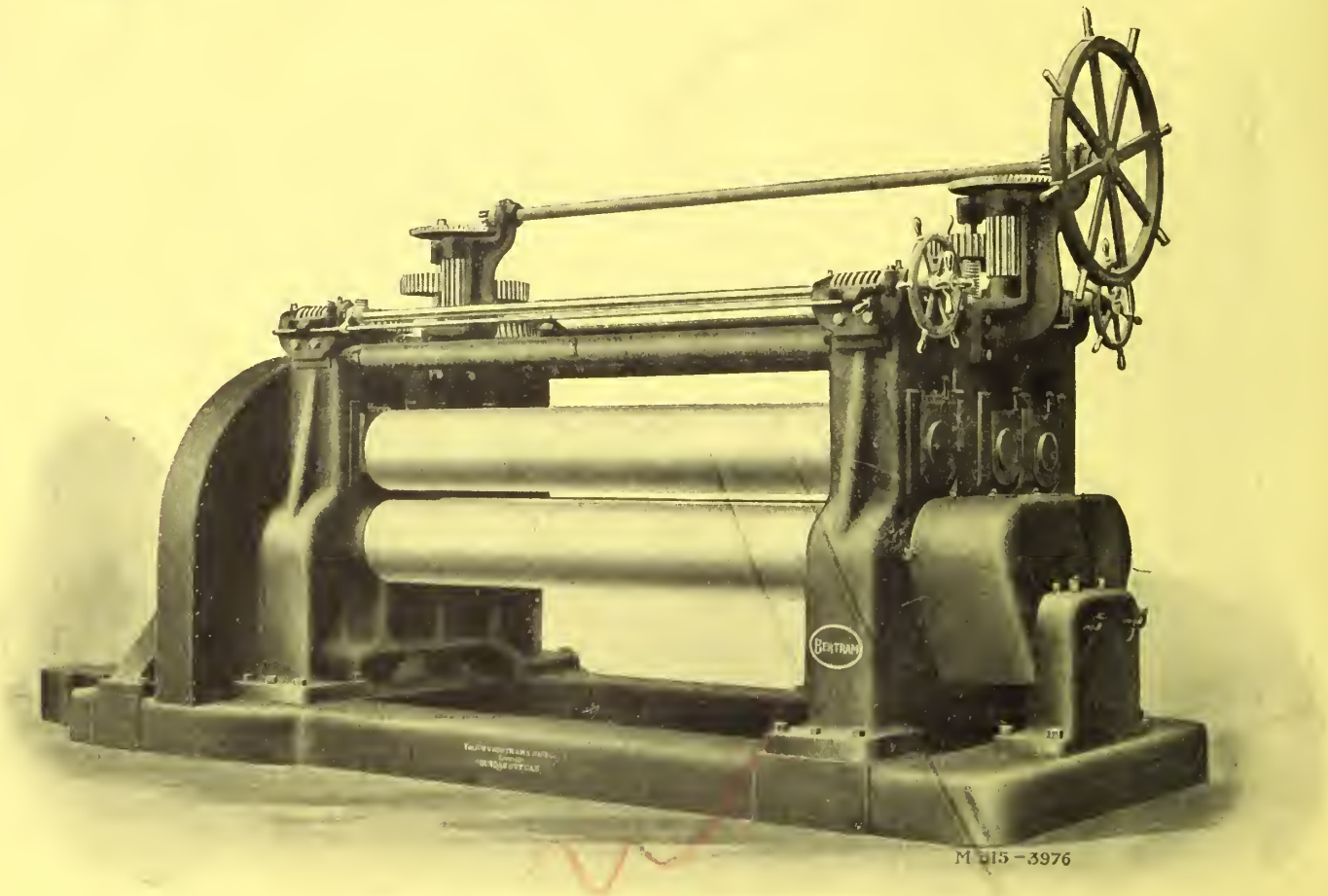
And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO, U.S.A.

Bending and Straightening Machines



SIX-ROLL PLATE STRAIGHTENING MACHINE

With Reversing Motor Drive.

Capacity for ⅞-inch plates 8 feet wide.

We build a complete line of Bending and Straightening Rolls for all classes of work. Specifications and photographs sent on request.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

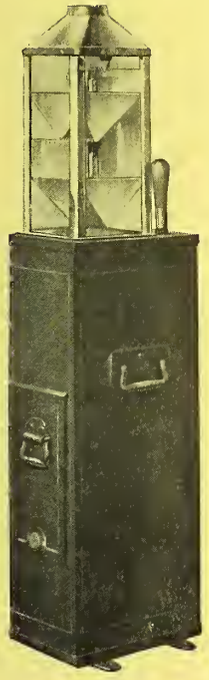
Agents: The Canadian Fairbanks-Morse Company, Limited

Offices: MONTREAL, TORONTO, WINNIPEG, VANCOUVER, CALGARY, SASKATOON, ST. JOHN.

Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 198 — TORONTO, CANADA, AUGUST, 1914 — Subscription Rates Page 373

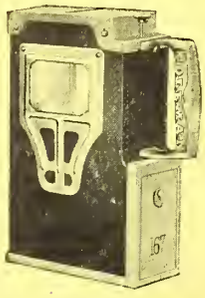


For Reliability and Security
Use

Coleman Fare Boxes

These boxes are the result of years of experience in the manufacture of fare boxes. They are used by 90 p.c. of the electric railways in Canada, and their reliability and security are proven.

When you buy a COLEMAN BOX you are buying a box that has stood the test of time, and satisfaction is guaranteed.



This company has the exclusive right to manufacture and sell the Sowerby patent attachment for portable boxes, and the Gale seal lock for either portable or stationary boxes.

Coleman Fare Box Co., Ltd.

Manufacturers of Portable and Stationary Fare Boxes

Works
Tottenham, Ont.

Head Office
70 Bond Street, Toronto

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Westinghouse

Brakes and Motors For City Service

No. 101-B Railway Motor

Here are some of the features originally introduced with the No. 101-B Railway Motor:

Bearings with individual oil chambers allowing the oil to be gauged, thus preventing waste.

Brushholders with mica insulated studs, adjustable tension, braid shunts, increasing life of carbons and commutator.

Improved Commutator eliminating loose bars. Mica projected beyond bars on back end, preventing short circuits between segments.

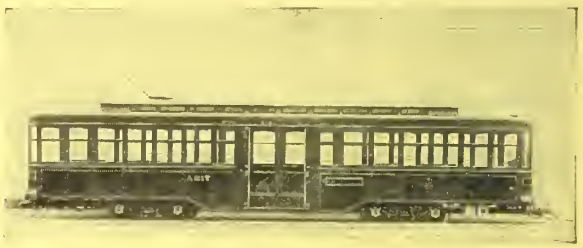
Strap Wound Field Coils with ribbon asbestos insulation. Heavy cushion springs to prevent vibration.

Armatures with improved forming and insulating of coils. Straight out arrangement of windings for front end banding.

Spider Construction, making it possible to remove shaft any number of times without disturbing the windings.

The fundamental features of this motor have made all Westinghouse Railway Motors successful.

SME Brakes



City service requires a brake quick in action, and capable of withstanding continuous hard service, such as the

Westinghouse
SME Straight Air Brake
with Emergency Feature

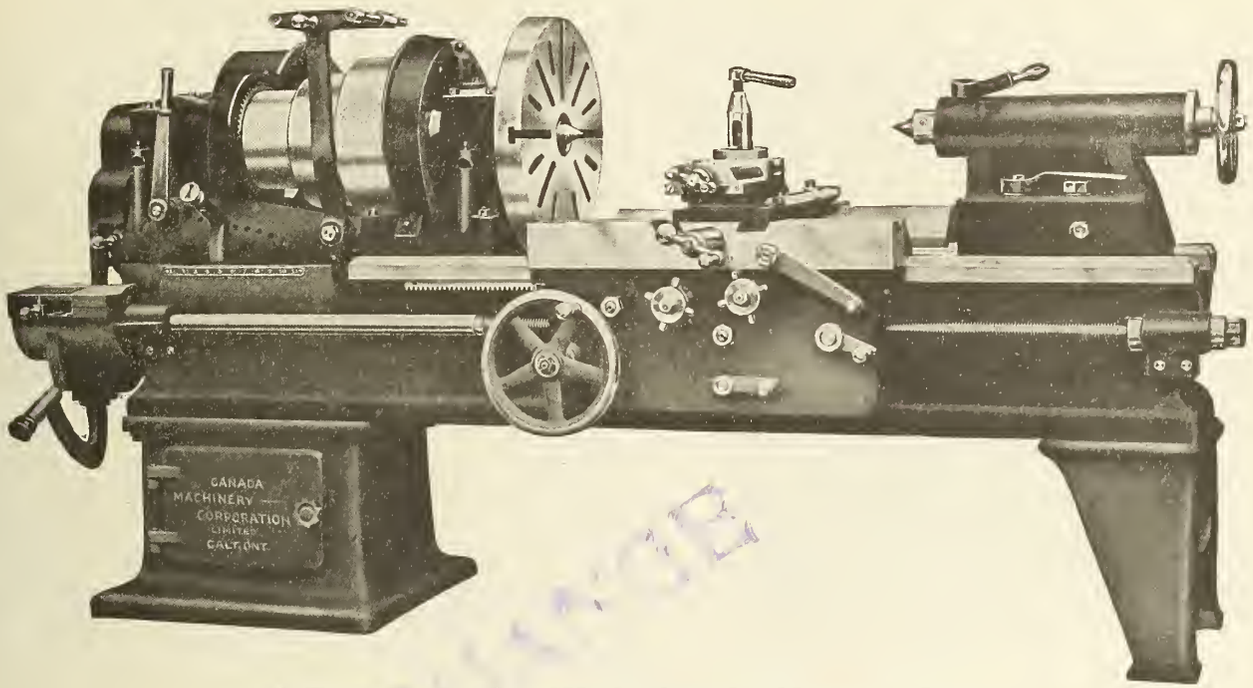
This equipment contemplates handling a motor car continually with "straight-air." When a trailer is added it is also handled by "straight-air" during application and release of the brakes in ordinary service, but it also embodies the factor of safety in emergencies, whereby the brakes are applied at emergency pressure automatically, or at the will of the motorman at the brake valve.

Our engineers stand ready at any time to consult with traction officials and advise as to the best equipment to meet their conditions. A request to our nearest office will receive immediate attention.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX	WINNIPEG	CALGARY	VANCOUVER
Traders Bank Bldg.	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.	58 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

LATHES C.M.C. LATHES



20" Engine Lathe With Quick Change Gears.

A SAFETY BELT SHIFTER IS PART OF THE STANDARD EQUIPMENT OF ALL OUR LATHES.

The practice of shifting lathe belts from step to step of the cone by hand is dangerous, and in the present time of "SAFETY FIRST" movement this practice should receive attention.

A point to be considered.

By the use of our improved belt shifting device the operator can easily and quickly shift the belt without endangering himself.

The head stock of all our lathes is of unusually massive construction, and is equipped with extra wide faced cones to enable modern high speed steel to be used advantageously.

We have a lathe catalogue giving all the details of the improved design and construction of our lathes which we would be pleased to send on request.

We are Canada's largest lathe builders.

Representatives:—

QUEBEC:
Williams & Wilson, Limited,
Montreal

MANITOBA:
The A. R. Williams Machinery Co., Ltd.,
Winnipeg

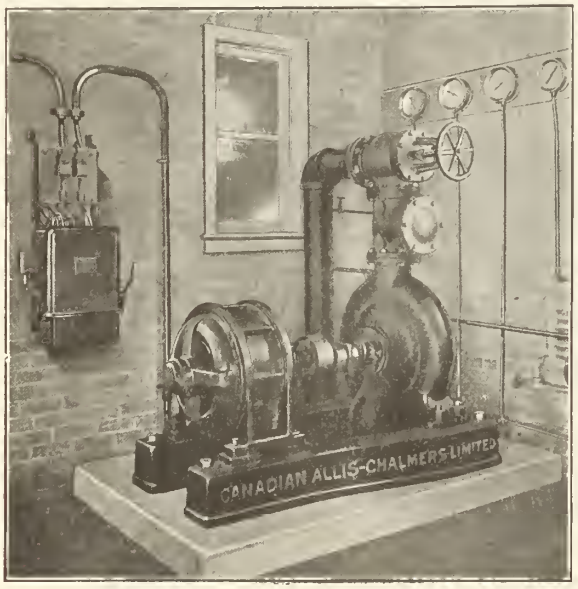
Canada Machinery Corporation, Ltd.

GALT, ONTARIO

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.

PUMPING MACHINERY

DESIGNED AND BUILT TO SUIT CONDITIONS OF OPERATION

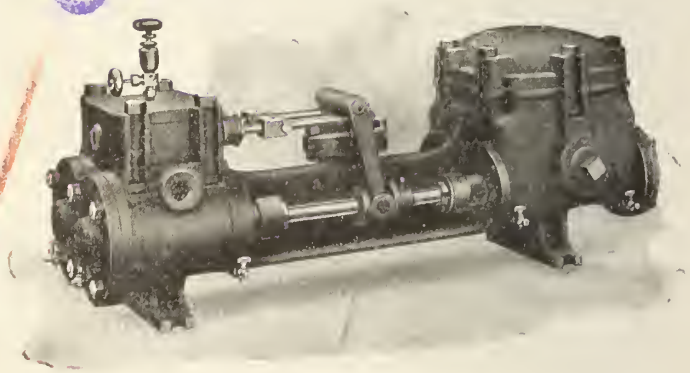


CENTRIFUGAL PUMPS
DUPLEX PUMPS
GEARED PUMPS
"HIGH DUTY" PUMPING ENGINES
SCREW PUMPS
TURBINE PUMPS
UNDERWRITERS' FIRE PUMPS
HYDRAULIC TRANSMISSION PUMPS

Mather and Platt Turbine Pumps built by us are in use for a great variety of purposes, including waterworks, boiler feed, condensing, and circulating service, locomotive supply, bilge and dock pumping, fire and sewage. The pump in the illustration has a capacity of 300 gals. per min. at 1450 r.p.m., against 105 ft. head.

Our new Duplex Steam Boiler Feed Pumps have been designed with the idea of making them more compact and accessible than any pumps hitherto offered for this service.

These new standard pumps can be furnished in sizes to give any quantity of water desired up to 2,000 U.S. gallons per minute against a working pressure of 150 lbs. per square inch, with a steam pressure of approximately 100 lbs. square inch.



CHANGE

CANADIAN ALLIS-CHALMERS,

LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Specialties, Steam Shovels, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Wheels, Water Pipe.

Head Office: Toronto. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

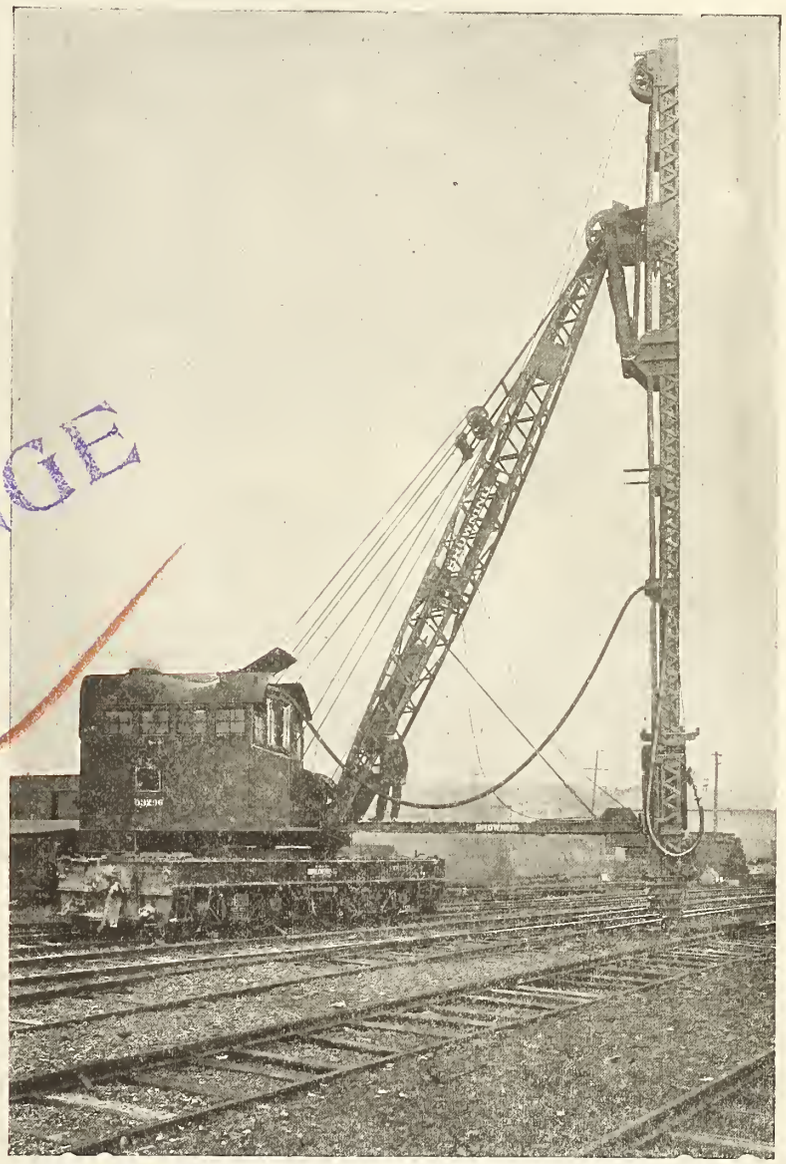
McKIERNAN-TERRY PILE HAMMERS

The use of McKiernan-Terry Pile Hammers is not confined to any particular class of work, but extends into all branches of the industry where in various forms piling is now so extensively used. They are especially adapted for driving sheet piling for cofferdams and caissons, permanent retaining walls, cutoffs to prevent the percolation and seepage of water beneath dams and sea walls, in the building of bulkheads and jetties and for many other similar uses where sheet piling is employed to stop the flow of water or movement of soil. Deeper excavations and more substantial foundations needed to support large buildings and other massive structures, required the use of heavier wood and concrete piling than had been employed heretofore, and for work of this character our heavy duty pile hammers were designed.

They will drive equally well large pipe, which is now so extensively employed in foundation and under-pinning operations.

McKiernan-Terry Pile Hammers are well adapted for and will readily drive the largest and heaviest kinds of piling that is at present being used. Recent tests made with one of our No. 9 pile hammers in driving heavy wooden sheeting through foreign material—gravel, fill, etc.—showed that it would do more effective work than a 6,000-pound drop hammer. The tests further demonstrated that rapid and uniform piston blows were more efficient than the heavy and infrequent blows of the drop hammer, and that it was possible to attain the same penetration in the miscellaneous material without splitting or "brooming" the piling.

The heavy duty pile hammers can be used in fixed leads of a land or floating pile driver, or swung without leads from the boom of a crane or derrick, and may thus be moved about from pile to pile within reach of the boom without shifting the derrick. Where a long line of sheeting is to be driven for dams, retaining-walls, sewers, etc., the hammers may be operated on cableways being raised and lowered by a winch or block and fall. The design of these hammers permits of the ready attachment of angle guides to fit fixed leads.



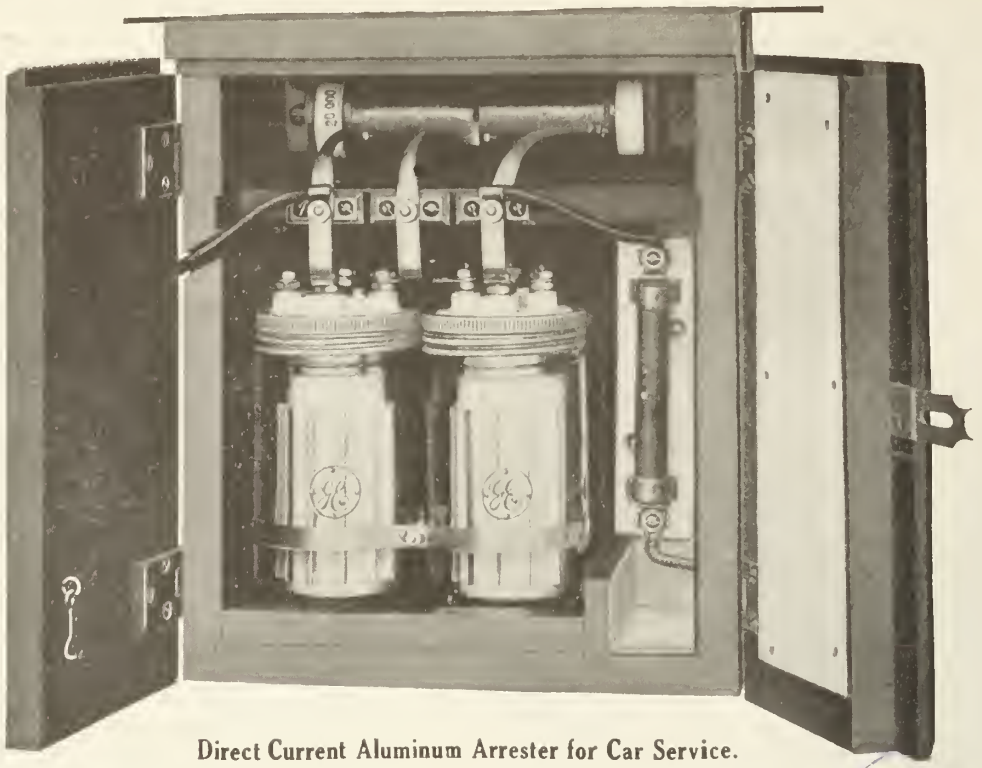
No. 9 Pile Hammer working in folding pile driver attachment of a locomotive crane used in railway work.

Sole Agents in Canada

CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



Direct Current Aluminum Arrester for Car Service.

Maximum Lightning Protection for Railway Circuits

The C. G. E. Direct Current Aluminum Lightning Arrester gives the maximum protection obtainable for railway car equipment and also for station apparatus.

These arresters have been specially designed for railway service, and operate on the same principle as the well-known Aluminum Arrester for Alternating Current Circuits.

The following reports from four users indicate the performance of these arresters in recognized storm localities:

"With these arresters we have enjoyed practical immunity from lightning troubles."

"There have been no cars in with lightning damages. Two of the locomotives show that high tension, 23,000 volts, had blown the fuse. The motor was not injured in either engine."

"During the eight months that these cells have been in service we have had several electric storms and have lost only one 30 amp. fuse."

"We have all of our newer equipment protected by this arrester, and to date have no record of any being damaged by lightning."

C. G. E. Direct Current Aluminum Arresters are recommended for use in localities where lightning storms are exceptionally severe.

Where lightning is not severe enough to justify the higher cost and maintenance of the aluminum arrester, C. G. E. Magnetic Blowout Arresters give a satisfactory degree of protection at a reasonable cost and with a minimum of attention.

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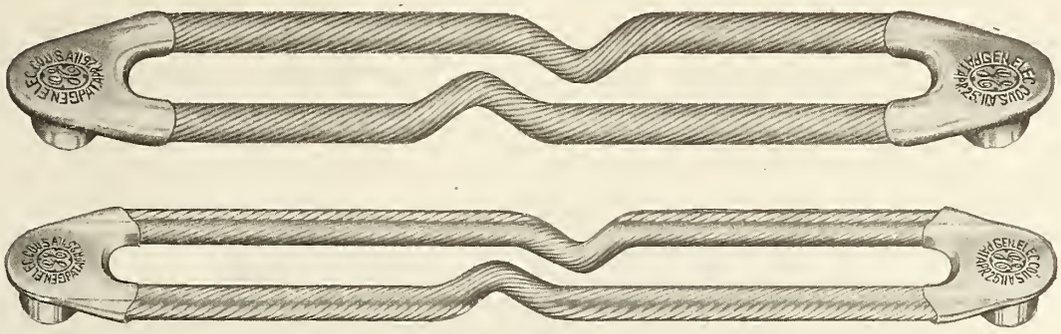

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and prove C-G-E quality for yourself

The outside appearance of a railbond is an insufficient indication of its quality. You must get inside.

C-G-E Railbonds Are Properly Welded

Saw the stud on a railbond terminal through to the weld and break off one part. If properly welded, a bright, clean break will be shown.

C-G-E Railbond Studs Will Flow Under Compression

Compress the terminal of one of your railbonds into a grooved hole in a steel block of the same thickness as a rail section. If the stud is soft and malleable, a cross section will show the grooves completely filled with copper.

C-G-E Railbond Studs Are Ductile

Smash down a terminal stud to a thickness of a quarter inch. If the copper is really ductile, it will show no cracks.

Do not take the quality of your railbonds for granted. Try them out for yourself and know.

Will the Railbonds You are Using Stand These Tests? C-G-E Bonds Will.

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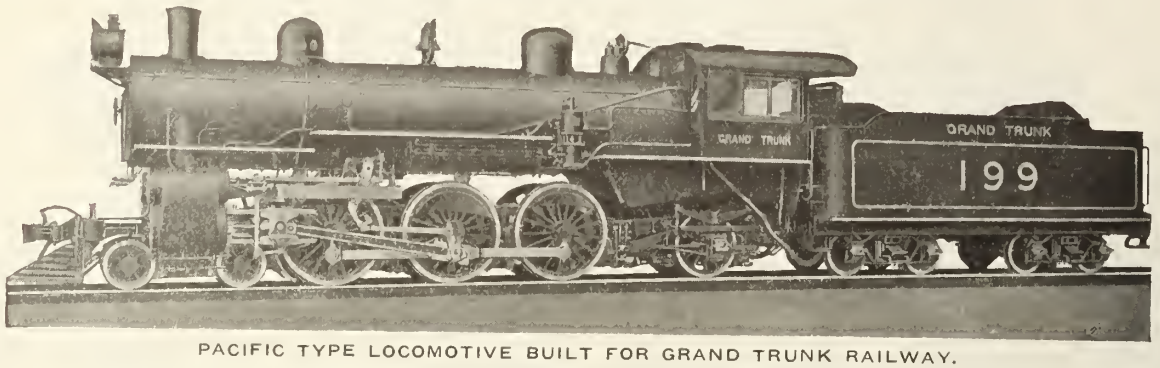
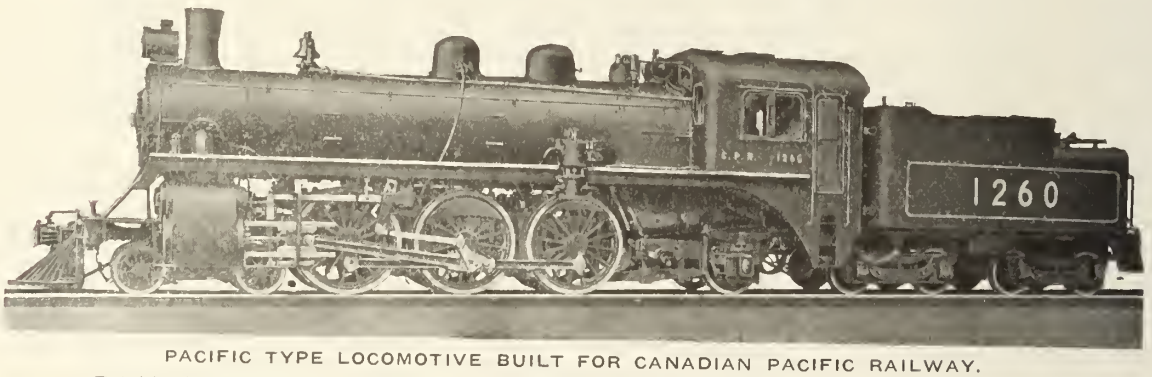


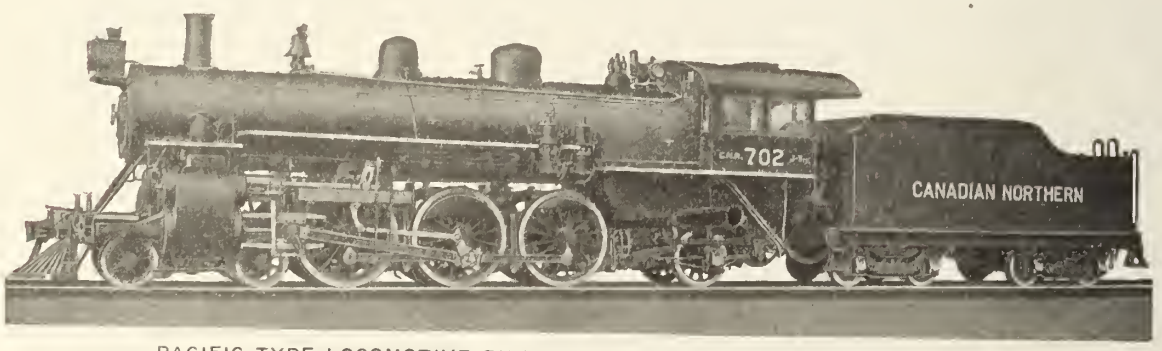
PACIFIC TYPE LOCOMOTIVE BUILT FOR GRAND TRUNK RAILWAY.

Total Weight of Engine, 226,000 pounds; Weight on Drivers, 145,500 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 185 pounds; Cylinders, 23 x 28 Inches; Maximum Tractive Power, 33,900 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN PACIFIC RAILWAY.

Total Weight of Engine, 223,000 pounds; Weight on Drivers, 142,000 pounds; Diameter of Drivers, 70 Inches; Boiler Pressure, 200 pounds; Cylinders, 22½ x 28 Inches; Maximum Tractive Power, 34,500 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN NORTHERN RAILWAY.

Total Weight of Engine, 216,000 pounds; Weight on Drivers, 136,400 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 170 pounds; Cylinders, 23 x 28 Inches; Maximum Tractive Power, 31,100 pounds.

These locomotives represent the combined knowledge and experience of the officials of the roads and builders.

They were designed and built to fit the physical and operating conditions of the roads.

They include only features which have been thoroughly proven in service, skillfully combined in proportions known to be correct.

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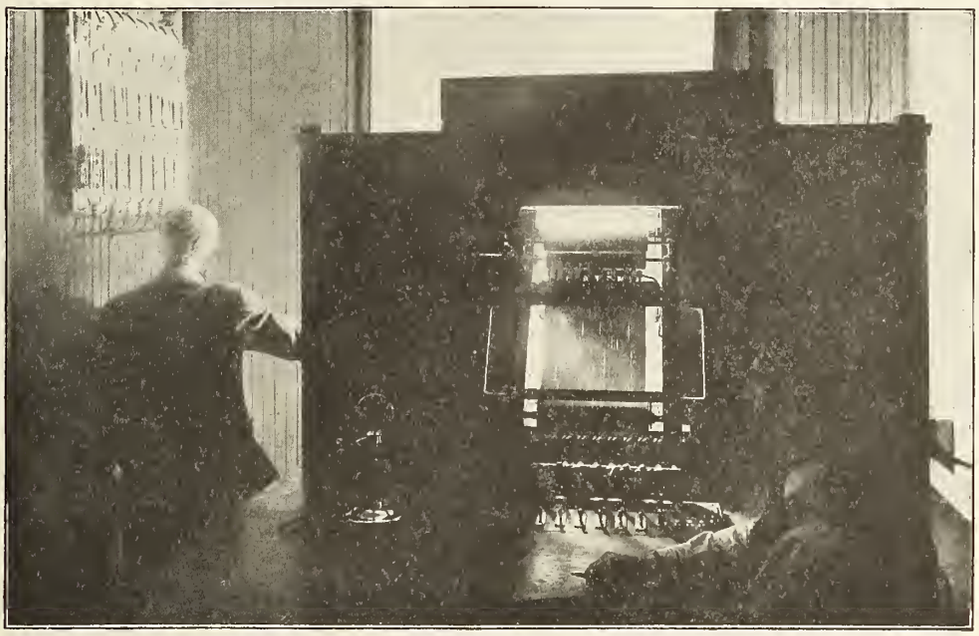

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for contractors, industrial works, railroads, etc.

CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 16 tons. Weight of tender in working order 150,000 lbs.

We have had fifty years' experience as builders of locomotives. Our expert workmen are in many cases the sons or grandsons of men who worked in our shops many years ago. Combined with this long experience and expert workmanship, we have new equipment, efficient management and expert designers.

Special attention is paid to economy of maintenance; also to design of boiler and fire-box to ensure ample steam capacity and economy of fuel.

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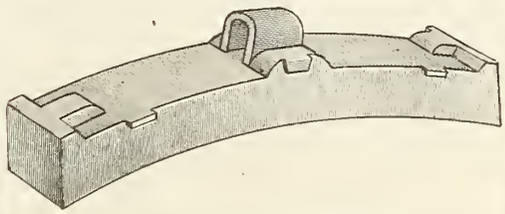

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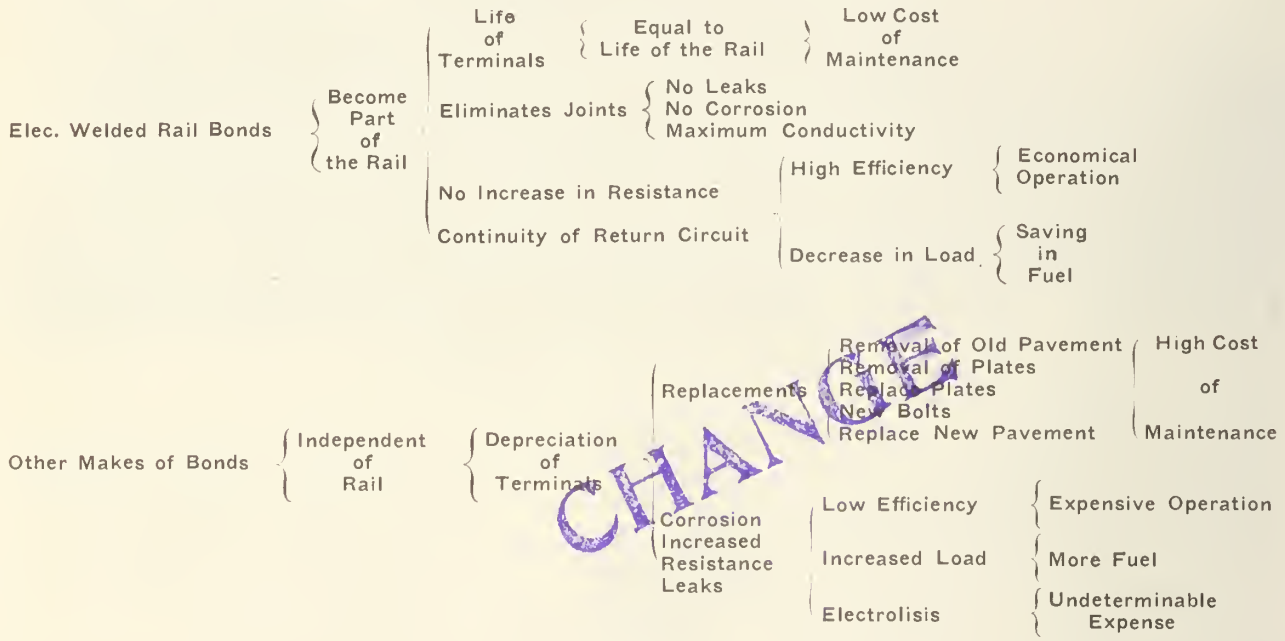

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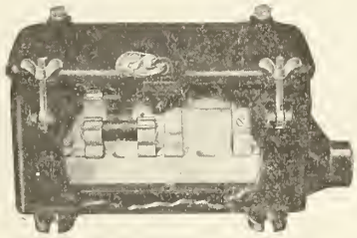
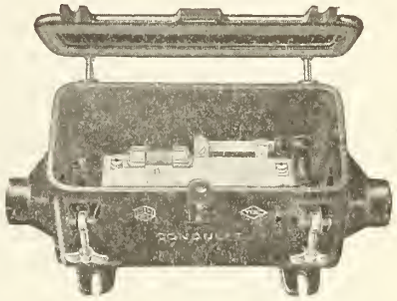


Type YKW Condulet with Door Locked.

Cut-away View, Showing Two-pole Type YKK Switch Mounted.



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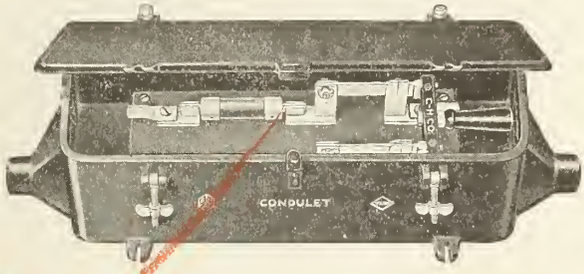

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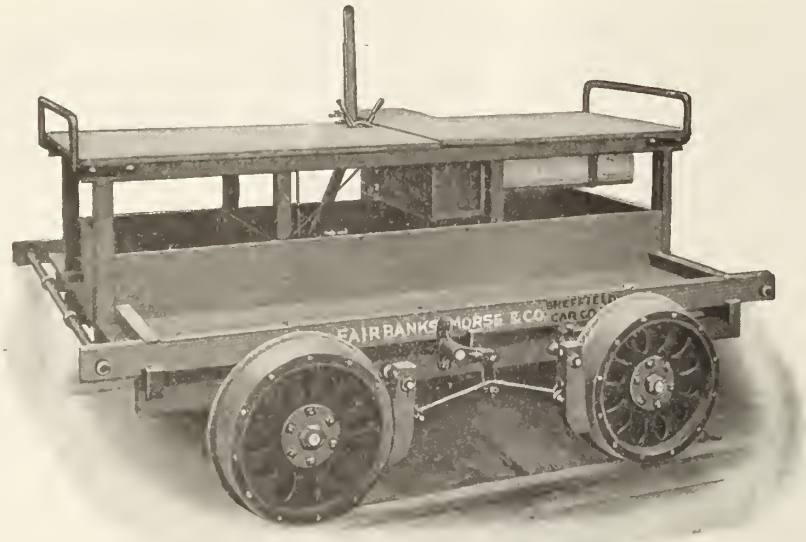

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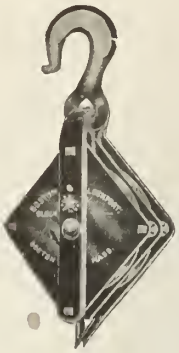

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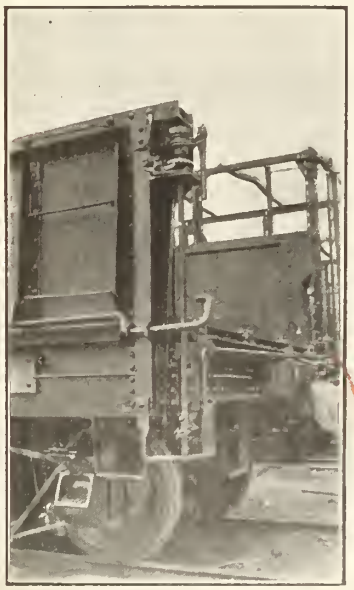

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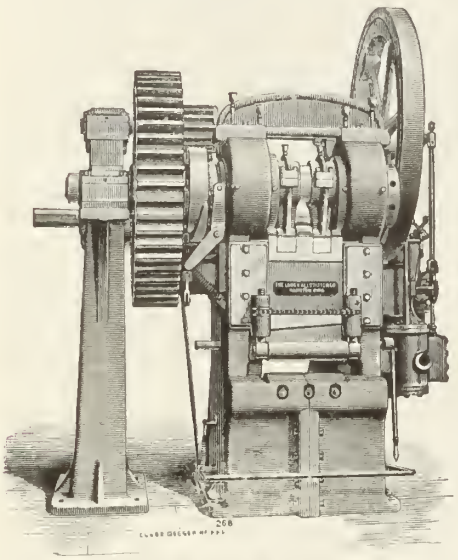

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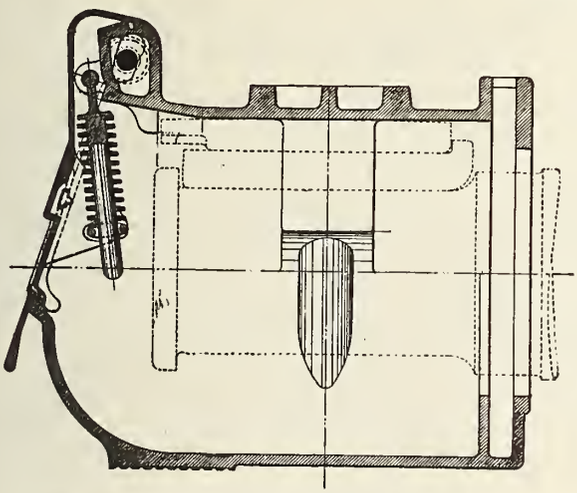

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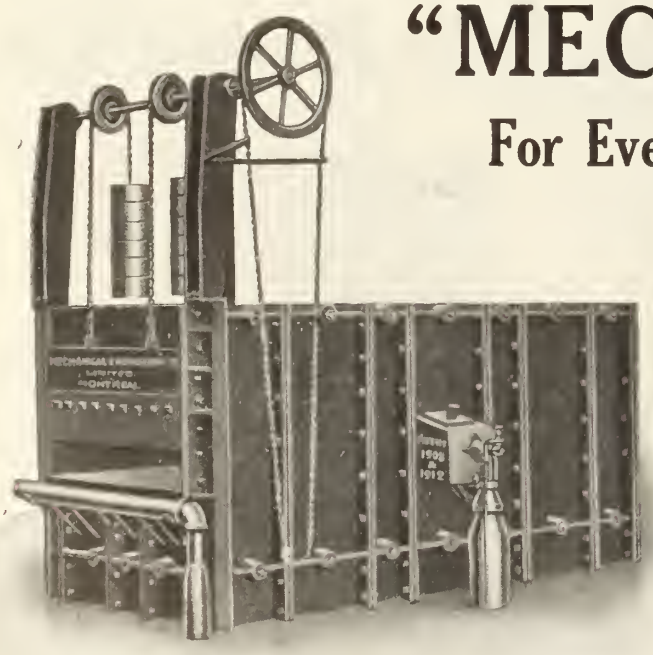

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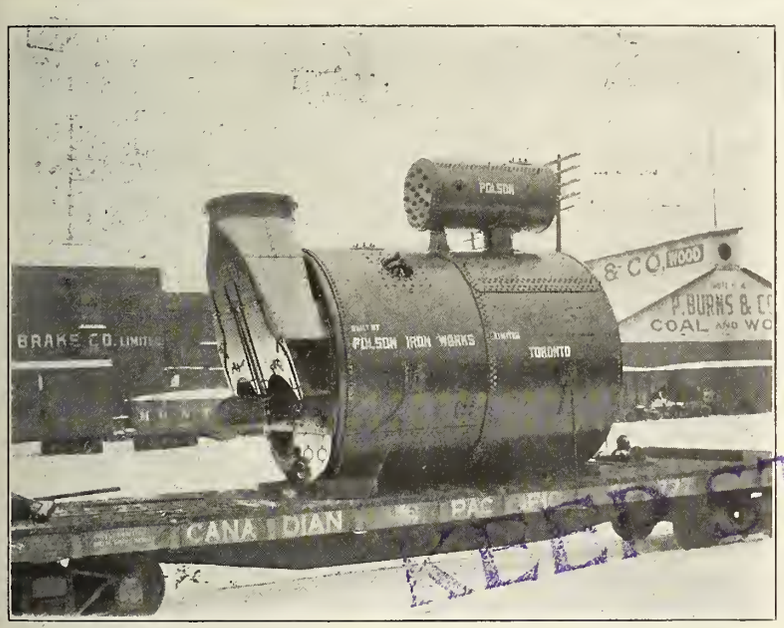

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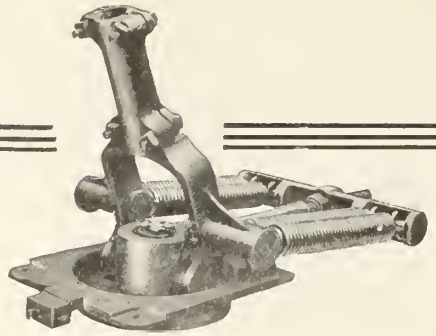

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Canadian Railway and Marine World

August, 1914.

Rolling Lift Bridge at Fort William for Canadian Pacific Railway.

By J. G. Seyfried, Engineer, Bridge Department, Canadian Allis-Chalmers, Ltd.

There has recently been completed for the C.P.R. a lift bridge across the McKellar River, at Fort William, Ont., to enable it to reach its new terminal yards on Island No. 1. It is a single leaf, four track, Scherzer rolling lift bridge. The movable span is 120 ft. c. to c. of supports, giving a clear channel of 114 ft., while the track for the segmental girder is 32 ft. long. The total width of the bridge out to out is 61 ft. Two of the tracks are for the C.P.R.; the other two are for electric cars. There are three trusses 31½ ft. c. to c. and 31½ ft. deep. The segmental girders have a radius of 25 ft., and when the bridge is rolling or opening they travel approximately 30 ft.

There are two operating motors, which are not fixed on the stationary part of the bridge, but move with the bridge when it opens. They are connected by gearing to pinions which mesh with racks on the rack girder, which is stationary. When the bridge opens, it merely rolls backward, and in order to ensure this the segmental girders are meshed into the track girders by means of a form of gearing consisting of square projections about 1 in. high on the track girders, with corresponding recesses in the segmental girders. The angle through which the bridge leaf moves between the closed and open position is approximately 74 degrees. No equalizing gear is interposed between the operating pinions and the motors to balance up the stress of each of the pinions, but two couplings have been provided on the main shaft which had to be drilled in the field after all the gears had been adjusted.

There are two operating motors 37 h.p. 680 r.p.m. 550 volt, 60 cycle, fitted with solenoid brakes. As the motors turn through approximately 74 degrees around an axis parallel to the motor shafts, the bearings have been specially designed. For the same reason it was not possible to fit the solenoid brakes in the usual manner on the end shield, but the solenoid brake has been turned through 45 degrees. This arrangement avoids the solenoids being in a horizontal position when the bridge is open. They are provided with release attachment and automatic trip.

For the operating motors two controllers geared together have been used.

The two end locks are motor operated by a 2 h.p. 1,200 r.p.m. 550 volt, 60 cycle motor. It is fitted with solenoid brake and operates the end locks through worm gearing. It only operates in the horizontal position, but as it moves with the bridge, it was necessary to provide it with special bearings. Provision was also made for operating the end locks by hand, by means of a lever in the operator's cabin. When the end locks have been withdrawn, they are held back by means of catches, and remain in that position during the whole time the bridge is raised. Provision is made for the catches to be knocked out by a stop as the bridge again reaches the nearly closed position. The position of the end locks is indicated in the operator's cabin by means of an indicating lamp, operated through a lock signal switch.

The emergency brake is operated by a 3 h.p. 550 volt, 60 cycle motor, which is geared to a crank disc. A pin on this disc is connected to a lever, which releases the brake mechanism. The brake is normally set by a spring. There is a small solenoid brake on the motor, which sets when current is applied, and releases when current is off, thus operating in the reverse manner to the usual solenoid brake. A drum type limit switch mounted on top of the motor and driven by a sprocket chain from the back shaft of the motor is used to make proper connections. The operation is as follows: Assuming the main brake is set, to release the brake the triple pole line switch on the emergency brake circuit is closed. The motor immediately starts and makes a few revolutions, bringing the crank disc pin to the upper position. When it reaches this point, the limit switch opens the motor circuit and at the same time energizes the solenoid, thus setting the brake on the motor. This holds the motor and prevents it from rotating backwards. So long as the solenoid brake is energized, the main brake is kept in release. To set the brake, the triple pole switch is opened. This deenergizes the solenoid and releases the brake on the motor. The force of the spring on the main brake then immediately pulls around the crank disc and resets the brake.

When the bridge is closed and ready for traffic, the arm of the lock signal switch and the arm of the bridge signal switch are in the position marked "Closed," and the contactors in the circuits of the main operating motors and the lock are open. To open the bridge the first step required is to set the railway signals at "Danger." Until this is done, the lock motor contactors remain open and the end lock cannot be withdrawn. Until the end locks are withdrawn, the contactors of the operating motors remain open and these motors cannot therefore be started.

The action of moving the lever to set the railway signals at "Danger" closes the switch in the railway signal cabin. When this switch is closed, the contactor coils of the lock motor are energized and close the contactors. The circuit breaker is then closed, the controller handle of the lock moved around and the lock withdrawn. As the lock bar moves out it operates the lock signal switch, and this in turn changes the signal lights in the railway signal cabin

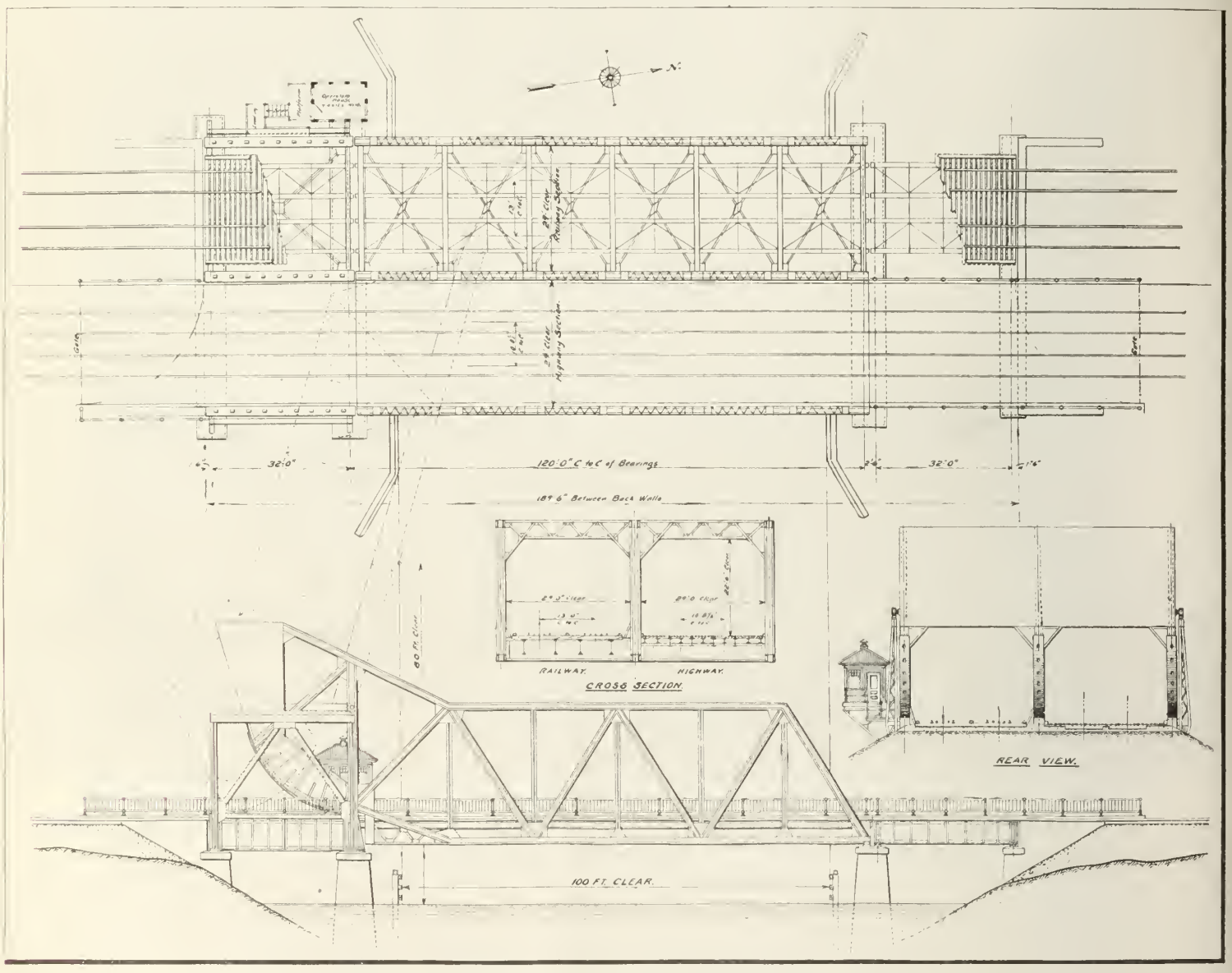
Rolling Lift Bridge Across McKellar River, Fort William, Ont.

from white to red, thus indicating that the bridge is closed to traffic. A similar change in lights takes place on the bridge operator's signal lamp panel, the lights changing from "Lock Closed" to "Lock Open." At the same time the lock signal switch closes the circuit of the operating coils of the contactors in the circuit of the main operating motors.

As soon as the "Lock Open" signal light has shown up, the handle of the controller should be moved to the "off" position and the circuit breaker opened. If the controller handle is not thrown to the "off" position in time, the low voltage release coil of the circuit breaker will be short circuited through a set of contacts on the lock signal switch in series with a set of auxiliary contacts on the controller. It will be noticed that the circuit breaker of the lock motor must either be opened by hand or tripped automatically as above, before the oil switch for the main operating motors can be closed, for the auxiliary switch on the circuit breaker opens the circuit of the low voltage release coil on the oil switch when the circuit breaker is closed.

After closing the oil switch, the emergency brake is released by closing another switch. The main operating motors can then be started and the bridge raised by moving around the handle of the controllers. The first notch on these controllers releases the solenoid brakes only on the motors and this notch can be used at any time when it is desired to allow the bridge to coast. As soon as the bridge starts to open, the arm of the bridge signal switch moves from the position marked "Closed" and thereby opens the contactors in the lock motor circuit. This prevents the end lock being operated while the bridge is open. As long as the bridge is closed the "Fully Closed" light (white) on the signal lamp panel shows up, but as soon as the end of the bridge lifts off the pier this light is extinguished. An auxiliary indicator switch mounted on the end of the moving leaf of the bridge was used for this light, as it was found impossible to obtain a definite indication of the "Closed" position of the bridge by means of the bridge signal switch operated by the movement of the bridge. The remaining lights, however, on the signal lamp panel, which show up in turn as the bridge opens, are operated from contacts on the bridge signal switch. The channel lights, which change from red to green when the bridge opens, are also operated from this switch. If the operator fails to throw the controller handle to the "off" position after the "Nearly Open" signal light has shown up, the low voltage release coil of the oil switch is short circuited by means of a set of contacts in the bridge signal switch in series with contacts in the controller. This arrangement trips the oil switch, cutting off current from the motors and setting the solenoid brakes. If through any cause the switch mechanism should fail to operate and open the switch, an alarm bell, which is connected in place of the usual series resistance of the low voltage release coil, rings continuously until the operator throws the handle of the controller to the "off" position.

In closing the bridge the handle of the main controller is, of course, moved around in the reverse order. No automatic cutoff is used when closing the bridge, as a set of air buffers are provided to prevent shock to the structure when the end of the bridge strikes the pier. If the bridge is travelling too fast, these air buffers will cause the motors to be overloaded and so trip the oil switch. The bridge can, if necessary, be held down on the pier by keeping the controller on the second or third notch until the emergency brake is set, thus holding the bridge in position. The controller handle is then moved to the "off" position and the oil switch is opened. The circuit breaker of the lock motor is then closed and the lock moved into place. In closing the lock, the circuit breaker will also be tripped out, unless the controller handle is moved to the "off" position as soon as the "Lock Closed" signal light shows up.



Rolling Lift Bridge Across McKellar River, Fort William, Ont.
The dotted lines indicate the position of the bridge when open for the passage of vessels.

When the lock is closed all signal lights show up white, indicating that the bridge is safe for traffic. During the times when the bridge is closed and the locks in place, the lock motor circuit breaker is closed so that the auxiliary switch disconnects the alarm bell and low voltage release coil of the oil switch from the 110 volt busses. A set of emergency knife switches is provided on the switchboard panel, which, when closed, cuts out the main motor and lock motor contactors, respectively. These switches are normally sealed in the open position and would only be made use of in case of damage to any of the contactors, or some other emergency condition requiring operation of the bridge independently of the interlocking system.

The bridge signals described above are interlocked with the railway's interlocking system, in such a way that a train would be derailed if it attempted to cross while the bridge was in the open position.

The bridge was erected in the open position by means of a stiff leg derrick mounted on top of a wooden erection tower 125 ft. high. The pouring of the concrete for the counterweight was carried on simultaneously with the erection of the steel, so as to balance the structure at all times during erection.

The current for operating the bridge is obtained from the Kaministiquia Power Co. and is 2,200 volts, 3 phase, 60 cycle a.c., stepped down to 550 volts for use on the bridge.

The electrical control apparatus described is housed in an operator's house on one side of the bridge. The bridge is also equipped with a hand operating mechanism for use in case of an emergency.

The total weight of the steel work and machinery is approximately 660 tons. The bridge was designed by the Scherzer Rolling Lift Bridge Co. of Chicago, under the direction of P. B. Motley, M. Can. Soc. C.E., Engineer of Bridges, C.P.R. It was fabricated by the Bridge Department of Canadian Allis-Chalmers, Ltd., in its Toronto works and all calculations in regard to counterweight, etc., were worked out in its engineering department after the shop drawings were made. The entire electrical equipment was furnished and installed by the Canadian General Electric Co.

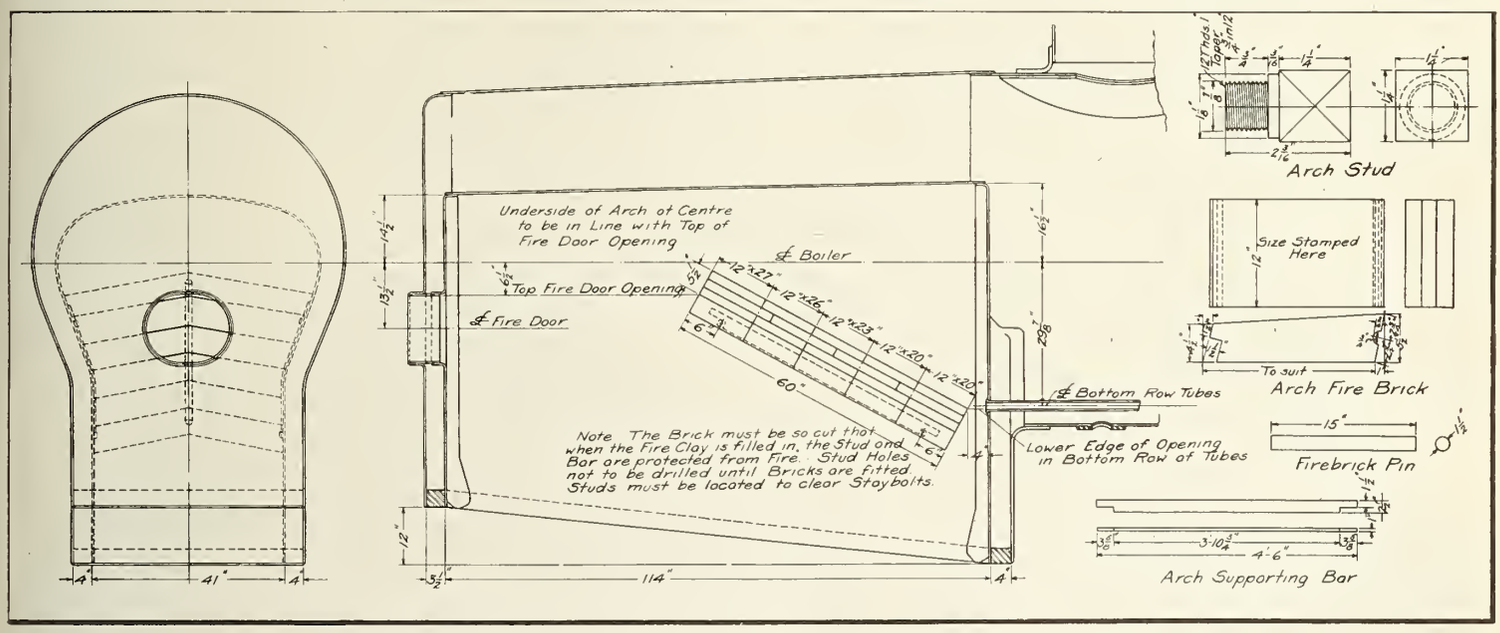
The designers of the bridge, in some information sent Canadian Railway and Marine World, say:—"The counterweight is composed of concrete extending across the bridge from truss to truss. It adds to the rigidity of the entire structure, as it is rigidly attached to the trusses. The segment upon which the bridge rolls, the counterweight and the truss spanning the channel are rigidly riveted together, forming a one piece structure. The bridge operates on the principle of a wheel resting upon a track, except that only a quarter of the wheel or segment is required, because the bridge moves only a comparatively short distance. This makes it unnecessary to have a journal or axle."

Brick Arch for Canadian Northern Railway Locomotives.

The accompanying illustration shows a brick arch arrangement used on the C.N.R. eastern lines for locomotives having narnow fireboxes set on top of the locomotive frames. It contains many points of excellence over the more elaborate arch types, and is used on fireboxes having widths up to 66 ins. The most apparent changes between this type and the more usual design, lie in the elimination of the arch bars, the bricks being of such size and shape as to form the arch in themselves. Each arch consists of 10 bricks, in a row of 5 on each side, slightly arching towards the centre on each side of the firebox. There are two arch studs, fitted to clear the staybolts, on which rest two arch supporting bars, the outer ends of the brick being so formed as to fit on the narrow shelf thus provided. The inner end of each brick is channeled to receive the half of a 1½ in. firebox pin, securely locking the arch together by its own weight. The bricks have a width of 12 ins., forming an arch 60 ins. deep. The locking pins are 15 ins. long, locking each pair of pins to its adjoining mates. Another type of central mating joint is employed in special cases, of the tongued and grooved type, dispensing with the locking pins. This tongue and groove are of the same dimensions as the locking pin.

The good points claimed by the railway officials for this type of arch are that flat bricks are used, which are easily made, have a low initial cost, pile readily and are easily packed in cars without damage in transit. The same bricks are used on all locomotives, apart from the length, which varies. The arch is supported on each side by a bar, and two studs instead of four, reducing the risk of leaking to a minimum. It is 15% lighter in weight than the usual arched type, and it is easily applied and maintained.

In applying, the bricks are so cut that when the fireclay is filled in the side crevices, the stud and bar are protected from direct contact with the fire. From its construction, it is a very simple matter to apply the arch, and, if required, to remove it, leaving the firebox in its former condition. To date 16 sizes of brick have been used, on two classes of locomotives.



Brick Arch for Canadian Northern Ry. Locomotives, Showing Details of Construction.

The C.P.R. "better farming" special trains, operated in connection with the Manitoba Government, which went on duty recently, contain specimens of noxious weeds most troublesome in the province, and lectures are given to teach the effectual methods of eradication. There are models of weed seeds, so that identification is easy; Manitoba birds, with instructions as to their habits, whether destructive or beneficial; injurious insects are illustrated on the moving films; a car with cattle, sheep and pigs in connection with which lectures will be given to young men, especially; a car devoted to home economics for women, where lady demonstrators teach nursing, sewing, and so forth. Field crops and miniature lay-outs of farm buildings are shown in two cars, while instruction is given as to the protection of such buildings. In Saskatchewan two large cars are devoted to stock, and instruction will be given in everything practically appertaining to farm life.

The Pennsylvania Rd. has issued an order prohibiting train employes from manipulating the lower hand brakes on freight cars by means of brake clubs, investigation having proved that the careless use of clubs on the lower brakes, or "tunnel" brakes as they are called in railway parlance, resulted in one employe being killed.

The C.P.R. pension fund now has at its credit nearly $750,000, and there are 605 pensioners. Last year the payments to pensioners were $169,329, and during the year the C.P.R. contributed $125,000 to the fund.

The Construction of the Campbellford, Lake Ontario and Western Railway.

A new line 182.6 miles long is the main feature of an improvement just completed which, in conjunction with double tracking done during the last five years, gives the C.P.R. two tracks all the way from Montreal to Toronto. The new line, built as the Campbellford, Lake Ontario & Western Ry., has ruling gradients of 0.4% each way, and takes the place of a second track along the old route through Havelock and Peterboro, which has ruling grades of 1.1% in each direction that could not be reduced to 0.4% except at a prohibitive cost. Incidentally the new line taps some new territory and touches a number of good-sized places on the shore of Lake Ontario that the C.P.R. has not hitherto reached.

From Montreal to North Toronto via the old line is 335.7 miles. The territory is shown on the accompanying map. For operating purposes there are three subdivisions, namely, from Montreal to Smiths Falls, 128.7 miles; from Smiths Falls to Havelock, 109.2 miles, and from Havelock to North Toronto, 97.8 miles. The first or Smiths Falls subdivision was first double tracked, this work being completed late in 1909. The alignment on this section was already good and the ruling gradient of 1% was reduced to 0.3% eastbound and 0.4% westbound.

Growth of business made some relief of the single track between Smiths Falls and Toronto imperative. Surveys completed in 1911 developed the fact that even with long diversions it was impossible to reduce materially at any reasonable cost the gradients on the existing line, but it was found that on the new location shown between Glen Tay, 15.5 miles west of Smiths Falls, and Agincourt, 10.5 miles east of North Toronto, a new line 1.6 miles longer than the old, but with 0.4% ruling grades each way, was feasible. The section from Smiths Falls to Glen Tay was double tracked in 1911, the work being fairly light. Heavy grading was necessary between Agincourt and North Toronto in order to get the grades down to the desired maximum, and this portion of the double tracking also entailed the construction of two large viaducts. This work was started in June, 1913, and is nearing completion.

Starting from Glen Tay, the new line, after traversing a few miles of agricultural country, strikes into a rocky section, lightly timbered and abounding in lakes. In these 34 miles is the heaviest grading. Reaching an arm of Lake Ontario at Belleville, the route is near the shore until within 20 miles of Agincourt, and is situated in what is considered one of the best farming districts in Ontario. Seven important towns are reached, and particular attention has been paid to securing in each place a location favorable from a traffic standpoint.

This line is built with a maximum curve of 4 deg., spirals of 100 ft. in length per degree of curve being used in all cases. The average curvature is 20 deg. per mile. While the ruling gradients are virtually 0.4% in each direction, velocity grades were used where economy suggested them. Curves are compensated 0.04 ft. per degree of central angle. Vertical curves are 100 ft. long per 0.05% change of grade in sags and per 0.1% change on summits. All grades at, approaching and leaving passing sidings are reduced to 0.3% compensated for a distance of 3,000 ft. from either end of the siding.

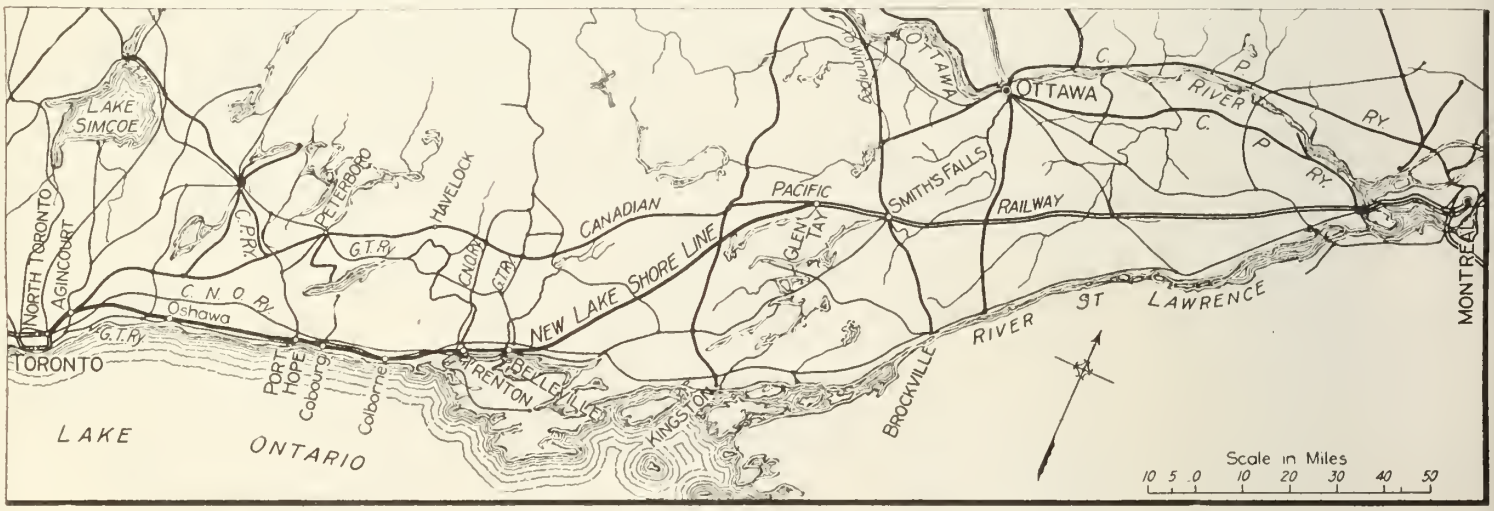
In general the right of way is 100 ft. wide. Embankments up to 16 ft. high are 16 ft. wide; higher ones are 18 ft. wide. Slopes of fills are 1½ to 1 for earth and 1¼ to 1 for rock. Earth and rock cuts are respectively 22 ft. wide, with 1½ to 1 slope, and 20 ft. wide, with ¼ to 1 slope. Both in the purchase of right of way and in the grading account was taken of the probability of future double tracking, sufficient land for the purpose being bought where possible, embankments and cuts being made for the additional track in preference to wasting or borrowing material.

All bridges and culverts are of concrete and steel construction. Of the steel structures the principal ones are that over the Ganeraska River at Port Hope, 1,800 ft. long; that over the Trent River and Canal, 1,493 ft. long; that over Mud Lake, 964 ft. long, and that over Dixie Creek, 916 ft. long. Most of these are of viaduct construction, with few spans greater than 90 ft.

The greatest difficulties were encountered at Mud Lake crossing, near the eastern end of the new line. Two 241 ft. trusses span the lake proper with a pier in the centre. A short girder span leads to the top of the east bank, several viaduct spans constituting the west approach. The lake itself is only 2 or 3 ft. deep, but the bed is a mass of semi liquid mud some 20 ft. deep, under which a thick stratum of blue clay, very soft at the top, and thin layers of sand, gravel and hardpan made it necessary to carry the centre pier down to a depth of 103 ft. below the water level to reach solid rock. The pier on the west shore also had to be carried down 56 ft., and the next one 30 ft. These three piers were sunk under air pressure, using reinforced concrete caissons with steel cutting edges.

The objection to grade crossings on this line is naturally not as acute as in more populous regions. Of 17 railway crossings and 293 highway crossings, 7 and 225 respectively are at grade. For operating purposes Trenton, which is midway between Smiths Falls and North Toronto, has been made a division point, and a yard and shops have been built there. Passing sidings are 3,000 ft. long and are about 6 miles apart. The track is laid on cedar, hemlock, tamarack and jack pine ties in 18 in. of gravel ballast with 85 lb rail.

Quantities on the work include 7,500,000 cu. yd. of grading, of which 1,300,000 cu. yd. were solid rock, 100,000 cu. yd. of masonry and 15,200,000 lb. of steel. The cost has conformed closely to the estimate, which was $11,000,000, or approximately $60,000 a mile. The work was done under the direction of C. W. P. Ramsey, Engineer of Construction, and P. B. Motley, Engineer of Bridges, C.P.R.—Engineering Record.



Territory from Montreal to Toronto and Relation of New Line to the C.P.R.'s Original Line.

A Conductor's Excusable Repartee.

Howard Elliott, Chairman of the New Haven lines, said at a dinner in New York recently:—

"I don't encourage back talk among our employes—far from it—but I must say my sympathies are rather with one of our conductors who ventured under great provocation, on a little back talk the other day.

"As the conductor was punching tickets, a man said to him, with a nasty sneer:—

"'You have a lot of wrecks on this road, don't you?'

"'Oh, no,' said the conductor. 'You're the first I've seen for some time.'"

Locomotive Rescued.—In the autumn of 1913 a C. P. R. locomotive left the track near Rossport, Ont., and ran into Lake Superior, sinking in 60 ft. of water. The Canadian Towing and Wrecking Co. undertook to raise the locomotive, and replace it on the tracks. This novel piece of salving work was reported accomplished recently, and repairs are now being made in the locomotive shops.

Seventy-Five Ton Pit Car for Canadian Pacific Railway.

The accompanying illustrations show a 75 ton pit car, which the C. P. R. has had built recently to handle heavy structural and machinery parts. The Canadian General Electric Co. had requisitioned the C.P.R. for special cars to transport electrical machinery, such as transformers, etc., designs for which were prepared. Before actual work on these cars had commenced, the St. Lawrence Bridge Co. also applied to the C.P.R. for some heavy cars to handle the heavy steel members to be used in the Quebec bridge, all of which are being fabricated in the bridge company's shops at Lachine, Que., and must be transported to Quebec. The initial designs for the heavy cars were therefore modified so as to produce a car that would meet the requirements of both services, and are now such that they may be employed in ordinary heavy traffic when the special requirements for which they have been built are met. An order of six has been completed.

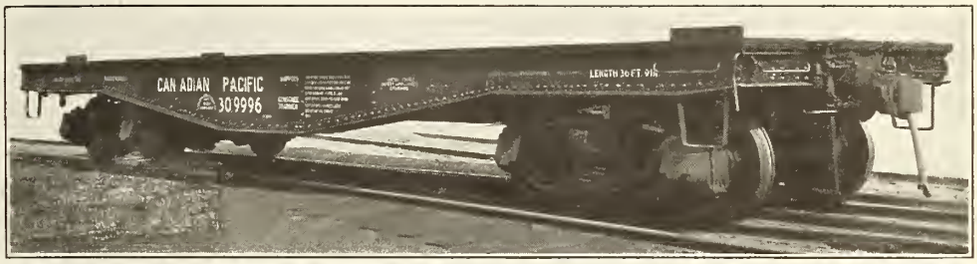
The bridge requirements called for a car that would carry members weighing 130,000 lbs., and 16 ft. high. The clearance limit made necessary the pit construction. Following are the principal dimensions:—

Length	36¾ ft.
Width	10 ft.
Top of rail to top of deck	4 ft. 2¼ ins.
Truck centres	26½ ft.
Truck wheel base	5½ ft.
Length of pit	18 ft. 1 in.
Width of pit	6 ft.
Wheels	33 in. rolled steel
Journals	6 by 11 ins.
Draft gear	Twin M.C.B. class G springs
Load limit	150,000 lbs.
Average tare weight	48,000 lbs.

The pit cover is made in two pieces, and when the open pit is required, the two parts of the cover are carried on the ends of the car, where they are held in place by stakes and large steel angles rivetted to the deck. The covers are composed of heavy wooden decking attached to steel I beams, the ends of which are equipped with cast steel lugs, resting on the top of longitudinal sills. The entire top of the car is covered with heavy wooden decking, and is provided with holes for bolting down blocking for the loads. When the pit covers are in place, the car presents the appearance on top of the ordinary flat car.

Each car has two complete sets of brakes, one for each truck. They are of the Canadian Westinghouse Co.'s schedule K.D. 812. The cars were designed in the office of R. W. Burnett, General Master Car Builder, to whom we are indebted for the data on which the foregoing information was compiled, and they were built by the Canadian Car and Foundry Co.

We are officially advised that the four 75 ton pit cars, which the Intercolonial Railway has ordered from the Eastern Car Co., Ltd., will be exactly the same as the C.P.R. cars above described.



C.P.R. 75 Ton Pit Car for Carrying Heavy Bridge Members Up to 16 ft. Deep.

Work Train Service at a Gravel Pit.

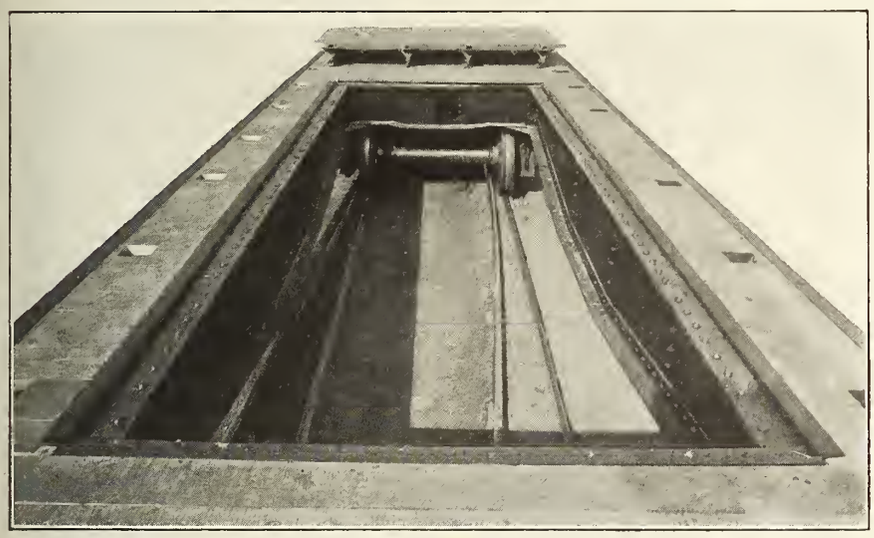
By T. Hickey, Roadmaster, Michigan Central Road. St. Thomas, Ont.

The cars and appliances necessary for proposed work should be switched on some track together, where they can be readily picked up by the work train crew at the time ordered. Cars are liable to get blocked in large yards, causing serious delay both to the train crew and to laborers expected to do the work. I arrange, when necessary, for an auxiliary tank to be attached to the work train locomotive, to serve as an additional water supply. I find this to be a saving in time, that may otherwise mean considerable delay to the work. All work should be done under the direction of an assistant roadmaster, or an experienced foreman, understanding fully the work to be done.

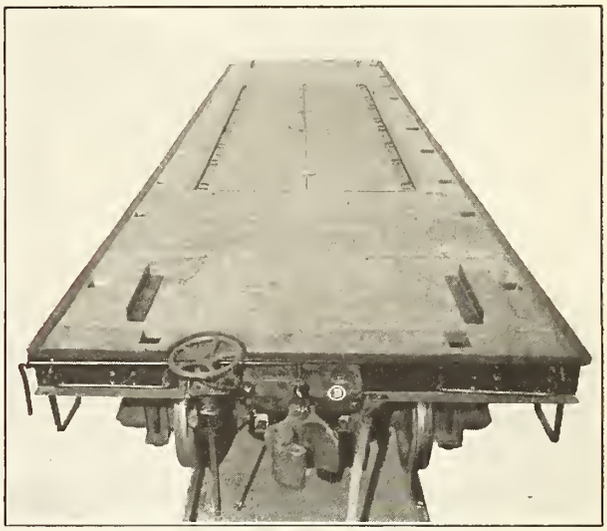
The proper handling of the work and work trains depends primarily upon the amount and kind of work to be done, as well as the length of haul of material and other general conditions. I have a gravel pit, 2½ miles from the main track, from which a great deal of material has been taken for the past 12 years, and more particularly during the past 4 years. The haul on this material was 45 miles, over 15 miles of single and 30 miles of double track.

A certain class of locomotives suitable for the work are requested and also certain enginemen and train conductors who have been tried before in this service. A water plant is provided at the pit sufficient to supply the steam shovel and pit locomotive, and occasionally one of the road locomotives, when necessary. A telegraph office is also located in the pit, from which all conductors leaving the pit receive train orders. A car repairer is stationed here to do the necessary oiling of cars and make other light repairs. One locomotive and crew is stationed in the pit with the steam shovel and two crews are assigned to hauling, each train containing 50 cars. The shovel loads 150 cars each day, or about 2,250 cu. yds. There is scarcely any failure in making this daily average, and each hauling crew makes 135 miles a day, or a trip and a half.

The time that the first train leaves the pit each morning, as well as the place of unloading, is well understood, not only by the train crews, but by all others interested in the work, with the result that each crew makes its trips regularly. The pit conductor is in full charge of the work in the pit. He makes a daily inspection of material and supplies on hand and orders additions in sufficient time to prevent the supply becoming entirely exhausted.—Railway Age Gazette.



Open Pit in C.P.R. 75 Ton Pit Car.



C.P.R. Pit Car as Ordinary Flat Car.

Life of Locomotives and Passenger Cars.—It is estimated by the Pennsylvania Rd. that passenger cars and locomotives have a useful life of 20 years, at the end of which time their value as scrap will be only about 20% of their original cost. An allowance of 3% for depreciation and renewal is made for freight cars and of 4% for locomotives and passenger cars. Because of the absence of sufficiently lengthy experience in steel cars, an allowance of 4% is made for depreciation and renewal.

The Royal Canadian Humane Association's medal was presented recently to L. B. O. Wakelam, a C.P.R. employe, for saving two lives at a railway crossing accident at Port Burwell, Ont., in January last.

Coaling Plants on the National Transcontinental Railway.

The National Transcontinental Ry. Commission placed a contract recently for six coaling stations at Monk, Bridge, Fitzpatrick, Parent, Doucet and O'Brien, Que. The plants will be of the mechanical type, as illustrated herewith, which has been adopted as a standard on the N.T.R., displacing the previously accepted standard coaling plant, of the ramp type, which was described and illustrated in Canadian Railway and Marine World for March, 1913.

Fig. 1 shows the coaling station as it will be actually built, the completed structure to a slightly different design being shown in fig. 2, which shows a U.S. installation built by the same contractors. The structure is entirely of reinforced concrete, the intention being to make them absolutely fireproof. The coal pockets are 23 ft. square, with an average depth of coal of 17 ft., the capacity being 200 tons of run of mine coal, without trimming. The coal pocket is a concrete shell, the floor of which slopes at an angle of about 30 degrees to the horizontal, towards the outer side, and with the top covered with a steel framing sheathed galvanized iron. The 6 supporting columns for this pocket are also of reinforced concrete, at 21 ft. 5 in. centres across the tracks, and 10 ft. 10 in. centres parallel with the track. The coal pocket spans one delivery track, the other delivery track being along the depressed side of the coal pocket bottom. The delivery spouts are in either end of the pocket depression.

At the back of the pocket is located the receiving hopper, consisting of a concrete lined, sloping floor hopper, the slope of which corresponds with that in the upper hopper. The coal intended for the coaling plant is delivered on cars, which are run over top of the receiving hopper, on tracks supported on I beams, and dumped into it. This hopper is 20 ft. long and 15 ft. wide, the slope of the bottom being in three directions, all tending to throw the coal towards an opening at the front. Immediately in front of this opening in the receiving hopper there is located a large steel revolving feeder, which is in reality a gate, a chute and a feeder. This feeder delivers coal in measured quantities automatically to a 2½ ton bucket. The bucket is 5 ft. square and has an apron or folding chute on the front side, to prevent the accidental opening of which there is a roller attached to it, which bears against a guide extending from the bottom of the pit to the dumping point over the bin. As the bucket descends into the pit in front of the revolving hopper, it engages a bar which operates the revolving feeder, causing the feeder to cut off the flow of coal from the receiving hopper and discharge its contents into the bucket. As the bucket rises in the hoistway it revolves the feeder, allowing the coal to flow into it from the receiving hopper.

The hoistway is a structural steel frame, entirely enclosed in galvanized sheathing, and has a total height of 70 ft. above the ground, as well as extending to the bottom

Fig. 3.—Sand Drying Auxiliary to Coaling Plant, N.T.R.

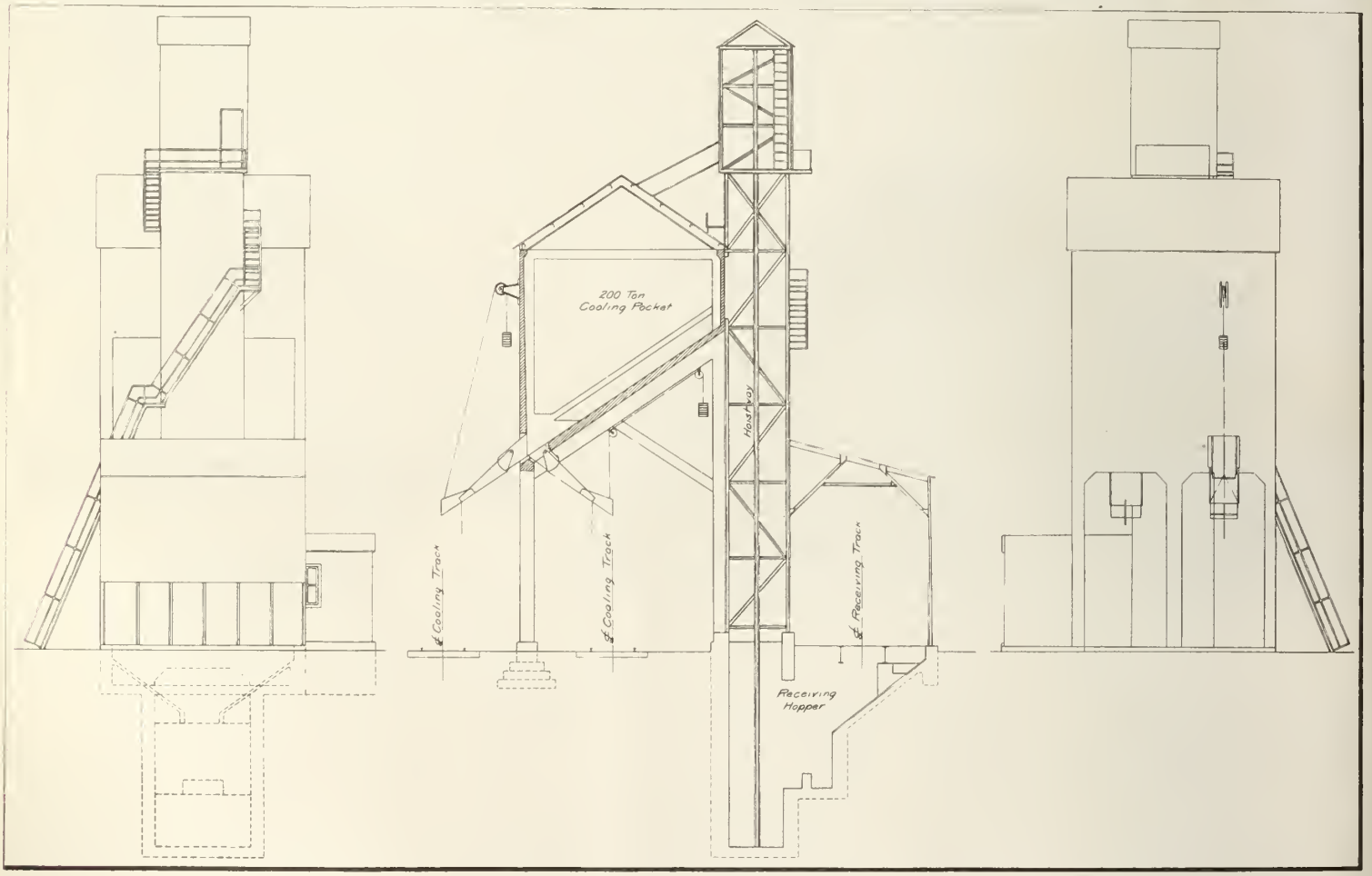


Fig. 1.—Typical Coaling Plant on the National Transcontinental Ry., Six of Which Are Being Built.

of the receiving hopper pit. The bucket travels in this hoistway, between vertical steel guides, and as it reaches the top of the pocket the folding apron opens out over the bin, and the load of coal is discharged down a chute into the bin. The hoist cable is a ⅞ in. steel rope, running over sheaves.

The power used is electrical, derived from a hoist motor of heavy construction, which has on one end an electrically operated or solenoid brake, and on the other end a cut cast steel pinion of the herringbone type, which reduces noise at high speed, and eliminates end motion in the motor. The motor is automatically operated and reversed by means of a special automatic skip hoist controller. This makes the operation of the hoist continuous for as long a period as it is desired to hoist coal, once the controller has been thrown into engagement, thereby leaving the operator free to work about the plant while the coal is being elevated, reducing the operating cost. This equipment is all contained in a reinforced concrete house.

Beneath the lower edge of the upper hopper there are two undercut gates and steel aprons, one to the under track, and the

Fig. 2.—Coaling Plant Similar to N.T.R. Design.

other to the outer track, one at each end of the hopper. These aprons are both counterweighted for ease in handling, and are provided with hoods so that the coal may be deflected downward into the centre of the tender.

Each coaling plant has a sand drying equipment, similar to that shown in fig. 3. This equipment consists of a wet sand storage, drying building, and dry sand storage. The wet sand storage bin is made of heavy posts and planking, cross braced with tie rods, and will hold 50 tons of wet sand. Adjacent to the wet sand bin there is a reinforced concrete sand drying house, equipped with a sand dryer, into which the wet sand is shovelled. The dryer has a capacity of about 10 tons a day. After drying, the sand is shovelled into a steel air drum, of about one cubic foot capacity, from which it is forced up through a 2½ in. pipe by compressed air at from 80 to 100 lbs. pressure, into a concrete pocket, formed by cutting off one corner of the coal pocket.

We are indebted to W. J. Press, Mechanical Engineer, N.T.R., for the information on which this article is based.

Birthdays of Transportation Men in August.

Many happy returns of the day to:—

V. T. Bartram, ex-Purchasing Agent, Timiskaming and Northern Ontario Ry., now of Toronto, born at Ottawa, Aug. 2, 1880.

C. B. Brown, A.M. Can. Soc. C.E., Chief Engineer, Canadian Government Railways, Moncton, N.B., born at Ithaca, N.Y., Aug. 27, 1879.

J. F. Chapman, Manager, Thousand Islands Ry., and Oshawa Ry., Gananoque, Ont., born at Frankford, Hastings Co., Ont., Aug. 25, 1863.

A. E. H. Chesley, General Accountant, Dominion Atlantic Ry., Kentville, N.S., born near Annapolis Royal, N.S., Aug. 27, 1877.

A. B. Chown, Travelling Passenger Agent, G.T.R., Pittsburg, Pa., born at Belleville, Ont., Aug. 4, 1887.

C. H. N. Connell, Engineer Maintenance of Way, Canadian Northern Quebec and Quebec and Lake St. John Rys., Quebec, born at Woodstock, N.B., Aug. 26, 1876.

E. L. Desjardins, Assistant Superintendent, Montreal and Ste. Flavie District, Intercolonial Ry., Riviere du Loup, Que., born at St. Jean Port Joli, Que., Aug. 1, 1859.

L. C. Fritch, Assistant to President, Canadian Northern Ry., Toronto, born at Springfield, Ill., Aug. 11, 1869.

G. H. Ham, Head Office Department, C. P.R., Montreal, born at Trenton, Ont., Aug. 23, 1847.

W. P. Hinton, Assistant Passenger Traffic Manager, G.T. Pacific Ry., Winnipeg, born at Hintonburg, Ont., Aug. 30, 1871.

R. Kerr, ex-Passenger Traffic Manager, C. P.R., born at Toronto, Aug., 1845.

J. D. McDonald, Assistant General Passenger Agent, G.T.R., Chicago, Ill., born at Toronto, Aug. 27, 1855.

T. McHattie, Master Mechanic, Eastern Division, G.T.R., Montreal, born at Dufftown, Banffshire, Scotland, Aug. 8, 1854.

M. K. McQuarrie, Resident Engineer, District 1, British Columbia Division, C.P.R., Revelstoke, born at Sault Ste. Marie, Ont., Aug. 17, 1884.

J. A. Marsh, Trainmaster, British Columbia Electric Ry., New Westminster, B.C., born at Dresden, Ont., Aug. 16, 1876.

J. M. Maver, Contracting Freight Agent, Northern Pacific Ry., Montreal, born at Toronto, Aug. 9, 1884.

W. J. Meakin, Locomotive Foreman, C.P. R., Coronation, Alta., born at Toronto, Aug. 22, 1869.

C. Montgomery, Master Mechanic, Pere Marquette Rd., St. Thomas, Ont., born near London, Ont., Aug. 29, 1860.

W. E. Mullins, General Manager, Costa Rica Division, United Fruit Co., San Jose, Costa Rica, born at Stratford, Ont., Aug. 13, 1870.

H. R. Naylor, Division Car Foreman, Eastern Division, C.P.R., Montreal, born at Hull, Eng., Aug. 30, 1885.

F. H. Phippen, K.C., General Counsel, C. N.R., Toronto, born at Belleville, Ont., Aug. 26, 1862.

W. M. Porteous, District Freight Agent, C.P.R., St. Louis, Mo., born at Edinburgh, Scotland, Aug. 3, 1857.

J. F. Richardson, Superintendent Telegraphs, British Columbia Division C.P.R., Vancouver, born at Granby, Que., Aug. 23, 1861.

W. G. Ross, Chairman Montreal Harbor Commissioners, born at Montreal, Aug. 6, 1873.

W. Le B. Ross, Local Treasurer, G.T. Pacific Ry., Winnipeg, born at Ottawa, Ont., Aug. 9, 1868.

Major Salt, Car Foreman, C.P.R., Toronto, born at Lichfield, Eng., Aug. 12, 1859.

F. C. Salter, European Traffic Manager, G.T.R., and Canadian Ex. Co., London, Eng., born at Sarnia, Ont., Aug. 31, 1863.

C. R Scoles, General Manager, Quebec Oriental Ry., New Carlisle, Que., born at Grantham, Lincoln, Eng., Aug. 27, 1856.

S. A. Simpson, Superintendent, Sleeping, Dining and Parlor Cars and News Service, District 3, C.P.R., Winnipeg, born at Toronto, Aug. 22, 1880.

W. Stitt, General Passenger Agent, C.P. R., Eastern Lines, Montreal, born in Kirkcudbrightshire, Scotland, Aug. 3, 1855.

J. F. Sweeting, Industrial Agent, Natural Resources Department, C.P.R., Calgary, Alta., born at Worthing, Eng., Aug. 20, 1872.

W. F. Taylor, General Storekeeper, Intercolonial Ry., Moncton, N.B., born at Hillsboro, N.B., Aug. 20, 1855.

Capt. F. J. Thomson, s.s. Royal George, Canadian Northern Steamships, Ltd., born in Cheshire, Eng., Aug. 20, 1876.

F. E. Warren, General Car Foreman, C.P. R., Winnipeg, born at Chelsea, Que., Aug. 29, 1872.

W. B. Way, Superintendent District 1, Eastern Division, C. P. R., Farnham, Que., born at Bowmanville, Ont., Aug. 22, 1867.

E. H. Williams, Locomotive Foreman, Canadian Northern Ry., Brandon, Man., born at West Toronto, Ont., Aug. 26, 1844.

Dominion Expenditures on Railways and Canals.

The Minister of Finance in his budget speech in the House of Commons recently, stated that the capital and special outlays for the financial year totalled $32,396,816.37, of which the following amounts were expenditures on railways and canals:—National Transcontinental Ry., $13,767,011.44; Quebec bridge, $1,512,825.96; Hudson Bay Ry., $1,099,063.15; other railways, $2,509,988.00; railway subsidies, $4,935,507.25; canals, $2,259,257.45. The Government invested, under parliamentary authority, over $11,000,000 in Grand Trunk Pacific Ry. bonds, and $2,000,000 in Montreal harbor debentures. During the year $19,000,000 was expended on special railway subsidies to the lines included in the Canadian Northern Ry. system, and a loan of $15,000,000 was authorized to the Grand Trunk Pacific Ry. The estimated expenditures for 1913-14, on capital account, for railways, canals and other special accounts is $57,000,000. The special outlays and investments for which it was necessary to borrow during the past fiscal year were:—Railway subsidies and other charges, $20,000,000; investment in G. T. Pacific Ry. bonds guaranteed by the Dominion, $12,872,333.27; G. T. P. loan, $8,500,000; advances to Montreal and Quebec Harbor Commissioners, $5,312,000.

Level Crossings Elimination Fund.—On the third reading of the bill amending the Railway Act having reference to the administration of the fund for the elimination of level crossings, in the House of Commons recently, the acting Minister of Railways said the total amount paid out of the fund to April 1, under orders of the Board of Railway Commissioners was $87,640.03. The Commissioners had ordered payments to be made in connection with the elimination of 94 more crossings. The bill provides for the provision of $200,000 a year for five years, from April 1, out of which is to be paid such sums as may be directed by the Board in aid of the elimination of level crossings. The amount to be expended in any one year is not to exceed $200,000, and not more than $5,000 can be paid in respect of any one crossing.

Railway Mechanical Methods and Devices.

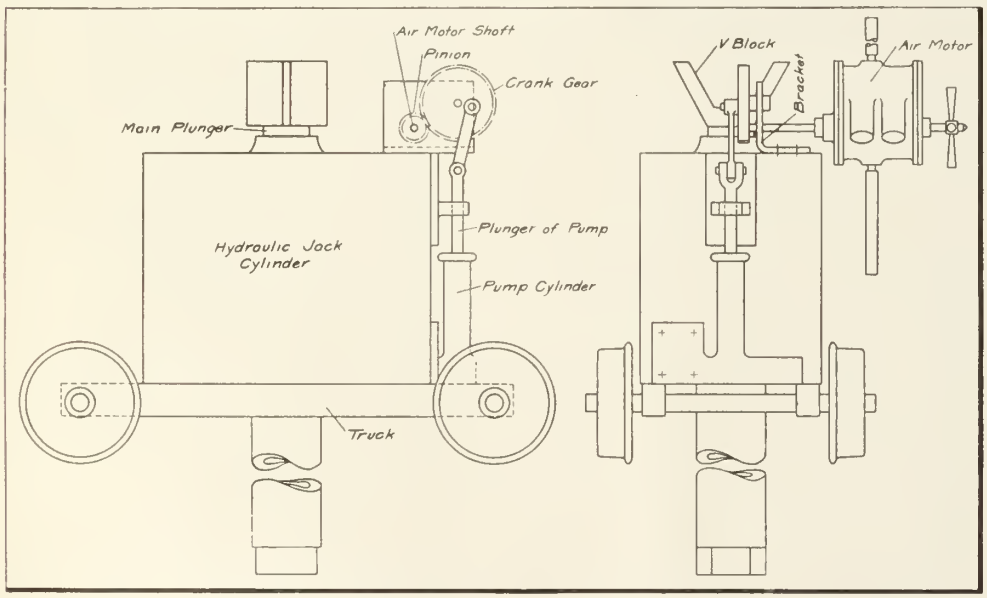
Hydraulic Jack Pit in Toronto, Hamilton and Buffalo Railway Shops.

The use of a drop pit in locomotive houses, for the dropping out of a pair of driving wheels for repairs, is quite general practice at points some distance from the back shop, as there are minor repairs which can be attended to, such as renewing the driving wheel brasses. To handle this work the drop pit is usually of the hydraulic type, with a travelling carriage on which the hydraulic cylinder is mounted.

In some of the smaller shops, where it has been found necessary to make the most of limited facilities, from the fact that conditions would not warrant the installation of expensive overhead travelling cranes, such as are found in large railway repair shops, or special wheeling cranes, to be found in a number of the medium sized shops, the locomotive house arrangement includes a pit with wheeling jack therein, which is sometimes employed as a satisfactory substitute. This is the case in the Toronto, Hamilton and Buffalo Ry. shops at Hamilton, Ont., where the repair track drop pit is equipped with a hydraulic wheeling jack, located in a cross pit to the repair pit track, so that the wheels can be run out on the jack truck, and run on track to the wheel lathe.

The operation of a hydraulic lift jack by hand is a slow and tedious task for the workmen, especially when lifting a pair of wheels from a very large locomotive. The hydraulic jack in the accompanying illustration, when hand operated, required two men on the end of a 4 ft. lever to raise a heavy pair of wheels into position. The jack was converted from hand to power operation by M. J. Hayes, General Foreman, the manner of converting the jack being clearly shown in the illustration. The hand lever arrangement connecting to the top of the pump plunger was removed. To the top of the hydraulic jack cylinder was attached a bent sheet steel bracket, to which were pinned an intermeshing gear and pinion, in a 4 to 1 ratio. The gear has a crank pin with a 1 in. throw, connecting through a connecting rod with the top of the plunger rod. The pinion was keyed to the end of a shaft which passes through the bracket, the other end of this shaft having a no. 3 Morse taper. An air motor on the end of this shaft provides the motive power. With but one operator under this scheme, the jack operates five times as fast, introducing a considerable saving.

While the use of air directly, in large area cylinders, as a means of lifting the driving wheels, has been employed in many shops, there appears to be a general opinion against its use, on account of its non-dependability, the lifting or lowing of weights by such a jack being more or less jerky, owing to the changeable volume of the lifting medium. With water as the medium no jerky movements occur.



Air Operated Hydraulic Drop Pit Jack.

Hydraulic Tire Rivetter in Grand Trunk Railway Shops, Montreal.

The accompanying illustration shows a hydraulic locomotive tire rivetter in use in the G.T.R. locomotive shops at Montreal, for removing tire rivets and rivetting the new ones. It is of a punch frame construction, with a throat opening just large enough for convenient working over the tire. It is a steel casting, heavy, not only in the flanges, but also in the web, designed throughout for heavy service. Both ends have hydraulic plungers, controlled from a valve over the cylinder on the far end of the casting, as shown, the control levers being conveniently located thereon.

Hydraulic Tire Rivetter in G.T.R. Locomotive Shops.

The rivetter is suspended by a swivel joint from an overhead jib crane, swinging over top of one of the wheel tracks, where it can be readily manipulated for the several operations, without requiring the frequent shifting of the wheels themselves. The hydraulic hose connection is also swivelled, for the sake of convenience, and the hose is armored. This rivetter is in use under the direction of J. Hunter, Foreman, Wheel and Tender Shop.

Preventing Wear of Concrete Floors.

About the only objection to the ordinary concrete floor is the fact that the wear to which it is subject—that is, the purely mechanical attrition—causes dust. This may, however, be avoided by scrubbing the floor with a stiff brush or broom, letting it dry, and then laying on a coat of a solution of water glass, in three to four times its volume of water. The solution is applied with a long handled whitewash brush. The more dense the concrete, the thinner the solution may be, and no more of it should be made than can be applied in an hour. When the floor is again dry, it should be scrubbed with water and a coarse cloth. Then a second and a third coat of water glass solution should be applied, each time letting the floor dry, scouring it with clean water and a heavy cloth. The water glass should soak into the pores of the concrete and form with the alkali therein an insoluble chemical compound. Any water glass that remains on the surface is unchanged, and can be washed or scrubbed away. This treatment will increase the durability of the concrete, and make it much more desirable as a floor material.—R. Grimshaw, in Machinery, N.Y.

Slotter Kinks in Quebec Central Railway Shops.

In small railway repair shops many makeshifts are required from time to time, if all the sundry repair jobs that must be encountered are to be successfully dealt with. The machine tool equipment must, of necessity, be much smaller than in a large shop, the same machine being used for a multiplicity of duties, whereas in larger shops there are special machines for most of the important operations. In the smaller shops the equipment in many cases was provided originally for the smaller motive power in use a few years ago. In the larger shops this lighter and smaller equipment still can be successfully used, by placing in some department where lighter work is to be handled. In the small shop all classes must he handled with a very limited number of machines, there being no special departments. Such is the case of the Quebec Central Ry., a line handling a very heavy freight traffic, which has been developed rapidly within recent years, through the opening up of the numerous asbestos mines along the route. To meet this traffic, much of which can be run through in heavy trains, some fairly heavy motive power is used, which taxes the shop facilities to the limit.

The shaper used in the shops is rather too small for the larger work, especially as it is used for cutting the keyways in the large locomotive driving wheels. For the ordinary run of work the member to be machined can be placed in the machine manually, but for the larger members, as there happened to be no overhead crane, special provision had to be made. This consists of a small wooden trestle, about 7 ft. high and 8 ft. long, which can be shifted from point to point with facility. When necessary to lift a driving wheel into the slotter the trestle is placed straddling the slotter table, and with a block and tackle the driving wheel can be lifted into place.

For the larger driving wheels the throat depth of the slotter is not quite sufficient to take in the wheel for slotting the keyway. In consequence it was found necessary to increase the throat depth by the expedient of using an offset tool holder, which for the largest size of wheels is about 6 ins. offset. This handles the largest work satisfactorily. E. M. Green is General Foreman, Machine Shop.

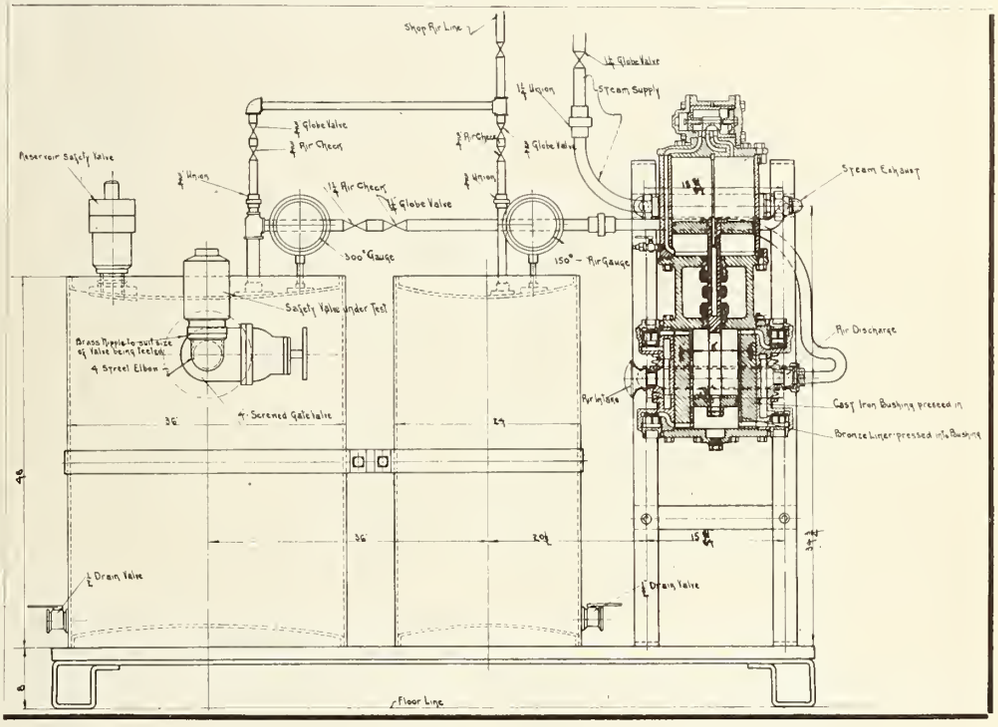
Safety Valve Tester on Canadian Northern Railway.

For testing of safety valves the C.N.R. mechanical department has developed an apparatus that, from the standpoint of simplicity, has much to commend it. In the arrangement there is nothing but standard equipment, or parts that can be readily made in any shop.

In testing safety valves it is essential that a high pressure be available, and as this is seldom to be had in the ordinary shop, from the fact that but little occasion to use high pressure arises, it is necessary to have it generated. The method employed in this C.N.R. arrangement is to use a standard locomotive air compressor unit, and bush the air cylinder so as to secure the high pressure desired, this high air pressure being utilized to test the safety valve, air being equally as satisfactory as steam for this purpose.

By bushing the air cylinder to a diameter of about half, the air pressure produced is about four times as great, using the same steam end. In this installation the air end has been reduced in diameter by pressing in a cast iron sleeve, within which is a pressed bronze sleeve, ⅜ in. thick, the inner diameter of which is 5 ins. The piston is of similar design to that replaced, but of smaller diameter. Most shops have a steam line shop pressure of about 100 lbs., which makes possible a pressure in the air cylinder in the neighborhood of 400 lbs., which is in excess of that required to test the usual safety valve, allowing a certain degree of reserve capacity.

The air reservoir space consists of two ⅜ in. steel plate cylinders, one 20½ ins. diameter, and the other 36 ins., both 48 ins. long, standing on end. While this provides a fairly large air reservoir, it has been found to be not quite sufficient to provide the uniformity of pressure necessary to correctly test the valve. In consequence, it is the intention to increase the size of the reservoir space in the next design evolved.



Safety Valve Testing Installation on Canadian Northern Ry.

The shop line, containing a control valve, divides, with a connection to each reservoir cylinder, each branch containing a control valve and a check valve. Air from the pump is delivered to the branch into the larger cylinder. In operation the tanks are first filled from the shop air line, to the pressure in that line. Then, the connection from the air pump is opened, and the cylinders filled to the desired pressure, when the valve may be tested by attaching to the 4 in. elbow, which connects to the cylinder through a 4 in. globe valve. The rapidity with which the pressure reduces in the cylinder when the valve is under test is the reason a larger reservoir space is in contemplation.

Railway Lands Patented.—During May letters patent were issued respecting Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Alberta Central Ry.	4.76
Calgary and Edmonton Ry.	815.36
Canadian Northern Ry.	1,292.82
Canadian Pacific Ry.	19.48
Canadian Pacific Ry., roadbed and station grounds	11.19
Manitoba Ry.	6.38
Manitoba and Northwestern Ry.	2.83
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	1,275.64
Total	3,428.46

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

APPLIED METHODS OF SCIENTIFIC Management. By F. A. Parkhurst, M. E., Organizing Engineer, Assoc. A.S. M.E. 325 pgs., 8vo., 48 figures and 9 plates, cloth. John Wiley & Sons, New York. $2 net.

This book gives the actual detailed application of the methods of scientific management to a manufacturing plant, illustrating the process of installation and the results obtained by data, forms and statistics taken from actual records. The plant used as an example throughout the book employs normally about 150 men in its manufacturing departments and the methods described in the book have proved a paying investment. Production has been increased 3.4 times under the former possible quantity and the labor cost has been reduced 50%. The book tells how and why this was accomplished.

Safety First on the G.T. Pacific Ry.—Following on the favorable results achieved by the adoption of the safety first movement on the G.T.R., Morley Donaldson, Vice President and General Manager, G.T.P.R., has issued a circular announcing the introduction of the movement on that railway. Geo. Bradshaw, Safety Engineer, G.T.R., has been engaged to install the necessary organization, for which purpose he has headquarters at Winnipeg, as well as at Montreal, reporting to the Vice President and General Manager. He will confer with the officers of the various departments, who will render all assistance needed in working out the details to the best advantage. In order that employes, upon whose cooperation the success of the movement depends, may have an opportunity to understand fully what is required of them, meetings will be held at all important centres, at which the nature and purpose of the movement will be explained, and instruction given by means of illustrated lectures and otherwise, in approved methods of preventing injuries.

Water Treatment on Canadian Pacific Railway Western Lines.

Following is a report made to the Master Boilers Makers' Association, at its annual convention at Philadelphia, Pa., recently, by H. W. Armshaw, Foreman Boiler Maker, Locomotive Shops, C.P.R., Winnipeg:—

During the past 24 years the C.P.R. has experimented on its Western Lines with many different methods of water treatment. The chemicals used were principally lime soda ash and caustic soda, and although all of them mixed with the water in various ways before entering the boiler, only one of them took care of the sludge. This method consisted of agitating and settling chamber tanks, with means for removing sludge before the water entered the boiler. This was very satisfactory at times, and prevented heavy scale formation, providing sufficient caustic soda was used to take care of the majority of the sulphate of lime and magnesia, but when treated sufficiently to do this, the locomotive foamed so badly that we were obliged to resort to round trip washouts. When the quantity of caustic soda was reduced to alleviate foaming, a hard flinty scale developed around the tubes at the back tube sheet end, and rosettes and stockings of scale accumulated around the staybolts, together with a formation of it on the firebox plates. The life of tubes and firebox plates was lengthened over what was obtained with crude water, or with any other class of treatment, although it was not determined whether it was more profitable to renew the tubes and fireboxes at intervals to prevent boiler failures or treat the water as described, and during the past 18 months on the Saskatchewan Division and for about one year on the Manitoba Division, the treating of water by this means has been discontinued and a polarized metallic preparation substituted. The results of the application are, that it is possible to keep the boilers clean with sufficient and proper washing out, to run between general repairs without the removal of any tubes and without failures because of leakage. In no case has it necessitated more frequent washing out than with other methods of treatment. It has in all cases permitted 100% more mileage between washouts and in many cases it is possible to run 200%. So far as we have been able to discover, pitting or corrosion does not follow application of this treatment. It does not aggravate foaming. Its action on the removal of old scale and new formation appears to be more mechanical than chemical in that it does not create a pasty sludge next to the fire plates and tubes, which is common with other treatments and which prevents the water getting into proper contact with the plates, being most difficult to wash off, thus producing overheating of the plates and tubes, which frequently results in boiler failures. By correctly regulating the period between washouts, with a strict observance of the best practices, accompanied by good water pressure, it is possible to do better than we have previously, inasmuch as the reduction in boiler maintenance and washing out expense has been greatly reduced, together with economy in water consumption, rubber hose, boots, etc., and less general wear and tear on the tool equipment for boiler washing and boilermaking. There is also a large saving in coal and lighting up material because of boilers being hot, due to less washing out, and also an increasing earning power of the locomotive because it is available any time without boiler-washing or boilermaker's work. Taking into consideration the many advantages, I feel quite satisfied in saying that it is more profitable from a mechanical standpoint than any other treatment experimented with during my experience. It is very conveniently applied after each washout, being distributed in bars over the crown and tubes, or arranged to suit what the inspection indicates to be the proper place to locate it, according to the condition and design of the boiler. It is too early in our experience to say what percentage of saving is effected in boiler maintenance and boiler repairs because it takes several years to arrive at an intelligent estimate of its use compared with what was formerly obtained. However, my experience with it so far demonstrates that it is a great money saver.

In the discussion which followed, particular stress was laid on the necessity for frequent use of the blow off cock, when soda ash is used. On one railway a blow off cock is placed on either side of the locomotive, to be operated from the cab, and the men are obliged to use them for each mile run, or at least between stations. A number of experiences were given in using different boiler compounds, but in all cases their success hinged to a great extent on the systematic use of blow off. Polarized mercury came in for a greater part of the discussion, and a difference of opinion was shown as to its continued efficiency. In one case, it was stated, that it cleaned the boiler of old scale, and for a time thereafter seemed to work all right, when hard scale formed, and it did not do so well as soda ash. In another case it had supplanted a series of water treating stations which extended over a whole bad water division, saving great expense, and it was claimed to have saved many thousands of dollars, besides doubling and trebling the mileage between washouts.

Regulations for Operation by Railways of Opening Bridges Over Navigable Waters.

The Board of Railway Commissioners passed general order 124 dated April 30, as follows:

1. Every swing or draw bridge over a navigable water shall be marked at night by a white light on each side of the navigable channel, by a white light on each end of the swing protection, and by a lantern surmounting the swing span, showing a red light up and down the channel when the passage is closed, and green when the swing is open.

2. In the case of a bascule bridge of any description, it will suffice that a light showing green up or down a channel when the leaf or leaves are lifted, and red when the bridge is closed, be shown from one side or the other of the opening, or, preferably, carried on the end of the leaf. The white lights above described for a swing bridge also to be maintained.

3. The signal to be given by a steamboat to have a swing opened shall be two long followed by two short blasts of the whistle.

4. Every swing or draw shall, whenever it is desired to have a vessel pass through the bridge, be in charge of some competent person present thereat, whose duty it shall be, upon being notified by whistle or in any other manner, that a vessel desires to pass through the bridge, to open the same as promptly as possible; and no such vessel shall pass through the bridge until the swing or draw is fully open.

5. Where, as in the case of the Canadian Northern Ry. bridge over the Red River, at Winnipeg, and the freight bridge of the same railway over the Assiniboine River, at Winnipeg, traffic is so slight that a bridge is required to be opened not more than once or twice a year, the lights provided for under clause 1 and 2 of this order are required to be lit at night only when a vessel desires to pass through the swing or draw.

6. The Fraser River bridge, covered by order 18626, Feb. 6th, 1913, and any other bridge covered by special order whose terms differ from this order, shall be exempt from the provisions herein.

The Largest Owner of Dining Cars.

The Railway Review stated recently that a purchase of 6 dining cars by the Southern Pacific Co. caused the latter to claim the distinction of owning and operating more dining cars than any other railway in America, and that the company now owned 105 dining cars, 5 more than the nearest rival in America, and 40 more than its nearest rival in the U.S., for the same distinction. As the C.P.R. is probably the largest line outside the U.S. operating its own dining cars, it was inferred that the C.P.R. was the rival line referred to. The Official Railway Equipment Register for June gives the Southern Pacific Co. credit for 85 dining cars, which, with the recent purchase of 6, totals 91. The same record shows the C. P.R. with 100 dining cars and 24 cafe-parlor cars, making a total of 124. Even crediting the Southern Pacific Co. with the figures appearing in the Railway Review, there is still a decided balance in favor of the C.P. R., as the Southern Pacific appears to have no cafe-parlor cars, and only 2 cafe-observation cars.

A Suit Between Railway Contractors.

An action brought by A. B. Cook, of Helena, Mont., for a declaration that G. S. Deeks, T. R. Hinds, G. M. Deeks and the Dominion Construction Company are trustees for the Toronto Construction Co. of a contract with the C.P.R. for the construction of the Campbellford, Lake Ontario and Western Ry., has been dismissed by Mr. Justice Middleton in Toronto. Plaintiff was associated with Deeks and Hinds in the formation of the Toronto Construction Co. in 1906, and shared with them in a great deal of work. Though the capital of the company was only $200,000, in six years the dividends amounted to $1,562,500. Plaintiff's associates became dissatisfied with him, and said he was doing too much independent work. They held 75% of the share value of the Toronto Construction Co., and decided to do without Cook in a new C.P.R. contract. In his judgment the Judge said: "While I could wish that greater candor had been displayed towards Cook, on the whole I think his claim is absolutely devoid of merit. He has no moral claim to share in the earnings of the defendants."

Canadian Collieries (Dunsmuir), Ltd.—A press report from London, Eng., states that the Privy Council judgment in the litigation between the company and Jas. Dunsmuir, relative to the acquirement of the property, decides that the company, in addition to the purchase of the coal mines, also purchased the steamships and other assets, including the current bank account. It is estimated that the judgment involves about $1,500,000. Sir William Mackenzie and Sir Donald Mann, of the Canadian Northern Ry., are chiefly interested in the company.

Car Ferry Service for Lake Ontario.—The Canadian Northern Railway is making arrangements to establish a car ferry service between Wellers Bay, Ont., and Sodus Point, N.Y. It is probable that a car ferry barge will be used, to be towed by a powerful tug.

Recording and Handling Correspondence in Operating Department.

By A. P. Thompson, Chief Clerk, Superintendent's Office, Canadian Pacific Railway, Medicine Hat, Alberta.

[EDITOR'S NOTE.—Some little time ago, with the object of standardizing and, if possible, improving the general office systems on the Alberta Division, C.P.R., it was suggested that a meeting be called of all the chief clerks on the division to discuss the best steps to be taken. At a preliminary meeting in Calgary, it was decided to ask certain of the chief clerks to prepare papers and to hold a general meeting, at which the same could be read and discussed. At the general meeting subsequently held, D'Alton C. Coleman, General Superintendent, gave an address and a number of papers were read, one of which, on recording and handling correspondence, by A. P. Thompson, Superintendent's Chief Clerk, Medicine Hat, Alberta, is given in full, as follows:—]

There are several methods of recording correspondence, but I will only deal with the system used in the superintendent's office at Medicine Hat, and the others will, no doubt, come up in the discussion.

We have in use, inward and outward loose leaf registers and classified card index of important files, with each clerk handling correspondence keeping an indexed memo. book record of any files pertaining to his work that he is liable to require at any time. One series of numbers is used for all records, it being part of the register clerk's duty to keep a supply of file backs on hand numbered on top centre face of the file back (form 123) and the lower right hand corner of reverse side with automatic numbering machine. Anyone requiring numbers for new files takes enough of the numbered file backs for his or her immediate requirements, and starts the file properly, stenographers being advised if a new file is to be started. This prevents duplication of file numbers and uses numbers currently. The numbering of the file back on the reverse side is for quick and accurate check of the original file number against the number on any letter of the correspondence, as numerous errors creep up if the stenographers are not careful, and it saves turning the complete file over, with possible disarrangement, if not securely fastened together.

All correspondence is filed in order in four drawer upright filing cases, with a working filing space in the office of 18,000 files. This covers nearly all the current correspondence, with the exception of some of the old files in connection with water supplies, spur tracks, etc., which are kept upstairs in a special filing case for ready access.

The inward register is the same as in use in other general offices, but we make it a practice to show the writer's file number in our register, which is of considerable assistance in tracing files and giving reference if the file itself is misplaced or lost. This is not supposed to happen, but the right kind of material has not yet been discovered from which to make the absolutely correct office boy or file clerk. All inward letters, with the exception of those in connection with accidents and personal injuries, which are recorded under the card index system, are entered under the name of the department or office from which they emanate, that is, general superintendent, master mechanic, car service, claims department, freight department, passenger department, etc., with letters from outside firms and persons under the letters of the alphabet.

The card index of important files is an ordinary card index, using 4 by 5 cards of three colors, classified by an 80 subdivision set of alphabetical guides.

The white cards, headed with station names, bear numbers of all lease and agreement files in force at that station, such as coal sheds, elevators, private spurs, etc. This color of card is also used for new branches or subdivisions, and bears numbers of any files or matters general to the different branches or subdivisions, which cannot be designated under any particular station. Another color card could be used, but there are so few of them that it is not necessary.

The blue cards, headed with station names, bear numbers of all files with regard to important matters that are individual to the station, such as opening an agency, water service, stock yards, supplying a safe, sewer connections, gas well, new station, yard limits, additional trackage, extra land, etc.

The pink cards, headed with letters of the alphabet and one letter following, such as "C-O," bear numbers and subjects of all general matters and instructions as follows:—

(C-O) Coal for stations and pumphouses-1914.
Coal contracts,
Coal scoop (standard),
Constables (appointment of),
Coal sides on Hart and flat cars.

(M-A) Mange regulations,
Maintenance of way rules,
Mail cranes.

It is important that care be used in entering only such files as are of importance, as an injudicious use of this cabinet for recording numbers of unimportant files will soon make it so bulky and unwieldy that a great deal of the benefit to be accrued from a compact index, easily checked, will be offset by having to wade through an accumulation of unimportant subjects, very probably never required after being entered.

The indexed memo books kept by the accountant, senior clerk, the superintendent's secretary and myself, contain some of the most important file numbers, as entered in card index, for ready reference in dictating without the file and getting files from the cabinet without having to disturb the register clerk. They include as well the file numbers of correspondence of less importance that may be in use during any month, then never referred to again, such as payroll expenses, delays to earnings, thefts, delayed cars, loading and unloading coal, running of snow plow, cars under repairs and others of like nature.

Another record of files that often saves hours of time looking through the register, is to have file numbers of any correspondence regarding an employe's staff or discipline record entered on staff card.

One minute taken at the time to enter a record will save hours of time endeavoring to locate the file from the register some months in the future.

The inward mail is opened by the office boy first thing in the morning, with the assistance of any member of the staff who has not got work to start on at 8.30 k. The values are placed on the senior clerk's desk and opened by him. These include the general superintendent's mail, which is given to the register clerk at once, who registers it in while the other mail is being opened and dated, thus getting the important mail early. Mail, as registered, is, in most cases, sorted by myself and distributed to the different clerks and officers.

There are eight file baskets on a table behind my desk in which the mail for the following officers is placed:—Trainmasters, District Master Mechanic, Resident Engineer, Bridge and Building Master, Telegraph Inspector, Roadmasters, Gas Inspector.

The chief dispatcher, being in all the time, any mail for him is delivered. Only mail that requires personal attention of the officers is placed in the baskets, and as they come in off the line they go through it, dictate replies to stenographers, put on notes as to what they wish done, or in other cases advise the senior clerk or myself the way they wish it handled.

The greater part of the routine correspondence for the district master mechanic, trainmasters and other subordinate officers is handled by the senior clerk, pink copies being made of all such letters, which, after noting, I put in the basket for the personal information of the officer whose name is signed to the letter; after noting he destroys it. All other mail dictated by senior clerk, the accountant and others, after being proof read by the dictator, is placed on my desk for signature. Senior clerk proof reads all the mail written by my stenographer, as well as his own. I have found the signing of the accountant's mail to be a good preventive against a number of errors that might have crept into the files due to the accountant not being aware of all circumstances and conditions that come under my notice. Mail dictated by the superintendent when in the office is signed, then placed on my desk and I read it over before it is sent out. Carbons of mail written on the line are noted by me before being filed.

There is a great deal of correspondence that a chief clerk could handle on his own initiative which should be drawn to the attention of the superintendent, and I have found it better to go over the file, decide how I would handle it, then, instead of dictating the letter, take the file, or files, in to the private office and discuss them with the superintendent before dictating, as sometimes if a letter is already written and taken in for signature it will be signed, although it does not quite carry the meaning the officer would desire. If I sign any letters of instructions or send any wires on files the superintendent is interested in, the file is placed among his correspondence for noting.

We have adopted the system of filing abeyance as in use in the general superintendent's office, and have found it a marked success. The system is this, that no files, except telegrams, are kept separate waiting on replies, all being filed in the cabinets. As an example: A letter is written which requires a reply, the carbon on the file is marked, "Trace," with a date allowing sufficient time for the person addressed to reply. The number of each file so marked is entered up on a page in the tracing book under the date corresponding with that following the word "trace," and as each reply comes in the register clerk cancels the number in the tracing book, each day getting all files which show up under that date as not having been replied to, sends out a tracer and advances the tracing date two or three days. If reply is not received after the first tracer, file is given to the senior clerk or myself for special attention. Any file that you wish to take up at some later date can be marked "Hand me," with the date and initials following, the number being entered in the tracing book under the proper date. The tracing for replies to letters to superior officers is handled by senior clerk or myself.

The third copies of all letters, or the yellow copies as we call them, are sorted each day under the headings as used in the letter register, and filed temporarily in a loose leaf binder, the same as the standard tariff binder, and as the binder fills, about 500 letters are taken out and bound in the letter book backs supplied by the stationery department. Each page is numbered con-

secutively with the automatic numbering machine. We endeavor to keep the outward letters registered up to within three days of the current date, but this fluctuates according to the amount of work being handled.

There are a few little things that help in the handling of correspondence, and I will head them under the "don'ts."

Don't forget to quote correctly date and file number of any letters replied to.

Don't scatter subject all through the letter. Put it in the first paragraph. Better still, segregate it.

Don't include two subjects in one letter.

Don't overlook enclosing enclosures.

Don't use two pages when one will do. Save time and stationery.

Don't forget to acknowledge receipt immediately of all letters from private persons and outside firms.

The discussion on the above paper was led by W. L. Stone, of Calgary, and the following recommendations were adopted:—

The system of tracing correspondence outlined in Mr. Thompson's paper.

That the subjects of letters should be dictated to stenographers and written by them at the top of the letter.

That a list of all unanswered letters be supplied the superintendents by the general superintendent's office twice a month.

That the system of keeping track of files within the office now used in the general superintendent's office is a good one for unit offices and may be adapted to other offices. This system simply consists of entering on a sheet daily (form P.R. 1 is used) the file number of every file handed to any one in the office, and the initial of the person to whom handed. These file numbers are indexed according to the last figure in each. File 156421 handed J. Smith would be shown:

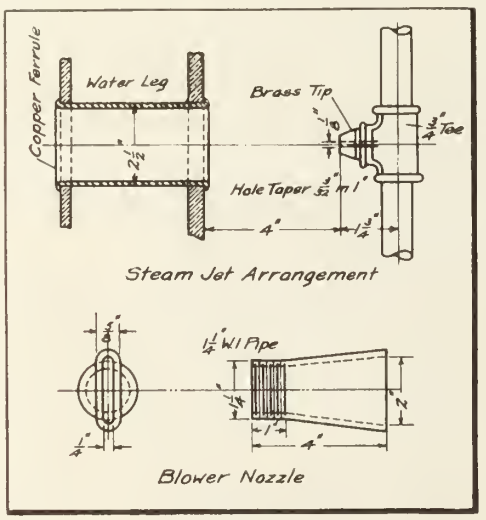
	1	3	5	7	9
JS	15642				
	0	2	4	6	8

Smoke Consumers on Grand Trunk Railway Locomotives.

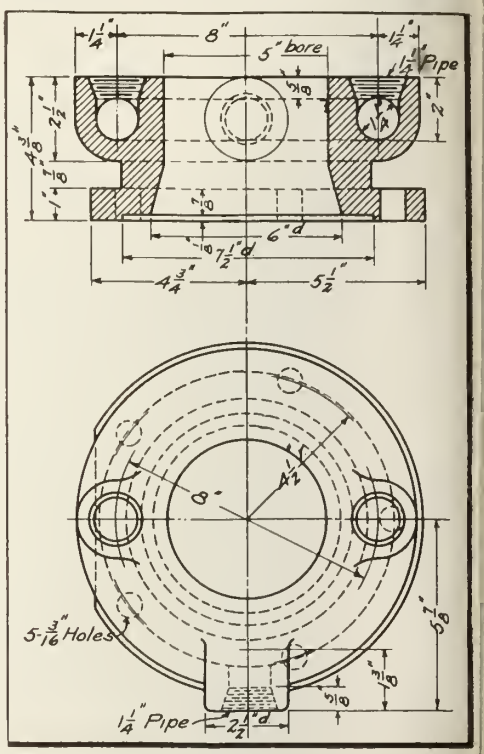
A brief description of the efforts being made by the G.T.R. to reduce the amount of smoke given off from locomotives appeared in Canadian Railway and Marine World for Oct., 1913. For some considerable time the G.T.R. has been experimenting, largely occasioned by the recent smoke ordinances in Chicago. The experiments proved such a success that a number of the yard locomotives at Windsor, Ont., were equipped with the device developed, which is illustrated herewith. Yard locomotives at other terminal points on the system are also being similarly equipped, but the installations have not been applied to road locomotives, as the same objectionable feature is not so apparent there, the principal objections to smoke arising in the larger communities, yard locomotives, especially if fired while standing, emitting great volumes of smoke.

The installation, as applied to a class F locomotive, is shown herewith. Along the side of the firebox, from 16 to 18 ins. above the fire, there are placed eight 2 in. tube ferrules through the water leg, four on each side, the openings on opposite sides being slightly staggered, as shown. Back from each opening about 4 ins., and concentric with it, there is a small jet, connected to a ¾ in. steam pipe, this latter braced from the side of the firebox. The jet consists of a small brass tip inserted in a ¾ in. T, the tip having a ⅛ in. hole, from which the steam blows into the water leg ferrule. The hole in the tip is slightly divergent at the outer end, so that the steam jet as it enters the ferrule completely fills the latter, creating a strong suction from the surrounding air, a considerable volume of air being thereby carried into the firebox, over the top of the fire. The brick arch in the front of the firebox is built lower than usual, in order that the injected air may mix thoroughly with the smoke as it is given off from the bed of coals, and while it is hottest. The incandescent particles of carbon, in the form of smoke, meeting this extra supply of air, continue the uncompleted combustion that commenced in the bed of coal, and pass on through the flues as completed products of combustion. In a demonstration witnessed by the writer, dense black smoke was almost instantly reduced to an almost imperceptible vapor. In the test witnessed, a yard locomotive that had been standing on a siding for some time, with a normal fire, had several shovels of coal introduced, with the usual result of dense black smoke being given off from the stack. On turning on the steam through the side steam jets, the smoke almost immediately disappeared.

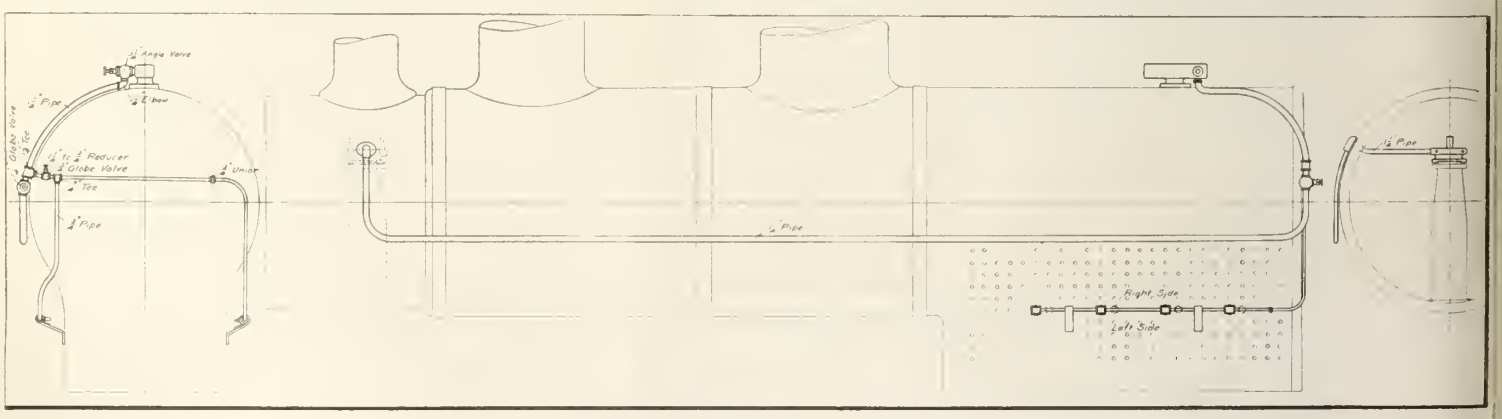
The G.T.R. is also experimenting with a circular blower in the stack, for creating draught when firing up, standing or drifting. This device, as applied to a locomotive of the same class, is shown herewith. It consists of a circular ring casting, encircling and secured to the exhaust tip, with two vertical blower nozzles in the upper face of the ring. The tips consist of 4 in. lengths of



Steam Jet Arrangement and Blower Nozzle.



Double Nozzle Blower Ring.



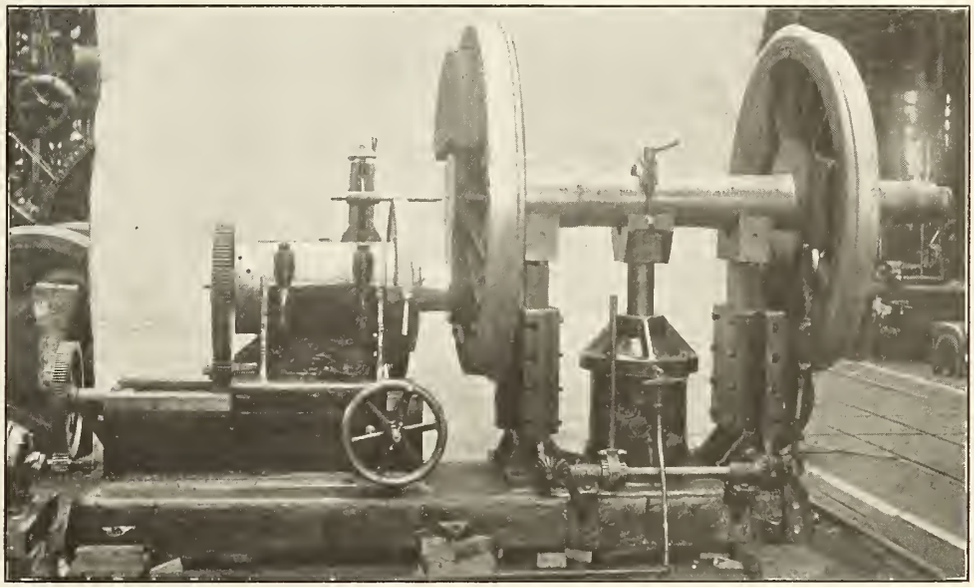
Installation of Smoke Consumer and Blower on a G.T.R. Class F Locomotive.

1¼ in. pipe, flattened on one end, and threaded into the blower ring. These flattened tips are bent slightly inwards, so that tbeir blasts, impinging on each other nearly midway in the stack, form a strong draught cone. Tbis new type, which is giving uniform success, replaces the bent pipe construction in former use, the draught from which, created as it was by a single nozzle, was not satisfactory.

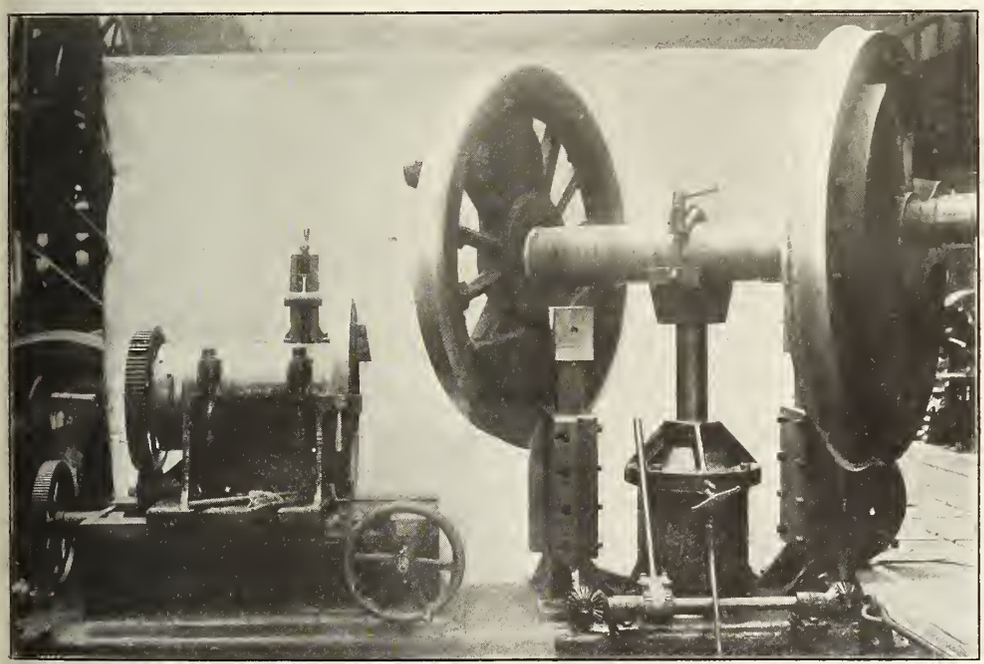
Crank Pin Turning Machine in Canadian Pacific Railway Shops.

Tbe C.P R. has in use in three of its shops a crank pin turning machine designed and built in its Angus shops, Montreal, and which is illustrated herewith. The first machine was placed in service at Angus sbops about three years ago. This proved sucb a success, and was deemed to be such an improvement over existing practice that another one was built there for the West Toronto shops. The initial installation had been in service long enough to develop any weaknesses, so that the second machine had several important changes from the initial design, and it is this second design tbat is shown in the accompanying illustrations. Tbe third installation in the Ogden sbops is similar to this latter development, the Ogden machine being built just sbortly after the one for West Toronto.

Tbe machine consists essentially of a pair of vertically adjustable supports for the pair of wheels, with a horizontally adjustable head for the cutting tool, the whole supported on a cast iron bed plate extending the full length of the machine. The vertically adjustable supports are carried in castings bolted to the bed plate, and consist of square rods, having V block tops, guided in the main support castings, and moved vertically by worms, which connect through bevel gears to a shaft along the front of the bed plate, a ratchet arrangement forming the means of vertical adjustment of the V block supports. This shaft along the front is divided into two sections axle to secure the latter in place. The air cylinder is used for turning the wheels end for end, when changing positions so as to machine the pins on the opposite sides. The cylinder lifts the wheels clear of the supports, when they can be swung around into



Crank Pin Turning Machine set up for Machining a Crank Pin.



Crank Pin Turning Machine having Wheels Shifted for Operating on the Opposite End.

inside the ratchet block, so that each support may be adjusted independently, or, as is usual, adjusted in unison by engaging the two ratchet dogs together. The outward faces of the support castings each have a vertical rib, against which the inner face of the flange bears, held in place by bolts in any of tbe four horizontal T bolt slots in tbe support casting face.

Midway between the supports there is a vertical air cylinder, the top of the plunger rod in which carries a V block head, with an encircling clamp over the top of the the new position.

The quartering machine head resembles very closely the head of a lathe, the principal difference being in the fact that the quartering machine head is adjustable along horizontal ways, like a lathe carriage. The spindle in the head is in the form of a hollow sleeve, with a flange carrying the tool on the forward end, and a driving gear on the rear end. The sleeve is driven from a motor, through a pinion and gear operating a shaft in the bed of the machine, and thence through a train of gears to the gear on the rear end of the sleeve. The tool is carried on a small carriage, which is adjustable radially through a screw, on the outer end of which there is a star wheel. On the front of the machine, above the handwheel for adjusting the head, there is an arm, projecting forward from the head casting, parallel with the face of the flange, with the vertical handle suspended from it as shown. In the head of this projecting arm there is a small block, free to move parallel to the centre line of the sleeve, and controlled by an eccentric on the handle. The inner face of the sliding block has a knife edge, radial to the sleeve, which, by a manipulation of the handle in front, may be brought into such a position as to just touch the outer end of the feeding star teeth as the head revolves, or else into fuller engagement by sliding the block farther along. Any desired inward feed may be obtained in this manner while the machine is in motion.

On the back of the carriage there is a small carriage on vertical ways, this carriage carrying a horizontal rod, which may be slipped out towards the wheels, for centring the latter. The side of the vertical ways carries a scale, marked off to register the throw of the crank pin, so that by first adjusting the scale carriage to the correct throw, the wheels are raised in their supports to their proper position, with the indicating bar in line with the wheel centre.

After setting up for the correct throw, and levelling the wheels, the pin on one end is centred in the sleeve of the head for dressing down. For pulling around while adjusting, the turnbuckle arrangement attached to the right wheel is used, close adjustment being thereby secured. After correct setting of the wheels the feed of the head is thrown in, and the pin on the one end finished. The wheels are then raised by means of the air cylinder, and swung around, end for end. The wheels are turned around through a quarter turn, and lined up accurately for the exact 90 degrees, by means of quartering level. This latter consists of a long arm, in which a level is set. The foot of the arm is a square, which fits up against the finished crank pin. Levelling the arm with regard to the axle centre, finally adjusts the wheels into position for machining the crank pin on the other end. Very quick work is possible with a machine of this type. It can be utilized in small shops as a quartering machine, as provision has been made by which a boring bar can be inserted in the hollow sleeve or headstock spindle.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

General order 124. Apr. 30.—Approving regulations to govern operation by railway companies within legislative authority of Parliament of Canada, of draw, or swing, or bascule bridges over navigable waters.

General order 125, May 30.—Ordering that terms of judgment in Western Rate Case, which is hereby made part of this order, and tariff changes therein directed to be made, be complied with and become effective not later than Sept. 1; and that, for two years from date, no rates at present in effect west of Port Arthur, Ont., be increased without Board's approval.

General order 126, May 28.—Declaring that report or reports submitted by railway companies in accordance with Circular 133, are privileged, and shall only be made public or given out upon application therefor by order of the Board.

21810. May 16.—Amending order 20002, Aug. 11, 1913, re Winnipeg, Selkirk and Lake Winnipeg Ry. subway at Middlechurch, Man.

21811. May 11.—Ordering that classification of maple cheese be made same as fixed by order 21745, May 2, for maple butter; addition to be included in Supplement 3 to Canadian Freight Classification 16.

21812. May 16.—Authorizing Canadian Northern Ry. to rebuild bridge over Sturgeon River, station 403, mileage 8.1, St. Albert Settlement, Alta.

21813. May 14.—Authorizing C.N. Ontario Ry. to build bridge over Indian River, Richards Tp., mileage 107.85 from Ottawa; and rescinding order 20888, Nov. 21, 1913.

21814. May 16.—Authorizing C.P.R. to open for traffic its Snowflake West Branch, Man., mileage 0 to 10.

21815. May 13.—Ordering C.P.R. within 60 days to install automatic bell at crossing of Laviolette Ave., Three Rivers, Que., 20% be paid out of railway grade crossing fund.

21816. May 14.—Authorizing C.P.R. to build spurs from main line, mileage 2.26, Muskoka Subdivision, in Lot 1, Con. 4, west of Yonge St., York Tp., Ont., on land owned by Canadian Kodak Co.

21817. May 14.—Authorizing G.T.R. to build siding for Brantford Industrial Realty Co., south of Alice St., Brantford, Ont.

21818. May 16.—Approving clearances as shown on C.P.R. plan of overhead pipe line crossing of Standard Paint Co. sidings, Lachine Parish, Que.

21819. May 11.—Authorizing Hamilton Radial Electric Ry. to build spur to and through lands of Sir Henry Pellatt and Dominion Power & Transmission Co., Saltfleet and Barton Tps., Ont.

21820. May 11.—Authorizing C.P.R. to build extension to trackage for Gordon, Ironside & Fares Co., Winnipeg, Man.

21821. May 11.—Ordering C.P.R. to build roadway 66 ft. wide, from north and south road allowance northwesterly to point of dam, and thence northwesterly joining east and west road allowance in centre of Sec. 17 and 8, Trossachs, Sask., and reserving apportionment of cost.

21822. May 18.—Approving revised location of G.T. Pacific Ry., mileage 220.60 to 230.30, Yellowhead Pass West, Cariboo District, B.C.

21823. May 18.—Authorizing G.T. Pacific Ry. to operate over crossing of Canadian Northern Ry. at Empire Ave., Fort William, without first stopping trains.

21824. May 18.—Authorizing G.T.R. to rebuild bridge carrying farm crossing over tracks in Lot 33, Con. 1, South Dumfries Tp., Ont.

21825. May 14.—Amending order 138, June 17, 1904, re crossing of G.T.R. by Sarnia St. Ry.

21826. May 18.—Authorizing C.P.R. to use bridge 144.6, Portal Subdivision, Sask.

21827. May 18.—Extending to June 30, time for C.P.R. to complete siding for M'Cormick Mfg. Co., London, Ont., authorized by order 20710, Nov. 4, 1913.

21828. May 11.—Rescinding order 21518, Mar. 18, which directed the C.P.R. to restore old clearance at bridge over north branch of Clyde River, just north of Flower station, Ont., by raising under side of top of culvert 11 ins.

21829. May 18.—Extending to Nov. 1, time for completion of subway under C.P.R., in Regina, authorized by order 12801, Jan. 20, 1911.

21830. May 19.—Authorizing Saskatchewan Government to build highway crossing over C.P.R., in s. w. ¼ Sec. 21, Tp. 19, R. 18, w. 3. m.

21831. May 16.—Authorizing Cedar Rapids Mfg. and Power Co. to take certain lands in St. Ignace du Coteau du Lac Parish, Que.

21832. May 18.—Authorizing Town of Mont Laurier, Que., to build highway crossing over C.P.R. at mileage 134.45, Laurentian Subdivision, Campbell Tp., Que.

21833. May 19.—Authorizing Canadian Northern Ry. to cross public road between Secs. 14 and 15, Tp. 51, R. 12, w. 4. m.

21834. May 18.—Authorizing C.N. Quebec Ry. to build spur to Dansereau's Mill, and to cross Bay St., Grenville, Que.

21835. May 18.—Authorizing G.T.R. to build spur from Ferguson Ave., Hamilton, Ont., to its property west of Ferguson Ave.

21836. May 18.—Ordering G.T.R. to change grade of approaches to Bergevin's Crossing, between Danby and South Durham, Ont.

21837. May 18.—Authorizing G.T. Pacific Branch Lines Co. to build a bridge across South Saskatchewan River at mileage 86.5, on its Young-Prince Albert Branch. Sask.

21838. May 18.—Ordering C.P.R. within 60 days to install electric bell at crossing in Maple Ridge municipality, Port Hammond, B.C.

21839. May 16.—Approving change in location of C.P.R. station at Kreuzburg, Man.

21840, 21841. May 18.—Approving C.P.R. plans showing proposed subway at Anthony St., Strathcona, Edmonton, and clearances at its coaling plant at Aldersyde, Alta.

21842. May 19.—Authorizing C.N. Ontario Ry. to build crossing of concession road between Lot 10, Con. 5, and Lot 10, Con. 6, Nepean Tp., and rescinding order 17859, Nov. 6, 1912, in so far as it approved road division there, and rescinding order 20110, Aug. 18, 1913.

21843. May 20.—Authorizing rural municipality 342, Sask., to build highway crossing over G.T. Pacific Ry., Prince Albert Branch in n. w. ¼ Sec. 28-34-27, w. 2. m., Sask.

21844. May 20.—Authorizing C.P.R. to build spurs for White Falls Lumber Co., Ltd., Sudbury, Ont., at Blind River, Ont.

21845. May 20.—Authorizing G.T.R. to build siding for Aitken & Sons, Beeton, Ont.

21846. May 19.—Authorizing C.P.R. to build temporary sidings for Dominion Bridge Co., Montreal, for one year from date.

21847. May 19.—Ordering Campbellford Lake Ontario and Western Ry. (C.P.R.), to lay 12 in. pipe under its embankment, in west ½ Lot 30, Con. 2, Pickering Tp., Ont.; F. Roach, Cherrywood, Ont, to have right to lay water pipe through said 12 in. pipe for conveying water to pasture.

21848. May 18.—Dismissing Bell Telephone Co.'s application for leave to erect telephone wires on Concord St., Grey and Harvard Aves., Montreal; and authorizing it to erect overhead line on east side of Mountain St., pending construction of permanent pavement there, when wires shall be placed underground.

21849. May 20.—Amending order 21734, May 2, re Great North Western Telegraph Co.'s poles and wires on certain streets in Lindsay, Ont.

21850. May 18.—Ordering Canadian Northern Ry. to build a dam on creek diversion near north boundary of Sec. 16-31-15, w. 4. m., Alta., the crest to be 6 in. higher than top of pipe under railway embankment; work to be completed within one month, and rescinding order 21139, Dec. 31, 1913.

21851. May 22.—Authorizing C.P.R. to open for traffic its second main line track from Iberville station, to St. Johns, Que., mileage 19.2, to 20.02.

21852. May 16.—Approving location of G.T.R. station at Penetanguishene, Ont.

21853. May 22.—Amending order 10457, Apr. 28, 1910, re G.T.R. overhead bridge at Lachine Road, Rockfield, Que.

21854, 21855. May 22.—Approving location of Edmonton, Dunvegan and British Columbia Ry., through Tps. 77-78, R. 19-23, and Tps. 74-77, R. 18-19, w. 5. m., Alta.

21856. May 22.—Extending express collecting and delivery limits in Outremont, Que.

21857. May 23.—Dismissing application of Cleveland, Tp., Que., for order apportioning cost of work on highway crossings by G.T.R. about 3 miles east of Richmond station, by closing crossings and diverting road to northeast and along G.T.R. right of way.

21858. May 22.—Ordering G.T. Pacific Branch Lines Co. to divert crossing across its tracks at mileage 13.6, Caron, Sask., and to open north and south as well as east and west road allowances, mileage 8.5; work to be done 60 days from date.

21859. May 23.—Dismissing application of Federal Electric & Mfg. Co., Montreal, for order extending express collection and delivery limits there.

21860. May 19.—Dismissing complaint of Superior Sand & Gravel Co., St. Gabriel de Brandon, Que., against rate charged by C.P.R. on sand and gravel to Montreal.

21861. May 22.—Dismissing application of J. H. McPherson, Beverley Tp., Ont., for order directing C.P.R. to build siding to his premises.

21862. May 23.—Ordering Canadian Northern Ry. to rebuild fence between Drumheller and Calgary, Alta., within 2 months from date, work to be done to satisfaction of Board's Engineer.

21863. May 23.—Authorizing Village of Beauport, Que., to build 2 highways over Quebec Ry. Light, Heat & Power Co.'s railway.

21864. May 23.—Authorizing C.P.R. to build double track, Farnham Subdivision, at grade across Champlain St., St. Johns, Que., mileage 19.9; to put back sidewalk as it was before construction, to reinstate original grade; and rescinding order 21714, Apr. 29, authorizing temporary crossing.

21865. May 20.—Ordering C.P.R., within 60 days, to install improved type of automatic electric bell at crossing of Albert St., Alliston, Ont., 20% to be paid out of the railway grade crossing fund, all train movements on sidings be flagged over crossing by C.P.R. trainmen.

21866. May 20.—Ordering C.P.R. to install gates at St. Maurice, St. Thomas and Bonaventure Sts., Three Rivers, Que., 20% to be paid out of the railway grade crossing fund, ¼ of cost of operating to be paid by City of Three Rivers.

21867. May 20.—Amending order 21691, Apr. 25, re land for Campbellford Lake Ontario and Western Ry. (C.P.R.) approaches to freight yards, etc., at Bowmanville, Ont.

21868. May 23.—Dismissing W. Watters' application for order directing G.T.R. to take his property on Ferguson Avenue, Hamilton, Ont.

21869. May 19.—Rescinding order 14964, Sept. 19, 1911, re lumber rates from Routhier, Que., to Montreal, for export.

21870. May 26.—Suspending Duluth, South Shore and Atlantic Ry. tariff C.R.C. .331, pending hearing at Ottawa, June 16., when D. S. S. & A. Ry. and C.P.R. will be required to show cause why same should not be disallowed.

21871. May 23.—Authorizing G.T.R. to rebuild bridges 239, milepost 209.45, near Powassan, and 247, milepost 222.12, near Nipissing Jct., Ont.

21872. May 23.—Authorizing Canadian Northern Ry. to build spur from Block 82, old plan 33, and described as subsidiary spur 4, with extension across 6th Ave., down Block 141, and across Cornwall St. and 5th and 6th Aves., Regina, Sask.

21873. May 26.—Authorizing Lake Erie and Northern Ry. to build at grade across G.T.R. at station 1281+58, Simcoe, Ont., interlocking plant to be installed by L. E. & N. R.

21874. May 23.—Approving clearances of awning on Toronto Dairy Co.'s premises, Woodstock, Ont.

21875. May 23.—Authorizing C.P.R. to use bridge 144.8, Portal Subdivision, Sask.

21876. May 26.—Approving C.P.R. detail plans showing overhead crossing at Eighth Ave. West, Moose Jaw, Sask

21877. May 26.—Ordering Canadian Northern Ex. Co. to file joint tariffs showing express rates on fruits and vegetables from shipping point in Prince Edward County to points beyond or via Smiths Falls, reached jointly by it and Canadian or Dominion Ex. Cos., that shall not exceed rates on said commodities published by Canadian and Dominion Ex. Cos. from Niagara District, to same points.

21878. May 28.—Ordering C.P.R. to provide cabin close to crossing at Cherry St., Toronto, on south side of railway and west side of street, properly heated, and with windows giving clear view up and down railway for more than a block in each direction, for use of flagman to protect public using crossing between hours of 6.30 a.m. and 7.00 p.m.

21879. May 26.—Relieving C.P.R. from providing further protection at crossing of highway second east of Green Valley, Ont.

21880. May 26.—Authorizing C.P.R. to build road diversion in Sec. 14, Tp. 11, R. 10, w. 3. m., Sask., and to build its Swift Current South Easterly Branch across same at grade.

21881. May 26.—Authorizing Montreal and Southern Counties Ry. to build across 4 highways in St. Cesaire, Que.

21882. May 26.—Authorizing G.T.R. to operate jointly with C.P.R. over sidings for E. W. Gillett Co., south of Liberty St., over C.P.R. on north side of Liberty St. and between Liberty St. at which joint tracks end, and diamond crossing on Jefferson Ave., Toronto.

21883. May 26.—Authorizing G.T.R. to build siding for Dominion Foods, Ltd., St. Catharines, Ont.

21884. May 26.—Authorizing South Vancouver District, B.C., to build Main St., over Vancouver and Lulu Island Ry.

21885. May 27.—Approving location of Canadian Northern Ry. station at Mervin, Sask.

21886. May 27.—Approving location of C.N. Ontario Ry. station grounds at Clemow, mileage 133.26 from Ottawa.

16, and ordering C.N. Quebec Ry. to fence

21887. May 20.—Rescinding order 21217, Jan.

portion of its right of way between mileage 26 and 27, on south side of track, by June 1.

21888. May 26.—Authorizing Toronto Eastern Ry. temporarily, pending installation of interlocking plant, to operate over crossing of G.T. R. Port Perry Branch at Whitby, Ont., for construction purposes only; interlocking plant to be installed by July 20, all movements of applicant's trains to be flagged over crossing by its employes.

21889. May 27.—Dismissing complaint of Mrs. K. S. Massiah, Lachute, Que., alleging discrimination by C.P.R. against Lachute in issuing commutation tickets to St. Agathe, Vaudreuil, Hudson, and other points.

21890. May 27.—Authorizing C.P.R. to divert road s. w. ¼ Sec. 3-8-29, w. 2 m., Sask., and build its Weyburn-Stirling Branch at grade across same between s. w. ¼ Sec. 3 and s. e. ¼ Sec. 4-8-29, w. 2. m., mileage 105.23.

21891. May 27.—Authorizing C.P.R. to build siding for I. L. Lafleur, Notre Dame de Grace, from mileage 2.54, Windsor Street, to Montreal Jct., Que.

21892. May 27.—Authorizing Canadian Northern Ry. to build across and divert highway between Secs. 15 and 16-11-22, at Truax, Sask.

21893. May 26.—Authorizing C.N. Ontario Ry. to build, by a separation of grades, across G. T.R. and C.P.R. in Toronto.

21894. May 27.—Amending order 21508, Mar. 14, to allow G.T. Pacific Ry. to make certain changes in highway crossings in Tp. 34, R. 1 and 2, w. 3. m., Sask.; and extending for 30 days from May 31, time within which such work shall be completed.

21895. May 27.—Authorizing G.T. Pacific Ry. to build spur for Inland Lumber & Building Co., Edmonton, Alta.

21896. May 26.—Authorizing G.T. Pacific Ry. to build highway crossing at mileage 44.9, Sunset Ave., Whitewood Sands, Alta.

21897, 21898. May 27.—Authorizing G.T.R. to build siding and spurs therefrom, for Elias Rogers Co., and siding for United Drug Co., Toronto.

21899. May 26.—Authorizing G.T.R. to use branch line authorized to be built by Toronto, Hamilton and Buffalo Ry. to National Steel Car Co., Hamilton, Ont., under order 17562.

21900. May 27.—Ordering Dominion Atlantic Ry. to employ flagman to protect crossing of highway west of Port Williams station, N.S., when trains are passing without stopping.

21901. May 28.—Amending order 21243, Jan. 21, re prohibition of whistling by locomotives in Winnipeg, by decreasing the penalty from $50 to $10.

21902, 21903. May 29.—Approving agreement between Bell and Byron Telephone Cos. of May 14, and between Bell and Alnwick Rural Telephone Cos., of May 15.

21904. May 29.—Ordering C.P.R. to build subway under tracks crossing highway between Lots 5 and 6, Con. 5, Toronto Tp., Ont., subway to be built in line with highway so there will be clear view through it from highway at each end; headway 14 ft.; clear span of 20 ft. over crown of highway; 20% of cost, not exceeding $5,000, to be paid out of railway grade crossing fund, 5% remainder by Streetsville, 15% by Toronto Tp., and balance by C.P.R.

21905. May 28.—Dismissing application of Town of Aylmer, Que., for reduction in fare between Ottawa and Aylmer on Hull Electric Ry.

21906. May 29.—Dismissing application of St. Marys Horse Shoe Quarry, St. Marys, Ont., to relieve it from maintenance and interest charged upon G.T.R. spur to its property.

21907. May 28.—Ordering Lake Erie and Northern Ry. to build level crossing on B. Bowlby's farm in Lot 5, Con. 2, Woodhouse Tp., Ont.

21908. June 1.—Amending order 21837, May 18, re G.T. Pacific Branch Lines Co.'s bridge across South Saskatchewan River at mileage 86.5, Young-Prince Albert Branch, Sask.

21909. June 1.—Extending to Aug. 15, time within which G.T.R. shall complete lighting of Victoria Bridge, Montreal.

21910. June 1.—Relieving G.T.R. from further protecting crossing of highway immediately west of Lorne Park station, Ont.

21911. June 1.—Amending order 21725, Apr. 29, re Campbellford, Lake Ontario and Western Ry. (C.P.R.) crossing of road allowance, mileage 88.62, Murray Tp., Ont.

21912. May 27.—Authorizing C.P.R. to divert Graham Ave., Stonewall, Man.; authorizing it to build at grade across Lilly St.

21913. May 29.—Ordering C.P.R. to install gates at crossing of Hurontario St., Toronto Tp., to be operated by day and night watchmen; and file detail plans for approval of Board within 30 days from date; 20% to be paid out of the railway grade crossing fund; 20% of maintenance, including wages, to be paid by Peel County; gates to be in operation by July 1.

21914. June 1.—Ordering that crossing of C.P.R. by St. John Ry., on Main St., be protected by half interlocking plant; derails to be placed on St. John Ry. and home signals on C.P.R.; derails to be interlocked with signals; normal position of signals at proceed for C.P.R. and stop for St. John Ry., C.P.R. to have priority; St. John Ry. to pay cost of installing, maintaining and operating half interlocking plant.

21915. June 11.—Authorizing C.P.R. to open for traffic its second main line track between Agincourt, mileage 87.3, and Leaside Jct., mileage 95.6, Toronto subdivision.

21916. June 1.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to carry traffic over its line from Glen Tay to Agincourt, mileage 0 to 182.6, Ont.

21917. June 1.—Approving Montreal and Southern Counties Ry. location from westerly boundary of Granby, easterly along Main, Drummond, Irwin and St. Charles St.

21918. June 1.—Authorizing Nelson and Fort Sheppard Ry. (G.N.R.) to build spur for Benton Pole and Timber Co., West Kootenay Division, B.C.

21919, 21920. June 1.—Approving Montreal and Southern Counties Ry. location from boundary between St. Cesaire and St. Paul d'Abbotsford parishes to west boundary of Granby, mileage 35.05 to 45.61, and authorizing it to build across public highways between Lots 178 and 179, and between Lots 217 and 48-47, St. Paul d'Abbotsford Parish, Que.

21921. May 22.—Ordering Dominion Atlantic Ry. to fill in approaches to crossing of Grafton Road, Grafton, N.S., 300 ft. to south and 400 ft. to north.

21922. June 6.—Ordering C.P.R. to re-establish and maintain train service between Winnipeg and Gimli, that existed prior to June 1, until sittings of Board at Winnipeg, on June 26, when those interested shall be heard.

21923. May 29.—Ordering G.T.R. to build extension of interchange track with Hamilton Radial Electric Ry. near Burlington, Ont., to accommodate at least 10 cars; work to be completed within 60 days; cost to be borne equally by the two companies.

21924. May 28.—Dismissing application Board of Trade, Sheho, Sask., for order directing C.P.R. to remove station to town side of track.

21925. May 26.—Dismissing application of town of Gladstone, Man., for order directing Canadian Northern Ry. and C.P.R. to build highway over their lines at Dufferin St.

21926. May 26.—Dismissing application of residents of Lac du Bonnet, Man., for order requiring C.P.R. to build platform opposite the village, and requiring local train to stop there night and morning.

21927. June 2.—Certifying correction of Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan to show division line between certain lands as shown on plan dated May 15.

21928. June 4.—Authorizing C.P.R. to build its Lake Louise Branch at grade across highways between mileage 0 and 3.55.

21929. June 4.—Authorizing C.P.R. to use bridge 30.5, Timiskaming Subdivision, Lake Superior Division, Ont.

21930. June 4.—Amending order 21706, Apr. 21, re C.P.R. clearances at West Toronto, Ont.

21931. May 29.—Ordering C.P.R. to build subway at crossing of Hurontario St., Toronto Tp., Ont., to be 20 ft. wide and 14 ft. clearance; work to be completed by Sept. 1, 20% of cost to be paid out of railway grade crossing fund, 15% of remainder by Toronto Tp., and balance by C.P.R.

21932. June 1.—Authorizing Bay of Quinte Ry. to open for traffic diversion of its line in Lots 32, 33 and 34, Con. 8, Camden Tp., Ont.

21933. June 4.—Authorizing Vancouver, Victoria and Eastern Ry. and Navigation Co. (G.N.R.) to rebuild bridges across C.P.R. at Grand Forks, B.C., subject to condition that should any additional tracks be built by C.P.R. at that point V.V. and E.R. and N. Co. shall pay for necessary changes for same.

21934. June 2.—Authorizing G.T.R. to build siding for Siemon Bros., Wiarton, Ont.

21935. May 26.—Dismissing application F. Yestran, Rosewood, Man., for order requiring Canadian Northern Ry. to stop its "flyer" train at Dufresne, Man.

21936. June 5.—Amending order 21913, May 29, re C.P.R. crossing gates at Hurontario St., Toronto Tp., Ont.

21937. May 29.—Ordering G.T. Pacific Ry. within 30 days to file plans of standard 1A station with 60 ft. platform between Tofield and Deville, stock pen with platform and loading chute, also spur for at least 4 freight cars; all to be completed by Sept. 1; also that way freight and passenger trains, other than through passenger trains, stop at said station.

21938. May 29.—Authorizing City of Edmonton, Alta., to open Spruce Ave. across Canadian Northern Ry., and to build its municipal railway across C.N.R. at grade on Spruce Ave.; pending installation of half interlocking plant, city is authorized to operate over C.N.R., crossing to be protected by watchmen to be appointed by C.N.R. and paid by city.

21939. May 29.—Ordering Canadian Northern Ry. to widen loading platform at Vegreville, Alta., to 20 ft., within one month.

21940. May 28.—Ordering Canadian Northern Ry. to build by July 1 a one-pen stockyard and loading chute at Wiseton, Sask.

21941. May 28.—Ordering Canadian Northern Ry. to file plan of fourth class station at Hughton, Sask., station to be erected and station agent appointed by July 15.

21942. June 5.—Authorizing Montreal and Southern Counties Ry. to build across parish line between St. Paul de Abbotsford and Granby Parishes, and public highways known as Little Road, Cannan Road and Robinson Road, Granby Parish, Que.

21943. June 5.—Authorizing Essex Terminal Ry. to open for traffic its line from C.P.R. to M.C.R. and Detroit Tunnel Co., Sandwich, Ont.

21944. June 5.—Authorizing Lake Erie and Northern Ry. to build reinforced retaining walls along Jubilee Terrace and Water St., Brantford, Ont., and span over its tracks for extension of Lorne Bridge.

21945. June 4.—Authorizing Okanagan Telephone Co. to erect its wires across Shuswap and Okanagan Ry. (C.P.R.) at Okanagan St., Armstrong, and at Gore St., Vernon, B.C.

21946. June 2.—Approving agreement between Bell Telephone Co. and Bobcaygeon Rural Telephone Co.

21947. June 4.—Extending collection and delivery limits of Dominion Ex. Co. in Banff, Alta., and rescinding order 18740, Feb. 20, 1913.

21948. June 4.—Authorizing G.T. Pacific Ry. to build across Government Road, B.C., at mileage 241 and 245, Yellowhead Pass West, Cariboo District, B.C.

21949. June 4.—Approving temporary diversion of C.P.R. at mileage 39.3, Sudbury Subdivision, Lake Superior Division, and to build at grade, for 5 months, temporary diversion across North Road, Parry Sound to Byng Inlet, Ont.

21950. June 2.—Authorizing C.P.R. to build its Weyburn-Stirling branch line across 15 highways at grade between mileage 253.35 and 277.78.

21951. June 5.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build 2 tracks at grade across Scugog St., Bowmanville, Ont., to proposed freight yard, all switching movements across Scugog St. to be flagged.

21952. June 5.—Authorizing C.P.R. to revise grade and build additional track by means of a bridge across Lorne St., Kamloops, B.C., and revise location from mileage 0.22 to 0.55.

21953. June 5.—Approving clearances at spur for Crown Feed and Produce Co., Calgary, Alta.

21954. June 5.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build spur across C.N. Ontario Ry. at mileage 1.05.

21955. June 5.—Authorizing City of Hamilton, Ont., to build Burlington St. across portion of road allowance claimed by Hamilton Radial Electric Ry. as forming part of right of way.

21956. May 22.—Ordering G.T.R. to build spur for Hepworth Silica Pressed Brick Co., Hepworth, Ont.

21957. June 8.—Authorizing G.T. Pacific Ry. to build bridge across Phillips Creek, mileage 102.2, Prince Rupert east, B.C.

21958. June 8.—Ordering that joint rate on coke, in carloads of a minimum weight of 40,000 lbs. a car, from Consumers Gas Co. siding on Esplanade, Toronto, to C.P.R. sidings at North Toronto, be reduced from 95c. to 60c. a ton of 2,000 lbs., effective by June 22.

21959. June 9.—Ordering C.P.R. to build farm crossing for D. Coyette, Lemoyne, Que., at his expense, to be completed within 30 days.

21960. June 9.—Approving location of G.T. Pacific Branch Lines Co. station at Avonhurst, Sask.

21961, 21962. June 9, 8.—Authorizing G.T. Pacific Ry. to build bridges across Ksi-Den Creek, mileage 147.3; Fiddler Creek, mileage 127; Porcupine Creek, mileage 133.5; Lorne Creek, mileage 129, and Kitwanger Creek, mileage 152, Prince Rupert East, B.C.

21963. June 8.—Extending to Nov. 4, time for G.T.R. to complete spur for Dominion Stove & Foundry Co., Penetanguishene, Ont.

21964. June 9.—Authorizing C.N. Ontario Ry. to build spur to ballast pit across public road between Cons. 1 and 2, Pembroke Tp., and operate same for 3 years.

21965. June 9.—Approving location of C.N. Ontario Ry. station at Ste. Dorothee (Isle Jesus), Que., mileage 39, Hawkesbury East.

21966. June 6.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across 13 highways in Alberta.

21967. June 9.—Relieving Michigan Central and Pere Marquette Rds. from erecting fence on boundary line between rights of way at points west of St. Thomas, Ont.

21968. June 9.—Ordering Dominion Ex. Co. to publish and file special tariff applicable to through shipments of milk or cream to Boston, Mass., establishing certain rates.

21969. June 11.—Dismissing applications of Sheldons, Ltd., Galt, Ont., and Sirocco Co., Windsor, Ont., for order reducing carload rating of heating and ventilating apparatus in Canadian Freight Classification from 5th to 6th class.

21970. June 5.—Authorizing Lake Erie and Northern Ry. to build railway across highway by subway between Cons. 8 and 9, mileage 37.36, Townsend Tp., Ont.

21971. June 9.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build spur, from main line, at mileage 87.16 from Glen Tay, to Lot 1, Ontario and Dundas Sts., Trenton, Ont.

21972. June 8.—Authorizing C.P.R. to build spur for Canmore Coal Co., Canmore, Alta.

21973. June 9.—Approving revised location of C.P.R. Swift Current Northwesterly branch from mileage 94.64 to 97.29, and from mileage 109.10 to 111.95.

21974. June 8.—Further extending time to Sept. 30 within which C.P.R. shall complete sidings for Godson Contracting Co., Darlington Tp., Ont.

21975. June 9.—Ordering C.P.R. to divert crossing into highway just west of Armilla, Sask.

21976. June 12.—Ordering G.T.R. to switch cars, when desired by the municipality, to and from track on Esplanade owned by Town of Cobourg, Ont.

21977. May 20.—Amending order 20507, Oct. 6, 1913, re siding for Dodge Mfg. Co., Toronto.

21978. June 15.—Ordering C.P.R., within 60 days, to install improved type of automatic bell at crossing of main approach to Hospital for Insane, London, Ont.; 20% of cost to be paid out of railway grade crossing fund.

21979. June 13.—Ordering Pere Marquette Rd., within 60 days, to install improved type of automatic bell at crossing of Head St., Chatham, Ont.; 20% of cost to be paid out of railway grade crossing fund; all train movements on siding to be flagged over by yardmen.

21980. June 8.—Approving agreement between Bell and King Telephone Cos.

21981. June 13.—Establishing collection and delivery limits of Dominion Express Co., in Morse, Sask.

21982. June 12.—Authorizing C.P.R. to open for traffic its line from Bassano to Empress, mileage 0.0 to 118.31, and from Empress, mileage 111.8 to 110.8, Swift Current Northwesterly Branch, trains from mileage 0 to 75, limited to 20 miles an hour; from mileage 75 to 118.3, and mileage 110.8 to 111.8, to 18 miles an hour.

21983. June 12.—Approving location of G.T. Pacific Branch Lines Co.'s station at Lorlie, Sask.

21984. June 13.—Authorizing G.T.R. to build siding for Sarnia Bridge Co., Sarnia, Ont.

21985. June 11.—Authorizing Dominion Atlantic Ry. to build siding for W. H. Chase & Co., Avonport, N.S.

21986. June 15.—Authorizing Lake Erie and Northern Ry. to connect temporarily with Michigan Central Rd. siding at Waterford, Ont.

21987. June 15.—Authorizing Esquimalt and Nanaimo Ry. to build siding for Spragge & Co., Victoria, B.C.

21988. June 13.—Authorizing C.N. Ontario Ry. to build temporarily across public road between Lot 19, R. 1, and Lots 23 and 24, North Front A, by spur to ballast pit, Westmeath Tp.

21989. June 13.—Authorizing C.P.R. to use bridges 30.8, near Kendry station; 33.5, near Cavan station, and 39.4, near Bethany Jct. station, Ont.

21990. June 15.—Amending order 21915, June 1, by substituting Ontario and Quebec Ry. for Campbellford, Lake Ontario and Western Ry.

21991. June 15.—Authorizing C.P.R. to rebuild bridge 34.6, Toronto Subdivision, at Cavan, Ont.

21992. June 8.—Authorizing G.T. Pacific Ry. to build bridges across creek, mileage 151; Shames River, mileage 79; Hardscrabble Creek, mileage 113.3; creek at mileage 115.8, and Sand Creek, mileage 115.1, Prince Rupert East, B.C.

21993. June 12.—Authorizing C.N.Ontario Ry. to open for traffic its Orillia Branch from Udney to Atherley, and rescinding order 11308, July 28, 1910.

21994. June 16.—Authorizing G. T. Pacific Ry. to build spur in s.e. ¼ Sec. 36-52-2, w. 5 m., for Alsip Brick and Supply Co.

21995. June 16.—Authorizing G.T.R. to rebuild bridge 301 across Indian River, near Thornbury, Ont.

21996 to 21998. June 16.—Amending orders 21114, Dec. 30, 1913, and 21495 and 21496, Mar. 17, 1914, re building of C.P.R. Bassano Easterly Branch across highways in Alberta.

21999. June 10.—Authorizing C.P.R. to build diversions in Secs. 19 and 29-7-27, w. 2 m., Sask., and to build its Weyburn-Stirling Branch, at grade, across north and south road allowance between Secs. 19 and 30, and Secs. 20 and 29-7-27, w. 2 m., mileage 94.36, and rescinding order 19746, July 4, 1913.

22000. June 15.—Ordering C.P.R. to build highway crossing in Lot 5, Con. 2, Rayside Tp., Ont.

22001. June 16.—Authorizing Winnipeg River Ry., to connect with C.P.R. at Lac Du Bonnet, Man.

22002. June 19.—Amending order 21890, May 27, re diversion and crossing of road by C.P.R. at mileage 105.23, Weyburn-Stirling Branch, Sask.

22003. June 19.—Amending order 21891, May 27, re C.P.R. siding for J. L. Lafleur, Notre Dame de Grace, Que.

22004. June 16.—Approving location of Canadian Northern Ry. through Tps. 18-20, R. 7, e.p.m., Man., mileage 48.56 to 62.72.

22005. June 10.—Authorizing Canadian Northern Ry. to build across and divert road in s.e. ¼ Sec. 7-43-19, w. 4. m., Alta.

22006. June 16.—Authorizing Canadian Northern Ry. to rebuild bridge across Red River, at Emerson, Man., subject to condition that it build guide pier or protection work should it be called upon to do so at any time by the Public Works Department of Canada, in the interests of navigation.

22007. June 8.—Approving agreement between Bell Telephone Co. and Brooke Tp., Ont.

22008. June 16.—Authorizing C.P.R. to build stringer opening at bridge 111.45, at crossing of Wellington St., Goderich, Ont.

22009. June 16.—Authorizing G.T.R. to rebuild bridge 35, over South Indian River, near South Indian, Ont.

22010. June 15.—Ordering Sarnia St. Ry. to pay cost of maintaining and repairing diamond to be installed at crossing of G.T.R., and rescinding order 21825, May 14, without prejudice to rights of either with reference to maintenance and repair under order 138.

22011. June 13.—Amending order 21751, Apr. 29, re C.P.R. and Ottawa and New York Ry. train service at Finch, Ont.

22012. June 16.—Relieving G.T.R. from providing further protection at crossing of Waterloo St., New Hamburg, Ont.

22013. June 17.—Approving proposed Supplement 3 to Canadian Freight Classification 16, as finally revised and submitted by Canadian Freight Association, June 10, and with which is consolidated Supplement 2, approved by order 20967, Dec. 10, 1913, to become effective with least delay necessary.

22014, 22015. June 17.—Authorizing G.T.R. to build siding for J. R. Booth, near Opeongo, Ont., and siding and spur for Ross Church Road Co., Godmanchester Tp., Que.

22016. June 17.—Approving City of Montreal plans B-1-1342-1 and B-1-1342-2, showing diagram of material and general details of steelwork and details of sidewalk brackets of subway to be built under C.P.R. at Park Ave.

22017. June 17.—Authorizing G.T.R. to build siding for Interprovincial Brick Co. of Canada near Cheltenham, Ont.

22018. June 15.—Authorizing Dominion Stock and Bond Corporation to build subways at Corporation and Government Sts. under G.T. Pacific Ry., Fort Fraser, B.C.

22019. June 16.—Authorizing Canadian Northern Ry. to operate between Saskatoon and Harris, Sask., 49.4 miles, at 25 miles an hour, instead of 20 miles, and relieving it from speed limitation of 15 and 20 miles an hour over portion from Harris to Kindersley, 76.7 miles.

22020. June 18.—Approving plan showing alterations and additions to C.N.R. station building at Alsask, Sask.

22021. June 16.—Approving clearances, as shown on plan of G.T.R. bridge over siding of Dominion Tire Co., Berlin, Ont.

22022, 22023, June 17, 18.—Authorizing G.T.R. to build sidings for Dominion Glass Co., Ltd., Toronto, and for Kirkfield Portland Cement Co., Somerville Tp., Ont.

22024. June 16.—Authorizing C.P.R. to build its Bassano Easterly Branch across 58 highways, mileages 0.82 to 50.95, with some diversions, in Alberta.

22025. June 17.—Extending to Aug. 1 time within which C.P.R. shall install electric bell at highway crossing at Port Haney, B.C.

22026. June 18.—Relieving Michigan Central Rd. from maintaining day and night flagmen at highway crossing about 2 miles west of Mull, Ont.

22027. June 18.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to include within limits of right of way shown on plans approved by orders 17204 and 17105, lands shown edged in red on plan referred to in book of reference dated June 8.

22028. June 10.—Authorizing City of Vancouver, B.C., to build highway over Vancouver, Victoria and Eastern Ry. at Venables St.

22029. June 8.—Ordering Esquimalt and Nanaimo Ry. to file plans showing culvert sufficient to drain lands of A. Gordon, Hillbank, B.C., for approval of Board's engineer, work to be completed within 2 months of approval, and upon completion A. Gordon to pay $50 towards expense.

22030. June 22.—Authorizing C.P.R. to open for traffic its double track from Herbert to Notman, mileage 91.9 to 95.1, Sask.

22031. June 22.—Authorizing Saskatchewan Government to build highway over C.P.R. blind line north of Sec. 15-30-22, w. 2 m., Sask.

22032. June 22.—Authorizing G.T.R. to build siding for Welch Grape Juice Co., Grantham Tp., Ont.

22033. June 22.—Approving location of C.N. Ontario Ry. station grounds at Vaughan, mileage 151.1 from Ottawa.

22034. June 23.—Authorizing Canadian Northern Ry. to build across 37 highways, mileage 44.84 to 93.85, Sask.

22035. June 22.—Authorizing Winnipeg, Selkirk and Lake Winnipeg Ry. to cross, for construction purposes only, until Sept. 1, C.P.R. Selkirk Branch, on certain conditions.

22036. June 17.—Approving agreement between Bell and Caradoc-Ekfrid Telephone Cos. of June 9.

22037. June 22.—Authorizing Shale Products, Ltd., to build aerial tramway over G.T.R. near Inglewood Jct., Ont.

22038. June 18.—Authorizing Department of Railways and Canals to build construction railway across Niagara, St. Catharines and Toronto Ry., at Lake Shore Road, Port Weller, Ont., in connection with Welland Ship Canal; Department to pay cost of interlocking plant.

22039. June 19.—Amending order 20240, Sept. 2, 1913, re Alberta Government highway across Canadian Northern Ry. in n.e. ¼ Sec. 30, Tp. 29, R. 20, w. 4 m.

22040. June 20.—Authorizing G.T. Pacific Ry. to build across Government Road Diversion in n.w. ¼ Sec. 21-53-7, w. 5 m., mileage 60.2, North Alberta District.

22041. June 19.—Authorizing G.T.R. to build siding for Pilkington Bros., Wainfleet Tp., Ont.

22042. June 22.—Amending order 19199, May 6, 1913, re C.P.R. crossing of 18 highways in Edmonton, Alta.

22043. June 19.—Authorizing C.P.R. to build siding for G. A. MacIver, Sherbrooke, Que.

22044. June 20.—Authorizing Lake Erie and Northern Ry. to connect with Toronto, Hamilton and Buffalo Ry., between station 866-92.5, in Waterford, and station 58-95.4, Townsend Tp., Ont.

22045. June 11.—Dismissing British Columbia Express Co.'s application for order directing G.T. Pacific Ry. to remove temporary bridge across Fraser River below confluence with Nechaco River, and make openings in permanent steel bridge across Fraser River, at mileage 142 and 189.

22046. June 18.—Authorizing Canadian Northern Ry., until Oct. 1, to carry traffic over its Oakland Branch from mileage 42 to end of track, Man., 12 miles; trains limited to 12 miles an hour.

22047. June 23.—Authorizing Town of Hanover, Ont., to build team track across Maple Ave.

22048. June 23.—Authorizing G.T. Pacific Ry. to build road diversion in s.w. ¼ Sec. 27, and n.e. ¼ Sec. 21-53-8, w. 5 m., mileage 864.6 west of Winnipeg.

22049. June 23.—Approving location of G.T. Pacific Ry. station at Hubert, mileage 239, Prince Rupert East, B.C.

22050. June 24.—Authorizing Lake Erie and Northern Ry. to build bridge at mileage 29.7, over Oakland Creek, Oakland Tp., Ont.

22051. June 24.—Authorizing Montreal Light, Heat and Power Co. to lay 30 in. gas pipe across G.T.R. right of way and lands and Lachine Canal Reserve, under lease by G.T.R., near western end of G.T.R. Turcot Yards, including lands formerly leased to T. A. Trenholme, Lachine Parish, Que.

22052. June 23.—Ordering that cost of interchange tracks as follows be paid:—at Waterloo, Ont., 85% by G.T.R. and 15% by Galt, Preston and Hespeler St. Ry.; at Berlin, Ont., 90% by G.P. and H.S.R., and 10% by G.T.R.; at Preston, Ont., 80% by G.T.R. and 20% by G.P. and H.S.R.; whole cost of interchange track at Galt to be paid by G.T.R.

22053. June 23.—Authorizing G.T. Pacific Branch Lines Co. to build highway crossing over its Regina-Boundary Branch, at mileage 43.3, Sask., and rescinding order 12181, Nov. 5, 1910.

22054. June 24.—Approving station site and station of G.T. Pacific Ry. at Duncan, mileage 187, Prince Rupert East, B.C.

22055. June 26.—Ordering that, commencing July 1, G.T.R. establish train service on its Haliburton Subdivision, as indicated on schedule marked A; that service be maintained for three months from July 1, as a trial, and records kept showing returns; that G.T.R. be permitted to carry only carload freight on said trains, and be at liberty to arrange whatever other service it deems necessary for less than carload freight.

22056. June 25.—Authorizing C.N. Ontario Ry. to build across public road between Lots 78 and 80, St. Eustache Parish, Que., mileage 37 1, by a subway, and rescinding order 12663, Dec. 20, 1910.

22057. June 26.—Authorizing Canadian Northern Ry. to build across and divert Government road allowance between Secs. 33 and 32-28-28, w. 3 m., Sask.

22058. June 25.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build its Trenton spur across certain streets in Trenton, Ont.

22059. June 24.—Authorizing Esquimalt and Nanaimo Ry. to open for traffic its Osborne Bay Branch from Osborne Bay to Westholme, B.C., about 2.5 miles.

22060. June 24.—Authorizing Vancouver and Lulu Island Ry. to open for traffic its branch from 3rd Ave., Vancouver, B.C., B.C. Electric Ry. property, adjoining 3rd Ave., and Granville St. bridge, to passenger and freight station.

22061. June 25.—Authorizing C.P.R. to open for traffic its double track from Oak Lake to Virden, mileage 32.2 to 47.5, Man.

22062. June 25.—Ordering that of 20% of cost of building foot subway, for overhead bridge at George St., Smiths Falls, Ont., not exceeding $5,000, less contribution already made for overhead bridge there, be paid out of the railway grade crossing fund.

22063, 22064. June 25.—Extending to Dec. 1 time for approval of tolls of C.P.R. and Great North Western Telegraph Co.

22065. June 25.—Authorizing City of Montreal to divert traffic now crossing C.P.R. tracks in line with Park Ave., by a temporary crossing to be built in line with Hutchinson St., crossing at Park Ave. to be closed, and crossing at Hutchinson St. be protected by day and night watchman at expense of applicant, pending building of subway at Park Ave.

22066. June 22.—Rescinding order 21848, May 18, re Bell Telephone Co.'s overhead line on Mountain St., Montreal.

22067, 22068. June 25.—Extending to Dec. 1 time for approval of telegraph tolls of White Pass and Yukon Route, and G.T. Pacific Telegraph Co.

22069. June 25.—Suspending clause of order 20621, Oct. 18, 1913, re G.T.R. siding for St. Marys Portland Cement Co., Blanchard Tp., Ont., pending settlement of terms of user by G.T.R. as between St. Marys Portland Cement Co. and C.P.R.

22070. June 29.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to open for traffic its line from Glen Tay to Agincourt, mileage 0 to 182.6, Ont., and rescinding order 21916, June 1.

22071. May 28.—Ordering C.P.R. to install 18 in. corrugated iron pipe under its tracks opposite Block 4, Plunkett, Sask., work to be completed by Sept. 1.

22072. May 28.—Ordering C.P.R. to build highway crossing at west end of station grounds, Viscount, Sask., to be completed by Sept. 1.

22073. May 28.—Ordering C.P.R. to grade driveway from highway crossing at west end of yard along station grounds to approaches to elevators, Plunkett, Sask., to lay 8 in. corrugated iron pipe under approach to private crossing at east end of yard, and grade approaches to crossing, work to be completed by Sept. 1.

22074. May 28.—Dismissing application Viscount rural municipality 341, Sask., for order directing C.P.R. to build permanent crossing east of Plunkett.

22075. June 24.—Ordering C.P.R. to deepen partially made ditch through Viscount station grounds, Sask., to sufficient depth for a 0.2% grade, and lay 18 in. corrugated iron pipe under track and graded road, grade driveway from highway at west end of yard along station grounds to elevator approaches, work to be completed by Sept. 1.

22076. May 26.—Dismissing Winnipeg Electric Ry. application for order varying order 11393, Aug. 15, 1910, by dispensing with services of watchmen at Logan Ave.

22077. June 29.—Approving location of Canadian Northern Ry. station at Elross, Sask., to be in accordance with C.N.R. 3rd class station plan.

22078. May 29.—Authorizing Canadian Northern Ry. to carry traffic over its line between Avonlea and Gravelburg, Sask., 79 miles, until Oct. 1.

22079. June 24.—Approving location of G.T.R. signals in Union Station yard, Toronto.

22080. June 30.—Ordering G.T.R. to operate gates at crossing of Main St., Wyoming, Ont., between 7 p.m. and 7 a.m.

22081. May 26.—Dismissing application of Tuxedo Park Co., Canada Cement Co., and South Winnipeg, Ltd., for order directing G.T. Pacific Ry. to receive, forward and deliver traffic upon and from existing spur serving applicants' property in St. Boniface and St. Charles Parishes, Man.

22082. June 2.—Rescinding par. 2 of operative part of order 21731, May 1, re operation of G.T. Pacific Ry. ladder track on Kinistino Ave., Edmonton, Alta.

22083. June 10.—Ordering that Brunette St., New Westminster, B.C., be protected by gates, installed by Vancouver, Victoria and Eastern Ry. and Navigation Co. (G.N.R.), 20% of cost to be paid out of the railway grade crossing fund, 2-3 of remainder by V.V. and E.R., and 1-3 by City of New Westminster; cost of maintenance and wages of watchmen to be paid in same proportion; British Columbia Electric Ry. being relieved of payment of 1-3 of wages of watchman.

22084. June 25.—Ordering Canadian Northern Ry. to build grain loading siding between Dauphin and Ashville, Man.

22085. June 10.—Ordering that, until further ordered, certain trains shall continue to carry additional cars placed in service on June 5 between New Westminster and Vancouver, B.C.

22086. May 26.—Authorizing Canadian Northern Ry. to build spur for J. H. Carleton, Winnipeg, Man.

22087. May 26.—Ordering Great Northern Ry. to build good roadway from east and west road allowance at south end of station grounds to point opposite head block of present location of commercial track switch, about 1,000 ft., at Layland, Man., and grade and level to width of 20 ft., and put in proper condition, loading platform there, work to be completed by Aug. 15.

22088. May 26.—Dismissing application of John Thomas, Winnipeg, Man., alleging excessive charges on cordwood from Richan, Ont., to Winnipeg, Man., and for rebate of at least $7 a car on 435 cars.

22089. June 30.—Authorizing G.T. Pacific Branch Lines Co. to carry traffic over its Moose Jaw Northwest Branch between Mawer, mileage 44.9, and mileage 64.6, speed of trains limited to 15 miles an hour.

22090. June 27. Authorizing Canadian Northern Ry. to build bridge across Ochre River, mileage 164.26, Man.

22091. May 26.—Ordering C.P.R. to build spur from its "D" yard, across Sutherland Ave., Winnipeg, for B. Shragge Iron and Metal Co.

22092. June 29.—Authorizing Windsor, Essex and Lake Shore Rapid Ry. to build siding, crossing Pearl and Main Sts., Kingsville, Ont.

22093. June 30.—Dismissing application of Western Canada Stone Co. for extension of express collection and delivery limits in Calgary, Alta.

22094. July 2.—Authorizing C.P.R. to build its Bergen cutoff across its Lac Du Bonnet Subdivision at Murdock, Man.

22095. July 2.—Dismissing application on behalf of estate of late Mary Silles for order directing Canadian Northern Ry. to pay for damages sustained by building of spur across Lot 3, Con. 3, Neebing Tp., now in Fort William, Ont.

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22096. July 3.—Approving Kootenay Central Ry. revised location from southern boundary of Lot 6615, East Kootenay District, B.C., mileage 47.04, to northern boundary of Shuswap Indian Reserve, mileage 96.16.

22097. July 3.—Approving revised location of C.P.R. Moose Jaw Southwesterly Branch from mileage 43.97 to 46.56, Sask., and authorizing building of its Swift Current Southwesterly Branch at grade across highways between mileage 43.97 and 46.56.

22098. July 2.—Dismissing application of Board of Trade, Lawson, Sask., for order directing C.P.R. and G.T. Pacific Ry. to install transfer track in Moose Jaw, Sask.

22099. July 2.—Dismissing application of Board of Trade, Calgary, Alta., for order directing building of spur on C.P.R. at Nightingale, Alta., to connect C.P.R. with Canadian Northern Ry. for interchange of traffic.

22100. July 2.—Dismissing application of A. Low, Calgary, Alta., complaining of refusal of C.P.R. to allow him privilege of chartering train for Sunday school excursion to Banff.

22101. June 30.—Ordering Canadian Northern Ry., within 60 days, to erect third class station at Craigmyle, Alta.

The Death of Dean Galbraith.

John Galbraith, M.A., LL.D., M. Can. Soc. C.E., Dean of the Faculty of Applied Science, University of Toronto, died at his summer home, Go-Home, Muskoka, July 22. He was born at Montreal, Sept. 5, 1846, and received his primary education at Port Hope Grammar School. He entered the University of Toronto in 1863 and took his B.A. degree with double scholarship in mathematics and general proficiency, and the gold medal in mathematics, as well as being Prince's prizeman in 1868. He received his M.A. degree in 1875, and the honorary degree of LL.D. in 1902. In addition the honorary degree of LL.D. was conferred on him by Queen's University in 1902. Following graduation he studied engineering and surveying under G. A. Stewart, Chief Engineer, Midland Ry. (Ontario), subsequently attaining the rank of P.L.S. and D.L.S. He was employed in the building of the Intercolonial Ry., the Midland Ry., and the Canadian Pacific Ry.

On the formation of the Ontario School of Practical Science, in 1878, he was appointed to the chair of engineering, as well as being Principal, and when that institution became the Faculty of Applied Science of the University of Toronto, he was given the title of Dean. To him, the old school as it was familiarly known by its graduates, owes much of its success, as it was his tireless energy in promoting the welfare of the institution from its early days when a small building and a staff of three comprised his entire charge, to the present day, when there are three large buildings, a large staff of instructors, and about 800 students. In the engineering profession he was well known. He was one of the founders of the Canadian Society of Civil Engineers, of which he was for many years a councillor, and President in 1908. He was also an associate of the Institute of Civil Engineers of England, and in 1907 he was a member of the Royal Committee appointed to investigate the failure of the Quebec bridge, then in process of erection.

The funeral, which took place at Toronto, July 25, was largely attended by members of the engineering profession, many of whom had graduated under the late Dean.

Freight and Passenger Traffic on the Intercolonial Railway.

Replying to questions in the House of Commons, recently, the acting Minister of Railways gave the following particulars regarding freight and passenger traffic on the I. R. C. for the year ended Mar. 31, 1913:—

FREIGHT.—Number of tons carried, eastbound, 2,182,084; westbound, 3,021,385; total, 5,203,469. Originating in Nova Scotia and including 99,308 tons delivered at seaports of the Province for furtherance by rail, 2,693,024 tons. Originating in New Brunswick, 799,824 tons. Originating in Quebec, 1,088,406 tons.

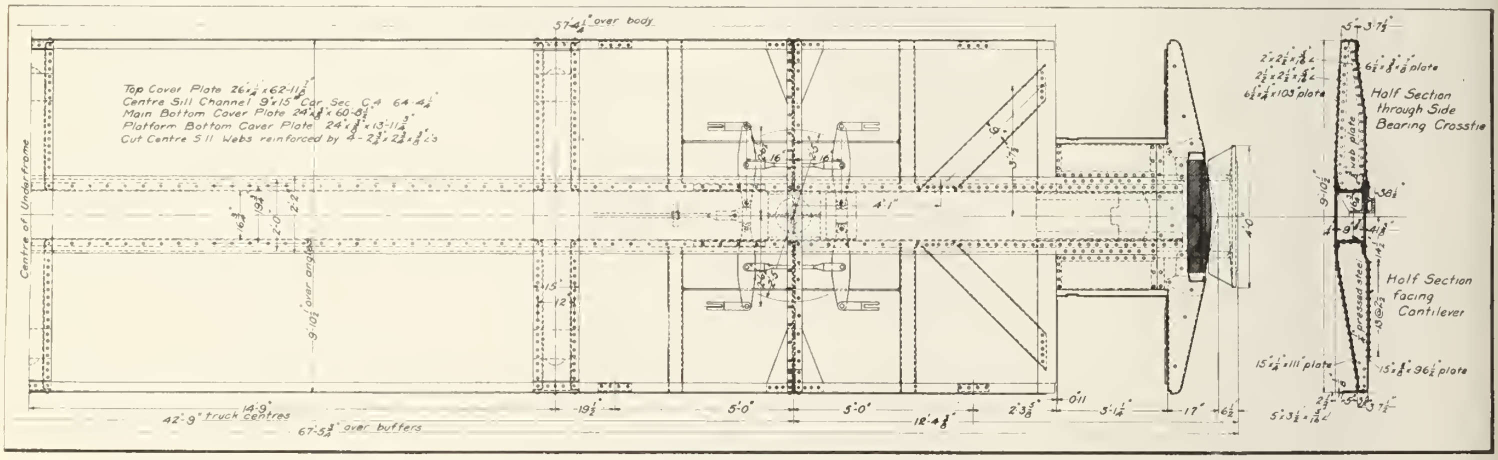
PASSENGER.—Total received for tickets sold to passengers, $2,643,766.63. Traffic originating in Nova Scotia, $1,128,640.07; traffic originating in New Brunswick, $670,343.47; traffic originating in Quebec, $844,783.09.

Rails for Canadian Northern Ry.—The Dominion Iron and Steel Co., Sydney, N. S., commenced making deliveries early in July of the 45,000 tons of steel rails ordered by Mackenzie, Mann & Co., Ltd., for July to September delivery. They are being supplied in 60, 65 and 80 lb. weights, deliveries being made at Port Arthur, Ont., Port Mann, B. C., and on Vancouver Island.

Steel Multiple Unit Cars for Mount Royal Tunnel.

The C.N.R. has ordered 8 all-steel, electrically operated, multiple unit cars for suburban service through its tunnel under Mount Royal, Montreal.

In the underframing, a plan of which is given herewith, the central box girder construction will comprise two 9 in. 15 lb. channels, 64 ft. 4¼ ins. long, spaced 16¾ ins. back to back, and fitted with a top cover plate, 28 by ¼ ins. by 62 ft. 11⅞ ins. long, a main bottom cover plate 24 by ⅜ ins. by 60 ft. 8½ ins. long, and two platform cover plates 24 by ⅜ by 13 ft. 11¾ ins. long. This box girder will extend from end to end of the car, with cast steel buffer castings on the ends. Where the webs of the channels are cut, the cross-sectional area of the original girder will be maintained by the use of four 2¾ by 2¾ by ⅜ in. angles. This construction is all shown in the plan. The centre filler at the centre plate is to be of cast steel, and the centre plate is to be of C.N.R. standard contour, to take the standard malleable iron centre plate used on C.N.R. passenger trucks. This centre girder will be assembled with the bottom of the sills upwards, and allowed to deflect, so that when reversed the camber will be allowed to straighten out by the weight of the metal. The body end sills will be built up of structural shapes.



Underframe of Multiple Unit Steel Cars for Mount Royal Tunnel.

The body bolsters will have a web plate, 9½ by ⅜ ins., and double top stiffener angles 2½ by 2½ by 5-16 ins., and bottom angles of 2 by 2½ by 5-16 ins., with top cover plate extending across top of centre girder, 6½ by ¼ by 103 ins., and a bottom one, 6½ by ⅜ by 78 ins., with the stiffener angles cut and bent around to form angle connection to the side sill angles and centre sill channels.

The cantilevers, of which there will be three, are to be located at 14 ft. centres, and will be formed of double pressed steel diaphragms, ¼ in. thick, with flanges formed to take a top cover plate, 15 by ¼ by 111 ins., and a bottom cover plate, 15 by ⅜ by 96½ ins., with the rivet gauge set at 12 ins. There will be about 35 cross supports of 5 in. 6½ lb. channels, to support the electrical and air brake apparatus under the car.

The side sills, of 5 by 3½ by 5-16 in. angles, will extend from end sill to end sill, and form a connection for the sheeting, bolsters, cantilevers and equipment supports. A pressed steel channel brace, ⅜ in. thick by 9 ins. wide, secured to the end and centre sills, will be located at each corner of the underframe.

In the side framing, the main side posts, which are to be continuous from side sill to the plate, will be 3 by 2 by 5-16 in. angles, acting as stiffeners for the side sheeting, suitably connected to the wooden side posts, which are to be 1¾ by 4⅛ in. long leaf yellow pine, B.C. fir or white ash. At the belt rail, the sheeting is to be further stiffened and tied in conjunction with the 3-16 in. pressed steel sash rests, by a 4 by ½ in. bar, extending the full length of the body in one place. Above the belt rail, the main piers will be fitted with steel casings, with the outer end portions rivetted on and formed to serve as sash stops. The window posts are to be encased on the outside with a U-shaped plate of ⅛ in. steel, forming the sash stop.

The corner posts are to be built of 3 by 2 in. angles, with 3-16 in. pressed steel cover plate, extending around and over the side and end sheets. The door posts will consist of 4 in. channels, having casings of 3-16 in. pressed steel, which will include and secure the end sheets and door finish inside the car. The belt rail will be of 3-16 in. pressed steel plate. The side plate will be of 3 by 3 by 3-16 in. angles, continuous in one piece, the full length of the body, each side, and fitted with extensions each end, to include and form the vestibule face carline. The letter board is to be ⅛ in. steel plate, rivetted to the side plates, and stiffened on the lower edge by a 1 by 1⅜ by ⅛ in. angle.

The sash rests will be of 3-16 in. plate, having a continuous stiffener the full length of the body in one piece of 4 by ½ in. steel bevelled on the top edge to suit the slope of the sash rest. The side sheets or plates are to be 0.11 in. thick, preferably cold rolled, and to be coated with a layer of cork paint on the inside when applied. The outside roofing is to be of steel plate, 0.09 in. thick, coated inside with cork paint, and supported on channel shaped pressed steel carlines ⅛ in. thick, except the three carlines supporting the pantograph, which will be of 3-16 in. pressed steel. The roof plates will be secured by ¼ in. rivets, with the plate edges butted and welded together, and all the rivets sweated and soldered so as to be watertight. The eaves moulding will be of ⅛ in. pressed steel. The roof frame will be braced longitudinally by seven stringers, 1 in. thick by 1¾ in. wide. There will be a stringer, 2 by 3 in., in the roof framing, 2¾ ft. each side of the car centre line, to form a support for the lamps. The end plates, extending from side plate to side plate in one piece, will be of 4 in. channels. There will be safety chain hooks, links and brackets in accordance with C.N.R. standards.

The vestibule corner posts and diaphragm post casings will be 3-16 in. pressed steel, and the vestibule end sheeting will be the same as the body sheeting, as will also the body end sheets. The floor plates will be ¼ in. thick. The diaphragm posts will be 5 in. 9 lb. channels. The vestibule floor covering will be of 5-16 in. pebbled dot rubber. The vestibule windows will be circular, of double thickness, 19 ins. diam., 7-16 in. thick, of heat resisting clear glass.

There will be 8 windows per car. The two end doors will be fitted with round stationary sash, the glass in which is to be heat resisting and wired, 19½ ins. diam.; two body end doors, with drop sash and double lights of heat resisting glass, 15 by 17 ins.; and four vestibule side doors with drop sash and two lights of ¼ in. plate glass, one 10¼ by 25 ins., and the other 23½ by 25 ins. The door trimmings will be C.N.R. standard. The car lighting will be from a 600 volt generator under the car, the lighting circuits from which will be divided into five lines.

The cross seats of the cars are to be of the C.N.R. low back style, with corner diagonal style of grab handles, and upholstered in canvas backed rattan. The interior woodwork is to be birch natural finish, with the ceiling of 3 ply poplar veneer, canvas faced The end finish will be of 0.06 in. steel plate.

Each of the cars will be supplied with 4 CGE-239 motors, of the commutating pole type, fully ventilated, wound for 1,200 v. and insulated for 2,400 v. Two of these motors will be permanently connected in series for 2,400 v. operation. Their standard rating will be 125 h.p. each, or a total of 500 h.p. per car. In the construction of these fully ventilated motors, the pinion end frame will be provided with a ring which will divert the air discharge from the armature fan through the openings in the head, while the incoming air will be drawn through a screened intake. This construction will insure a definite longitudinal circulation of air through the whole interior of the motor.

The Sprague GE type M multiple unit control will be provided, the design arrangement and construction being such that it will be equally well adapted for either single car or train operation. The control equipment will include a motor generator set for supplying 600 v. current for the control circuits, air compressor and lights. This set will consist of two 1,200 v. motors, operating in series at 2,400 v., direct connected to a 600 v. generator. The construction of the motors and the control apparatus will be essentially of the same general type as for the corresponding items used on the electric locomotive equipments, which were fully described in Canadian Railway and Marine World for June.

The method of heating the cars will be very satisfactory on account of the excellent distribution of hot air secured. The heating equipment will consist of a heating unit, blower and regulating mechanism, the controlling switch and thermostat of the regu-

lating mechanism being arranged for operation from the 600 v. supply. Air will be forced over the heating unit and distributed to the car through 4 by 10 in. air ducts along the sides of the car.

The following will be the principal dimensions of the cars:—

Length over buffers	67 ft. 5¾ ins.
Length over body corner posts	57 ft. 6¼ ins.
Length over body	57 ft. 4¼ ins.
Truck centres	42 ft. 9 ins.
Cantilever centres	29 ft. 6 ins.
Width over side sill angles	9 ft. 10½ ins.
Width over cantilevers	9 ft. 10¾ ins.
Width over eaves	10 ft. 2¾ ins.
Height, top of rail over roof	13 ft. 0 ins.
Height, top of rail to underside of side sill	3 ft. 7½ ins.
Height, top of rail to underside of centre sill channels	3 ft. 5¾ ins.
Height, top of rail to underside of body centre plate	3 ft. 2½ ins.
Height, underside of side sill to top of side plate angle	7 ft. 3 5-16 ins.
Centre to centre of body side bearings	4 ft. 10 ins.
Centre to centre of deck sills	5 ft. 6 ins.
Approximate weight of car under working conditions	120,000 lbs.

The cars will be built by the Pressed Steel Car Co. We are indebted to A. L. Graburn, Mechanical Engineer, C.N.R., and W. G. Gordon, Transportation Engineer, Canadian General Electric Co., for the data on which this article is based.

National Transcontinental Railway Construction.

The work of completing the N. T. R. has, owing to the resignation of R. W. Leonard, who has been the sole commissioner in charge of construction since 1912, passed under the control of the Minister of Railways, as provided for by the act passed last session of the Dominion Parliament. The various officers of the commission are being retained by the Department.

The filling, ballasting, bridgework, station building and other finishing up work is expected to be completed by Sept. 30, when the entire line will be ready for taking over by the Grand Trunk Pacific Ry. It is reported that arrangements for this are under discussion, and that a board of arbitration will be appointed to definitely fix the capital cost of the line, on which the rental to be paid by the G. T. P. R. is to be fixed. The Department of Railways has power to operate the line in whole or in part up to the time of the transfer. The only part of the line at present operated by the G. T. P. R. is that from Winnipeg to Lake Superior Jct., Ont., where connection is made with the branch G. T. P. R. line running to Fort William.

Pending the completion of the Quebec Bridge connection will be made between Levis and Quebec, by means of a car ferry. The ships and the connecting lines for this are practically completed. The car ferry, which has been named Leonard, had her trial trips at Liverpool, Eng., July 20, and it is expected she will be delivered at Quebec by the end of August.

Construction is being steadily progressed with on the Quebec Bridge. The substructure work is completed, and the contractors for the steel work have the approach spans erected, and are erecting the anchor spans. The construction of the different members for the two cantilevers, and the connecting link for the 1,800 ft. central span, is being proceeded with. The laying out of the yards, and other work at the bridge site is being done by M. P. and J. T. Davis.

A contract is reported to have been let to W. J. Gosselin, Levis, Que., for the erection of a station building and covered platform on the Champlain Market site, Quebec, at an estimated cost of $46,000. It was originally intended to build the main station on this site, but it was subsequently decided to use the site for a station for local traffic only, and to have the main terminals elsewhere.

In connection with the projected line from Montreal to the N. T. Ry., we are officially advised that it is expected surveys will be commenced this year, although it may not be possible to do any construction. The total cost of the line is put at about $15,000,000. No definite ideas have been formed as to the possible route, but reports state it is not impossible that the one laid out from Montreal to Belle River, partly surveyed by the North Ry., will be utilized.

Tenders will be received to Aug. 4 for building of a Y track at Cap Rouge, about 2.5 miles westerly from Quebec bridge, and for the repair and completion of the line to the St. Malo shops.

Grand Trunk Pacific Railway Construction.

Collingwood Schreiber, General Consulting Engineer to the Dominion Government, arrived in Vancouver, July 4, from Prince Rupert, having completed a trip of inspection over the line. He is reported to have stated that he found the line to be in excellent shape between Winnipeg and Edmonton; in fair shape between Edmonton and McBride, and rapidly assuming a finished condition on the other sections to Priestley, whence a train service is being operated to Prince Rupert, 337 miles, over a good roadbed. A train service is in operation westerly from Winnipeg to McBride, 342 miles west of Edmonton; and several trains are in operation thence to Fort George, 144 miles further west. The intervening distance to Priestley, 140 miles is being ballasted, and only work trains are being operated over it. The line, he added, is expected to be in good running order throughout by the middle of August.

The bridge over the Fraser River was reported completed July 3, sometime after Mr. Schreiber's visit, and it is reported that trains are now being run through from Winnipeg to Fort George, 1,729 miles.

M. Donaldson, Vice President and General Manager, who returned to Winnipeg, July 3, from Montreal, is reported as stating that the line would be ready for freight traffic, right through, Aug. 1, and that arrangements were being made for starting through traffic on that day.

Grand Trunk Pacific Branch Lines.—The question of the entry of the line from Harte into Brandon, Man., was recently before the Board of Railway Commissioners, when the Brandon Board of Trade asked for an order to compel the company to use the Canadian Northern Ry. line and terminals. The C. N. R. objected, on the ground that it was acquiring additional land to enlarge its terminal for accommodation of its own traffic, and the G. T. P. Ry. objected on the ground that it had an agreement to use the Great Northern Ry. terminals, and the transfer track. The city objected to the use of this track. The Commissioners subsequently went over the ground and deferred judgment.

A train service has been put in operation from Talmage into Weyburn, Sask.

The Mayor of Moose Jaw, Sask., received a cheque for $30,000, July 6, from the company for six acres of the exhibition grounds for terminal purposes.

Work is in progress in clearing the site of the North West Mounted Police Barracks in Calgary, Alta., and it was expected that the whole of the grading of the cleared area would be completed by July 30. Track laying is to be started at once in the yards. (July, pg. 336.)

Petroleum Railway Rate Cases Decided by Privy Council.

A London, Eng., cablegram, of July 14, says: "The Privy Council to-day delivered judgment in the consolidated appeal of the Canadian Pacific Ry. versus the Canadian Oil Co. and the British American Oil Co. The dispute arose over through rates charged by railways on petroleum from Ohio and Pennsylvania to Toronto and other Canadian centres, when the official tariff classification did not specify a certain rate for petroleum. The Privy Council, in its judgment, says: 'It is admitted that the joint tariff was filed, and it is admitted that the companies did not, so far as the classification is concerned, make use of the classification which the Board of Railway Commissioners has prescribed or authorized, but availed themselves of the liberty given them to use a classification in use in the United States. What, however, the railway companies sought to do by means of their so-called supplements was to introduce a classification which was neither the classification in use in the United States nor a classification authorized by the board, for no one says the board ever authorized the charges proposed by the so-called supplements."

"This, in their Lordships' judgment, was quite beyond the railway companies' powers, with the result that they proceeded to exact charges which were not sanctioned by any joint tariff framed with classification in a way in which the statute permits it to be framed. Upon this ground, and without entering into the other matters argued, their Lordships are of the opinion that the Supreme Court was right in upholding the jurisdiction of the Board to make the order it did. The appeal was, therefore, dismissed."

The original orders made by the Board of Railway Commissioners in these cases, no. 14386, May 16, 1911, on application of British American Oil Co. Ltd., and 14387, May 16, 1911, on application of Canadian Oil Companies, Ltd., were published in Canadian Railway and Marine World for Oct., 1911, pg. 951. In those orders it was declared that the legal rates chargeable on petroleum and its products from Illinois, Ohio, and Pennsylvania to Toronto were the 5th class joint through rates in effect at the time the shipments moved, as shown in the joint through tariffs published and filed with the Board, and in accordance with official classification 29 and subsequent issues thereof. The Board passed orders 15297 and 15309 Nov. 9, 1911, allowing the C.P.R. and G.T.R. to appeal to the Supreme Court on questions of law. The Supreme Court upheld the Board's decision and the railway companies then appealed to the Privy Council.

The Minaki Inn, built by the Grand Trunk Pacific Ry. at the crossing of the Winnipeg River by the National Transcontinental Ry. main line, 115 miles east of Winnipeg and 334 miles west of Fort William, was opened July 2. It is under the Canada News Co.'s management and has accommodation for 350 guests. Morley Donaldson, Vice President and General Manager, G.T.P.R., presided at the opening dinner, and there were also present J. E. Dalrymple, Vice President, G.T.P.R. (traffic), and W. P. Hinton, Assistant Passenger Traffic Manager, G.T.P.R., who, in speaking, said that the hotel was built to supply a holiday home for Winnipeg business men and their families. A feature of the opening was an exhibition of moving pictures, depicting scenes during the construction of the G.T.P.R., and the linking up of the track on the Mountain Division last spring.

Mainly About Transportation People.

SIR THOS. TAIT and his wife and daughter are staying at Rockland, Me.

SIR EDMUND OSLER, M.P., director C.P.R., left Toronto early in July for Europe.

G. A. E. Bury, son of GEORGE BURY, Vice President, C.P.R., was operated on at Winnipeg, July 9, for appendicitis.

D. CAMPBELL, Local Manager, Elder Dempster Co., Montreal, was in Great Britain during July.

R. M. BOYD, General Agent, Chicago, Milwaukee and St. Paul Ry., Seattle, Wash., was reported to be seriously ill there during July.

SIR WILLIAM VAN HORNE, according to a London cablegram of July 7, has been motoring in Holland and France with his son.

W. H. CLANCY, City Ticket Agent, G.T.R., Montreal, sailed on the s.s. Megantic, July 4, for Europe, on a three months holiday trip.

A. L. HERTZBERG, M.Can.Soc.C.E., Division Engineer, C.P.R., Toronto, and Mrs. Hertzberg, are spending some time in Europe.

J. J. HILL, formerly President and Chairman of the Great Northern Ry., was in Montreal early in July, on his annual yachting cruise.

SIR WILLIAM MACKENZIE, President, Canadian Northern Ry., sailed from New York on the s.s. Aquitania, July 22, for England.

A. J. STONE, heretofore General Manager, Erie Rd., has been appointed Vice President, in charge of operation. Office, New York, N.Y.

Mrs. C. E. E. USSHER, wife of the Passenger Traffic Manager, C.P.R., and the Misses Ussher, are spending the summer at Gloucester, Mass.

SIR WILLIAM VAN HORNE, who was in Paris, France, in July, is reported to have said that he intended visiting Cuba before returning to Canada.

D. O. WOOD, General Western Freight Agent, Allan Line Steamships, Toronto, and Mrs. Wood, are at their summer cottage at Honey Harbor, Georgian Bay.

SIR THOMAS TAIT, President, Fredericton and Grand Lake Coal and Ry. Co., Montreal, has been elected a director of Ames, Holden, McCready, Ltd.

R. McGILL, one of the magistrates of Flesherton, Ont., and formerly for about 20 years C.P.R. agent there, died suddenly, during the course of a case, June 26.

Mrs. A. D. MacTIER, wife of the General Manager, Eastern Lines, C.P.R., with her daughter and son, returned to Canada at the end of July, after a visit to Europe.

LOUIS KON, Immigration Agent, Grand Trunk Pacific Ry., Winnipeg, has been elected Secretary of the Western Canada Railway Club, Winnipeg, vice W. H. Rosevear, resigned.

Mrs. HUGH SUTHERLAND, wife of the Executive Agent, Canadian Northern Ry., returned to Winnipeg from England, July 12, Mr. Sutherland remaining in London for a little longer.

MRS. D. B. HANNA left Toronto, July 20, with her daughter, mother and a sister, to spend some weeks at Kennebunkport, Me. Mr. Hanna accompanied them, but returned to Toronto in a few days.

W. WOOLLATT, of Walkerville, Ont., formerly General Superintendent, Buffalo Division, Pere Marquette Rd., is Vice President of the Albert Residence for men, a recently organized semi-charitable institution for providing respectable living accommodation in Windsor, Ont., for men earning small wages.

The will of the late HON. W. GIBSON, railway contractor, etc., Beamsville, Ont.,

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D. H. Mapes,
Superintendent of Building Construction, Eastern Lines, Canadian Pacific Railway.

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J. K. McNeillie,
Superintendent, District 3, Eastern Division, Canadian Pacific Railway.

which was filed for probate recently, disposes of an estate of between $800,000 and $900,000 between his widow and five daughters.

SIR ROBERT W. PERKS, who is interested in the proposed Georgian Bay ship canal, was presented with the silver medal of the Royal Society of Arts, in London, Eng., recently, for his paper on the Montreal, Ottawa and Georgian Bay Ship Canal.

In the list of birthdays of transportation men published in our July issue, by an uncorrected error in our records, the birthday of GEORGE STEPHEN, General Freight Agent, Canadian Northern Ry., Winnipeg, was given as July 5, 1870 instead of July 5, 1876.

W. DOWNIE, General Superintendent, Atlantic Division, C.P.R., St. John, N.B., who has been travelling during a 12 months leave of absence, accompanied by Mrs. Downie, was a passenger on the s.s. Empress of Britain, arriving in Canada from Great Britain, early in July.

BION J. ARNOLD, of Chicago, has been retained by the Jersey City Chamber of Commerce as consulting engineer on projected improvements in the city's commercial and industrial facilities. The work contemplated includes the construction of docks and a connecting railway.

R. M. BOYD, General Agent, Freight Department, Chicago, Milwaukee and St. Paul Ry., Seattle, Wash., died there, July 6, aged 45. He was born at Brockville, Ont., and entered railway service with the C.P.R., at the age of 14, and subsequently went to Seattle in Northern Pacific Ry., later transferring to the Chicago, Milwaukee and St. Paul Ry.

The Prince Rupert, B.C., Board of Trade is arranging for a presentation of a souvenir to E. J. CHAMBERLIN, President, G.T.R. and G.T. Pacific Ry., in commemoration of the opening of the road to that city. Silver has been obtained from a mine at Hazelton, B.C., as it is intended that the souvenir shall be manufactured from the natural products of the locality.

When the Governor General was visiting in Newfoundland recently, he laid the corner stone of the tuberculosis sanatorium which was given by W. D. REID, President, Reid Newfoundland Co. This was supplemented by gifts from H. D. REID, Vice President, and R. G. REID, Superintendent, R. N. Co., of 17 smaller hospitals for the preliminary treatment of patients, in various parts of the colony.

DEMAREST HARING MAPES, whose appointment as Superintendent of Building Construction, C.P.R., Montreal, was announced in a recent issue, was born at Monroe, Orange County, N.Y., Aug. 18, 1869, and entered C.P.R. service, July 16, 1912, as assistant to Superintendent of Building Construction, which position he held until May 16, 1914, when he was appointed to his present position.

L. C. FRITCH, Assistant to President, Canadian Northern Ry., Toronto, who is a past president of the American Railway Engineering Association, is chairman for this year of that Association's committee to outline work for the standing committees. W. McNAB, Principal Assistant Engineer, G.T.R., Montreal, another past president of the Association, is chairman of the library committee and of the special committee on the Manual.

JAMES B. GAUT, whose appointment as Superintendent of Bridges and Buildings, Western Lines, G.T.R., Chicago, Ill., was announced in our last issue, was born at Marietta, Ga., Sept. 25, 1872, and entered railway service Sept. 1, 1900, since when he has been, to Sept. 1, 1912, Assistant Engineer, Illinois Central Rd., Chicago; Sept. 1, 1912, to Dec. 1, 1913, General Bridge Inspector, G.T.R., Montreal; Dec. 1, 1913, to Apr. 22, 1914, Assistant Engineer on Valuation, Western Lines, G.T.R., Montreal.

ALLYN O. SEYMOUR, who has been appointed General Tourist Agent, C.P.R., Montreal, was born at Ogdensburg, N.Y.,

Aug. 14, 1887, and entered C.P.R. service in Aug. 1903, since when he has been, to Dec., 1904, clerk in general ticket department, Montreal; Jan., 1905, to Dec., 1909, clerk and assistant chief clerk, Passenger Traffic Manager's office, Montreal; Jan., 1910, to Oct., 1911, chief clerk to General Tourist Agent, Montreal; Nov., 1911, to June 30, 1914, General Travelling Passenger Agent, Montreal.

J. N. SUTHERLAND, who died at Oakville, Ont., July 18, was born at Sydney, N.S., in 1843, and entered railway service in 1866 as ticket clerk on the Great Western Ry. at Suspension Bridge, Ont., subsequently becoming joint ticket agent for the G.W.R. and M.C.R. at Rochester, N.Y., and afterwards station master, G.W.R., St. Catharines, Ont. He entered C.P.R. service on the opening of the Montreal-Toronto line at the Toronto Union station, subsequently becoming Local Freight Agent, Queen's Wharf, Toronto, and afterwards General Freight Agent, Ontario Division; and on Jan. 1, 1896, he was appointed General Freight Agent, Atlantic Division, St. John, N.B., which position he held until his retirement from railway service in April, 1907.

ERNEST BAXTER, who was recently appointed Purchasing Agent, St. Louis Southwestern Ry., St. Louis, Mo., was born at Delmer, Ont., Oct. 11, 1882, and entered railway service as messenger Michigan Central Rd., in Mar. 1903. From May to Sept. 1903 he was clerk, Algoma Central and Hudson Bay Ry., Saulte Ste. Marie, Ont.; Oct. 1903 to Mar. 1905, secretary to Superintendent, G.T.R., London, Ont.; Apr. 1905, to Feb., 1906, in operating department, Cincinnati, Hamilton and Dayton Ry., Indianapolis, Ind., and Missouri Pacific Ry., St. Louis, Mo.; Feb. 1906 to Apr. 1909, secretary to General Manager, St. Louis Southwestern Ry., St. Louis, Mo.; Apr. 1909 to June 22, 1914, chief clerk to President, same road.

JOHN D. EVANS, M. Can. Soc. C.E., who has been appointed Division Engineer, Ottawa Division, Ontario Grand Division, Canadian Northern Ry., Trenton, was born in Goderich Tp., Ont., May 27, 1843, and was educated at private schools, the Toronto Grammar School, and Upper Canada College. In March, 1860, he was articled with a firm of land surveyors in Toronto and obtained his certificate as Provincial Land Surveyor in July, 1854. He practised as a land surveyor, civil engineer and architect at Belleville, Ont., until Feb., 1882, when he was appointed Chief Engineer, Central Ontario Ry., in charge of the survey and construction of the line from Trenton to Coe Hill, and on the completion of that work he was appointed Engineer of Maintenance of Way, which position he held until his present appointment.

N. R. DES BRISAY, who has been appointed General Travelling Passenger Agent, C.P.R., Montreal, was, from June 14, 1904, to May 31, 1905, clerk in District Passenger Agent's office, C.P.R., St. John, N.B.; June 1, 1905, to June 7, 1907, ticket clerk, City Ticket Office, St. John; June 14, 1907, to Dec. 5, 1908, ticket clerk, s.s. Empress of Ireland; Dec. 5, 1908, to May 24, 1909, exchange ticket agent, Halifax, N.S.; May 27 to Nov. 19, 1909, exchange ticket clerk, Quebec; Nov. 19, 1909, to May 4, 1910, exchange ticket clerk, Halifax, N.S.; May 5 to July 15, 1910, exchange agent, Quebec; July 15, 1910, to Nov., 1912, Travelling Passenger Agent, St. John; he resigned that position to enter private business for a short time, resuming his duties in the early part of 1913, and held the same position until his present appointment.

WILLIAM T. KUHN, whose appointment as Superintendent of Motive Power, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., was announced in our last issue, was born at East Radford, Va., in 1872. He was educated at the Radford public schools, and took a complete mechanical course with the International Correspondence Schools, Scranton, Pa. He entered railway service in 1888 as apprentice machinist, Norfolk and Western Ry., and until 1890 served as machinist, roundhouse foreman and assistant air brake instructor. In 1900 he was appointed roundhouse foreman, Lake Shore and Michigan Southern Ry., and was subsequently appointed Mechanical Inspector. In Mar., 1911, he was appointed Assistant Master Mechanic, Lake Erie and Western Rd., and in Oct., 1911, was appointed Master Mechanic, Toronto, Hamilton and Buffalo Ry.

HON. H. R. EMMERSON, M.P., who died at Dorchester, N.B., July 8, was born at Maugerville, N.S., Sept. 25, 1853, and became an attorney of the Supreme Court of New Brunswick in 1877. He entered the New Brunswick Legislature in 1888, was defeated in 1890, and became a member of the Legislative Council in 1891, and then advocated the abolition of that body, which

P288 H. Foster Chaffee,
Passenger Traffic Manager, Canada Steamship Lines, Ltd.

took effect in 1892. Prior to the abolition of the Legislative Council, he was appointed President of the Executive Council, and was Commissioner of Public Works in 1892, and from 1897 to Sept. 1900, was Premier of New Brunswick. He entered the House of Commons in 1900, and was, from 1904 to 1907, Minister of Railways and Canals. Probate of the will was granted at Dorchester, July 14, the estate being valued at about $100,000, and left to his family, with the exception of $5,000 to J. Frill, his solicitor and friend.

H. FOSTER CHAFFEE, Passenger Traffic Manager, Canada Steamship Lines, Ltd., Montreal, has resigned, effective Oct. 1, owing to the condition of his health necessitating a complete change of climate. Jas. Carruthers, President, in making the announcement recently, expressed regret at the retirement. Mr. Chaffee was born at Knowlton, Que., Dec. 18, 1868, and entered transportation service in 1883, since when he has been, to 1884, ticket clerk, South Eastern Ry., Montreal; 1884 to 1885, ticket clerk, C.P.R., Montreal; 1885 to 1895, City Passenger and Ticket Agent, Richelieu and Ontario Navigation Co., Montreal; 1895 to 1900, also in charge of the company's transfer books; 1900 to Feb., 1907, Western Passenger Agent, same company, Toronto; Feb., 1907, to June, 1912, Assistant General Passenger Agent, same company, Toronto; June, 1912, to Feb. 27, 1913, General Passenger Agent, same company, for lines west of Prescott, Ont.; Feb. 27, 1913, to the taking over of the various properties merged as Canada Steamship Lines Ltd., Passenger Traffic Manager, Richelieu and Ontario Navigation Co., Montreal.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414,500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	208,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
Jan.	1,570,900	1,218,000	352,900	82,700
Feb.	1,324,600	1,086,000	238,600	x29,900
Mar.	1,533,400	1,173,000	360,400	x71,100
Apr.	1,610,000	1,195,800	414,200	x88,900
May	1,641,600	1,160,000	481,600	x98,600
June	1,655,300	1,192,000	463,300	x79,200
	$22,700,700	$17,349,000	$6,351,700	$302,700
Incr.	.....	.....	$ 381,900	.....
Decr.	$ 279'100	$ 581,809	.....	.....

x Decrease.

The mileage operated at the end of June was 4,670, against 4,297 at the same period 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$11,993,062.27	$7,876,269.09	$4,116,793.18	x$331,383.72
Aug.	11,434,459.58	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,503.96	4,226,821.71	x168,897.80
Jan.	7,916,216.25	6,916,042.19	1,000,174.06	x662,199.72
Feb.	7,594,172.73	6,122,596.27	1,471,576.46	x1,048,492.88
Mar.	9,447,461.24	6,348,222.37	3,099,238.87	x756,178.02
Apr.	9,720,461.58	6,375,596.56	3,344,865.02	x600,212.53
May	9,795,928.94	6,832,917.24	2,963,011.70	x541,018.16
	$119,760,402.77	$80,670,099.99	$39,090,302.78	x$3,527,816.79
Decr.	$7,960,866.79	$ 4,433,050.00	$ 3,527,816.79	.....

x Decrease.

Approximate earnings for June, $9,561,000, against $11,187,000 for June, 1913. At the end of June the mileage under operation was increased to 12,039.

Grand Trunk Railway Earnings, Etc.

The following figures show the earnings of the G.T.R., C.A.R., G.T.W.R., and D.G.H. & M.R., from Jan. 1 to June 30, compared with those for the same period 1913:—

	1914	1913	Increase	Decrease
G.T.R.	$19,189,816	$21,218,907	.....	$2,029,091
C.A.R.	1,159,713	1,151,877	$ 7,836	.....
G.T.W.R.	3,453,634	3,642,809	.....	189,175
D.G.H. & M.R.	1,177,703	1,143,189	$34,514	.....
Totals	$24,980,866	$27,156,782	.....	$2,175,916

Grand Trunk Pacific Railway Earnings.

The approximate earnings for the Prairie Section and Lake Superior Branch, 1,104 miles, for June, was $427,104, against $504,063 for June, 1913. The aggregate earnings for six months ended June 30 were $2,482,512, against $2,659,678 for the same period 1913.

F. M. SPAIDAL, General Superintendent, Quebec Grand Division, Canadian Northern Ry., writes:—"I would like to say that Canadian Railway and Marine World is very much appreciated in this province and that each copy is looked forward to with a great deal of interest."

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—Tracklaying is reported to be in progress on this line, which starts from the Edmonton, Dunvegan and British Columbia Ry., near Sturgeon River, and as the grading is light and is being rapidly pushed forward, it is expected to have the steel laid to Lac la Biche by the end of the year. J. D. McArthur is President and general contractor. (July, pg. 323.)

Burrard Inlet Tunnel and Bridge Co.—After several meetings to consider the alternative plans and tenders for the building of a bridge across the Second Narrows of Burrard Inlet ,at Vancouver, B.C., the directors decided, July 7, to refer the whole matter to the British Columbia Government. The Premier stated, July 9, that the Government merely desired to be consulted before a definite decision was arrived at, and that it had no intention of taking the responsibility for letting the contract. This information was given the directors the same day, and at a meeting held July 11, it was decided to invite R. Mojeski, Chicago, Ill., one of the engineers who reported on the Quebec Bridge, to examine the three plans and report on them.

The B. C. Legislature has granted a subsidy of $400,000 in aid of construction. The plans and tenders under consideration were submitted by the Dominion Bridge Co., the Canadian Bridge Co., and by C. A. P. Turner in connection with the Western Foundation Co. and local steel manufacturers. The principal difficulty has arisen from the fact that the Vancouver Board of Trade and other interests have been bringing pressure to bear on the directors to give the contract to local firms. (July, pg. 323.)

Calgary and Fernie Ry.—The Board of Railway Commissioners has approved of location plans from mileage 40 out of Calgary, Alberta, to sec. 5, tp. 19, range 8, west of the 5th meridian, mileage 95. The Board has also approved of plans from lot 8493, Kananaskis Pass, southerly to lot 4135, 0.63 mile. The latter order reserves to the Board the right to have this piece of line operated by companies interested as a joint section. The line is projected to extend from Calgary through the Sarcee Indian reserve and the oil districts, along the valley of the south branch of the Sheep River, and through the Elbow and Kananaskis passes to Fernie, B.C. (July, pg. 323.)

Erie and Ontario Ry.—The Dominion Parliament, at its last session, incorporated a company with this title to build a railway from Port Maitland, on Lake Erie, Ont., to Smithville, on the T. H. & B. R., 21 miles from Hamilton, and also from Port Maitland to Port Colborne. The provisional directors were W. J. Aikens, of Dunnville; J. S. Hamilton, W. T. Henderson, Lloyd Harris and A. J. Wilkes, of Brantford. The authorized capital is $500,000, and the head office at Hamilton. This company was incorporated in the interest of the Toronto, Hamilton and Buffalo Ry., and a board has been elected as follows:—J. N. Beckley, President, Rochester, N.Y.; who is President, T.H. & B.R.; W. J. Aikens, Dunnville, Vice President; E. D. Cahill, Hamilton, Secretary, who is solicitor, T. H. & B. R.; W. T. Henderson, Lloyd Harris, Brantford; J. W. Eber, General Manager, T. H. & B. R.; and H. F. Backus, General Traffic Manager, T. H. & B. R. W. E. Hackett, Local Treasurer, T. H. & B. R., Detroit, Mich., has been appointed Treasurer, E. & O. R.

Surveys were made recently under the direction of R. L. Latham, Chief Engineer, T. H. & B. R., from Smithville to Dunnville, 15 miles, and the survey is now being made from Dunnville to Port Maitland, 4 miles. The line will pass Elco and Port Davidson, crossing the Michigan Central Rd. and the G. T. R. air line near Attercliffe. The maximum gradient, we are officially advised, will be 0.4%, and the maximum curvature 5 degrees. There will be no bridges of any consequence except the crossing of the Twenty Mile Creek at Smithville, the Welland River, Oswego Creek, and the Dunnville feeder. None of these will be large structures, but the last mentioned will be a draw span.

The Minister of Railways has approved of the route map from Smithville to Port Maitland, and the Board of Railway Commissioners has approved of location plans from Smithville to the northerly limit of Dunnville.

(See Toronto, Hamilton and Buffalo Ry., June, pg. 267, and July, pg. 324; and Erie and Ontario Ry., April, pg. 165.)

Edmonton, Dunvegan and British Columbia Ry.—The permanent steel bridge across the Athabasca River, at Smith, Alta., is reported to be practically completed. The work in hand on the line for this year is light, involving the handling of only 15,000 cubic yards of material a mile. It is expected to have track laid to Big Turkey River by the end of the year. (July, pg. 323.)

Esquimalt and Nanaimo Ry.—It was expected to open the extension of the line from McBride Jct. to Courtenay, Vancouver Island, for traffic, July 30. (July, pg. 323.)

Gananoque and Arnprior Ry.—The ratepayers of Gananoque, Ont., have voted $25,000 towards building this projected railway. (April, pg. 168.)

The Glengarry and Stormont Ry. is under construction from about a mile west of St. Polycarpe station, Que., on the C.P.R., Smiths Falls subdivision, to Cornwall, Ont., 28 miles. It will pass through St. Telesphore, Bridgend, and Williamstown. The contract for the construction complete is held by Glengarry Construction Co., Montreal, which has sublet portions, as already noted. A. A. Mellor, A. Can. Soc. C. E., is Chief Engineer.

Local reports state that work is being rapidly pushed ahead all along the line, a large proportion of the scraper work being completed. The concrete work on the bridge foundations was started July 9. The two most important structures are the bridges across the Beaudette River and the southern branch of the same in Stormont County, but neither are large bridges. It is expected to have grading completed so as to commence tracklaying in September. The station, etc., at Williamstown, the only point at which there will be buildings of any size, are being erected.

Copy of a trust deed securing an issue of $825,000 of 5% 30 year mortgage bonds has been filed with the Secretary of State at Ottawa. The deed is made between the company, the Royal Trust Co., and the C.P.R. The filing of this deed confirms the reports that the line is built in the C.P.R. interests. (July, pg. 323.)

Intercolonial Ry.—On a recent visit to Pictou, N.S., F. P. Gutelius, General Manager, is reported to have stated that soundings will soon be taken in connection with a project to build a bridge from Browns Point to Sylvester, as a part of the work of reducing gradients and getting a better line between Pictou and Westville. The building of a new bridge with connecting lines, it is claimed, would shorten the distance between Sydney, N.S., and Moncton, N.B., by 37 miles, besides enabling great improvements to be made in the harbor accommodation at Pictou. The matter will be fully discussed with the department at Ottawa as soon as the necessary information is obtained.

Negotiations for the elimination of level crossings in Moncton, N.B., have been resumed. A city council committee met Mr. Gutelius, July 13, and discussed several matters arising out of the proposals. It is said that practically all the points are agreed upon, and that another meeting, to be held in August, will probably close out the whole question.

Contracts for the erection of substructures for steel bridges at various points have been let as follows:—W. M. Leacy, Prescott, Ont.—District 1—Kamouraska bridge, $2,938; St. Jean Port Joli bridge, $4,326; crossing over N. T. R., $9,548; Black River bridge, $4,424. R. S. & J. H. Henderson, North Bay, Ont.—District 1—River Bras, St. Nicholas, $24,252; River du Sud bridge, $37,905. W. R. Fawcett, Temperance Vale, N.B.—District 2—Kouchibouguacis River, $7,182; Barnaby River, 2nd crossing bridge, $2,425; bridge ½ mile west Sayabec, $2,773; Black River bridge, $1,699. R. B. Stewart, Derby Junction, N.B.—District 4—French River bridge, $6,448; District 2—Barnaby River, 3rd crossing bridge, $11,288. McDonald & McIntosh, Antigonish, N.S.—District 4—Barney's River, east crossing bridge, $2,397; Barney's River, west crossing bridge, $2,959. (July, pg. 323.)

Kettle Valley Lines.—In a recent statement, J. J. Warren, President, is reported to have said that all the contracts for the uncompleted portions of this line between Midway and the Fraser River, B.C., have been let and the work is progressing at a good rate. Track has been laid on the 134 miles between Midway and Penticton, with the exception of about 12 miles, on which some bridge work is yet uncompleted. About 40 miles have been graded between Penticton and Osprey Lake and are ready for the steel; and grading is in progress on the 32 miles between Osprey Lake and Princeton. The line connects at Princeton with the Vancouver, Victoria and Eastern Ry., and will run over it to Otter Summit, from which point the K.V.R. has been completed to the Coquihalla Valley section, which is under construction by the K. V. R., to the Fraser River, at Hope. Over this Coquihalla section to V., V. and E. Ry. will have running rights. A branch extends from Otter Summit to Merritt, where connection is made with the C.P.R. Nicola Valley branch running from Spences Bridge. This branch is expected to be opened for traffic by Oct. 1. At Hope a bridge is under construction across the Fraser River, to give connection with the C.P.R., so that when the entire line is in operation it will be possible for the C.P.R., which has a lease of the K. V. Lines, to give a through connection from its Crowsnest Pass line with Vancouver, and to provide a new connection between the Pacific coast and various U.S. points. (July, pg. 323.)

Lake Erie and Northern Ry.—A special meeting of shareholders will be held at Montreal, Aug. 4, to pass resolutions leasing the line to the C.P.R.; cancelling a mortgage securing $500,000 of second mortgage bonds; authorize an issue of bonds in aid of construction, and enter into a necessary mortgage to secure any new issue of bonds authorized.

Construction is progressing. The section between Brantford and Galt is almost ready for operation. Considerable work is being done in Brantford, the principal portion of which is in the vicinity of the Lorne bridge,

where considerable alterations are required to give the line a right of way. There is a good deal of work yet to be done between Brantford and Waterford, owing to the fact that construction was held up on account of negotiations, which proved fruitless, being on for the use of the section of the Toronto, Hamilton and Buffalo Ry. between these points. The work on this section has been resumed, and rapid progress is being made with the grading and bridge work. The section between Waterford and Port Dover is nearly ready for tracklaying, but it is not expected that this will be started until the Brantford-Waterford section is completed.

U.S. press reports state that it is proposed to run a car ferry service to Port Dover in connection with the line, from Erie, Pa., and that negotiations are in progress with the Pennsylvania Rd. for water front and dock space. (July, pg. 323.)

New Brunswick Coal and Ry. Co.—Plans have been deposited with the Minister of Public Works showing temporary repairs and reinforcement to existing substructure at bridge 20.6, over the Washademoak River, N.B. A. Sherwood, Fredericton, N.B., is in local charge of this line, which is being operated by the C.P.R.

Pacific Great Eastern Ry.—J. W. Stewart, President, is reported to have stated recently that the line from North Vancouver to Fort George, B.C., is entirely under contract, and that such progress is being made with the grading that it is expected to have the grading completed from Squamish to Fort George and ready for tracklaying this year. It is further expected to have track laid from Squamish to Lillooet, 120 miles, this year.

The ocean terminals are to be laid out at Squamish, and the plans for the extensive works to be undertaken there are being prepared by J. Cumming. They include the changing of the courses of the various channels of the river, the filling up of a large area of low lying land, and the clearing of the Indian reserve.

A train service has been put in operation from North Vancouver to Horse Shoe Bay, 13 miles, and construction is in progress between that point and Squamish, 20 miles. It is not expected to complete this section until the end of 1915, the construction being heavy.

We are officially advised that the following sub contracts have been let on the line southerly from Fort George:—Fort George to mileage 29.5, H. E. Carleton & Co., Prince George; mileage 29.5 to Cotton wood Crossing, mileage 62, A. E. Griffin & Co., Prince George; mileage 62 to 10 miles south of Quesnel, 35 miles, Burns, Jordan & Co., Quesnel; 10 miles south of Quesnel to mile 15 south of Quesnel, 4.00 miles, H. McLeod, Quesnel; mileage 15 south of Quesnel to Four Mile Creek, 12.5 miles, Kullander & Smith, Quesnel; Four Mile Creek to mileage 40 south of Quesnel, 13.5 miles, Shoreby & Co., Soda Creek; mileage 40 south of Quesnel to Soda Creek, 8 miles, N. McLeod, Soda Creek; Soda Creek to Williams Lake, 17 miles, Stewart Bros., Soda Creek. We have already published the facts that subcontracts had been let to these firms, but the present information gives the names and addresses of all the subcontracts let south of Fort George, together with the mileages upon which each is working.

The Minister of Railways for British Columbia has approved of general location for this line now under construction from Ten Mile Lake to Soda Creek, Cariboo district, on the Vancouver-Fort George line; and from Azzuzetta Lake, Pine Pass, to the boundary between British Columbia and Alberta, on the line from Fort George, which is to connect with the Edmonton, Dunvegan and British Columbia Ry. at the provincial boundary line. (July, pg. 324.)

Pacific, Peace River and Athabasca Ry.—J. Anderson, with a party of engineers, has completed a survey of the route from Stewart to the Groundhog River mining district for the British Columbia Government, with a view of constructing a Government road. The present route to the river is via Hazelton, and reaches an elevation of 5,200 ft. The surveys show that a route 40 miles shorter, and reaching an elevation of only 3,200 ft., can be obtained from Stewart. A survey for a railway through this district is being made by the P., P. R. and A. Ry. (July, pg. 324.)

Prince Albert, Sask.—Press reports state that the Prince Albert Board of Trade has received a prospectus of the Great North Western Ry., which proposes to build a railway from that city to Athabasca Landing, Alta., and another easterly, either to connect with the Dominion Government railway to Hudson Bay, or direct to the Bay itself. The report suggests that the Board should, if it takes any action at all, advocate the building of a line from Prince Albert to a junction with the Dominion Government railway at Pas, Man.

Quebec Central Ry.—Press reports state that about five miles of grading have been completed on the extension of the line from St. Sabine to English Lake (also called Lac la Frontier), 26 miles, and that a second five miles will be completed this year. P. J. Wolfe, Sherbrooke, Que., is the contractor for the grading. J. T. Morkill, Chief Engineer. It is expected that the contract for the remaining 16 miles will be let in 1915.

A contract has been entered into with the Dominion Government, under the act granting aid for the construction of certain railways for the building of a line from St. Sabine parish, mileage 31.34 from St. George, to mileage 50, in the Devoire Tp., L'Islet County.

St. Francis Valley Ry.—This projected line will have a total length of 140 miles if built. It will extend from Sorel, via Drummondville, Melbourne and Magog, to the International Boundary near Stanstead, with a branch from Cherry Valley to Granby, Que. The only work yet done is the survey of a proposed route from Drummondville to Melbourne, 30 miles. The officers and directors are:—President, A. P. Frigon; Vice President, C. B. Hibbard; Treasurer, G. Gouthier; other directors: A. St. Cyr, Hon. F. L. Beique. (May, pg. 215.)

St. John and Quebec Ry.—Press reports state that track has been laid on 110 miles of line, and that a train service will be put in operation over a considerable mileage at once. This mileage is between Gagetown and Centreton, N.B. Other portions of the line are under construction, and a contract is reported let for the remaining mileage. The Dominion Government will build the three big bridges necessary to finally complete the line. The exact location of some small portions of the line will not be fixed until the sites for these bridges have been definitely agreed upon. (July, pg. 324.)

Skye Mountain Ry.—The Nova Scotia Legislature has incorporated a company with this title to build a railway in the Skye Mountain district of Inverness County. It is projected in connection with the opening up of some collieries in the vicinity of Orangedale.

Western Dominion Ry.—Press reports state that construction will be started early in August on this projected railway from Calgary, via the Old Man River valley, Pincher Creek and Cardston, to the International Boundary, in range 23 west of the 4th meridian, Alberta. The approximate quantities involved in the construction are:—Earth excavation, 3,636,069 cu. yds.; rock excavation, 106,501 cu. yds.; embankment, 3,568,980 cu. yds.; trestles, 5,490 lin. ft.; masonry, 19,830 cu. yds.; steel bridges, 5,530 lin. ft. J. N. H. Cornell, 29 Broadway, New York, N.Y., is Chief Engineer. (July, pg. 324.)

Winnipeg, Man.—At a recent meeting of the commissioners for the Greater Winnipeg water supply, it was reported that satisfactory progress was being made by the Northern Construction Co. with the building of the railway from St. Boniface to Shoal Lake, Man. The commissioners authorized the N. C. Co. to drain the wet area in the vicinity of the Brokenhead River, and to construct ditches in certain other areas, as extras to the general contract. Construction has been practically completed as far as range 7.

The Board of Railway Commissioners has authorized the physical connection of the line with the Canadian Northern Ry. at three points, and the making of a temporary connection at another point. (July, pg. 324.)

Toronto Terminal Railway and Union Station.

The contract for the erection of the station building has been let to the P. Lyall and Son Construction Co. at a cost of about $4,000,000. A full description and plans of the building were given in our June issue, pg. 262. The plans were prepared by Ross and Macdonald and H. G. Jones, Montreal, with M. Lyle, Toronto as associate architect. H. R. Safford, Chief Engineer of the G.T.R., and J. M. R. Fairbairn, Assistant Chief Engineer of the C.P.R., are consulting engineers for the T.T. Ry., and J. R. W. Ambrose is Chief Engineer.

Indications are that active work on the viaduct across the Toronto waterfront will soon be under way, as tenders have been invited for a temporary trestle for general construction work and filling on part of this work. The trestle will be of the 4 pile construction, single track, about 20 ft. above the existing grade, and will extend from Eastern Ave., on the east, to Church St., on the west, about 8,000 ft. There will be only one approach, at the Eastern Ave. end.

The Board of Railway Commissioners has approved of the location of the line of the T.T. Ry. from York St. to the Don River, mileage 1.50 to 3.26, and has authorized the expropriation of certain lands necessary for its purposes.

G.T. Pacific Ry. Hotel at Edmonton.—The latest of the hotels to be placed in operation by the company is the Macdonald Hotel at Edmonton, Alberta. It is located on McDougall St., near the crossing of Jasper Ave., and opposite the Edmonton Club, and there is a fine outlook over the Saskatchewan River valley. Louis Low, who was for some time at the Chateau Laurier Ottawa, and latterly Assistant Manager, Fort Garry Hotel, Winnipeg, has been appointed Manager.

The Canadian Ticket Agents' Association will hold its annual meeting in Chicago, Oct. 6 to 8. Many of the members are much disappointed at not being able to accept the invitation of a number of western U.S. lines to meet in San Francisco in October, owing to unexpected opposition which they encountered from the passenger management of their employing lines. It is stated that the C.P.R. passenger management subsequently withdrew its opposition.

Railway Finance, Meetings, Etc.

Algoma Central Terminal Co.—In connection with the recent failure of the Canadian Agency, Ltd., of London, Eng., which had been dealing with this company's bonds, and with the view of protecting the interests of the scrip holders, a committee has been formed in London, as follows,—Beckwith Smith, F. L. Govett, T. F. Lardelli and E. G. Ridpath.

The committee of scrip holders report that possession has been obtained of the majority of the total bond issue of $527,300, which have been lodged with the Bank of Montreal in London, Eng., for safe keeping, and hopes shortly to be in a position to make a statement regarding the balance.

Algoma Central Terminals, Ltd.—A London, Eng., cahlegram, July 23, says:—"The committee of scripholders of the Algoma Central Terminals, Ltd., have issued a circular announcing an agreement with the company regarding the honds which were undelivered owing to the Canadian Agency failure. The scripholders will, on the payment of 10% of the face value of the scrip, receive bonds for the full £100 duly stamped. The bonds were issued at 96, and thus 106 will be the real price. The other part of the loss of £127,300 remaining unpaid falls on the company, hut the latter assigns all its legal rights against the Canadian Agency to the trustee for the scripholders."

Canada Atlantic Ry.—A meeting of the shareholders was held at Ottawa, July 21, for the purpose of passing a resolution assenting to the provisions of the act passed last session of the Dominion Parliament authorizing the amalgamation of the C. A. Ry. with the G. T. R. The G. T. R. shareholders have already passed a resolution authorizing the amalgamation. With the passing of this resolution the C. A. R. as a separate company ceases to exist, and becomes finally merged in the G. T. R.

Canadian Northern Ry.—A cablegram from London, Eng., July 20, said:—"The underwriting is proceeding of an issue of $15,000,000 4% stock of the Canadian Northern Ry. The principal and interest are guaranteed by the Dominion Government. The stock is redeemahle in 1944, and the price is 94."

The issue referred to is £3,000,000 sterling of 4% debenture stock, to be issued under the authority of legislation passed at the Dominion Parliament's last session. It will be redeemahle in 1934, not 1944.

A London cahlegram of July 22 says Lazard Bros. are offering an issue of £3,000,000 at 94, it heing said that it is part of a total authorized issue of £9,246,576. The stock is unconditionally guaranteed, as to principal and interest, hy the Dominion Government.

Canadian Northern Ry.—The interest warrants on the 3½% first mortgage debenture stock of the C. N. R., C. N. Alberta Ry., and C. N. Ontario Ry., were paid July 20.

Grand Trunk Pacific Ry.—A meeting of shareholders was held in Montreal, July 21, for the purpose of approving of a mortgage deed securing the new issue of bonds to he made hy the company under the guarantee authorized by the Dominion Parliament. The amount of the guaranteed hond issue authorized is $16,000,000. The proceeds of this issue will he used to retire the $10,000,000 of one year notes recently issued by the G. T. R., to secure funds for the completion of the G. T. P. R., and for the provision of rolling stock, etc., for the line.

The following officers were elected directors to fill vacancies:—J. E. Dalrymple, Vice President, G. T. R. and G. T. P. R.; F. Scott, Treasurer, G. T. R. and G. T. P. R.; W. H. Ardley, General Auditor, G. T. R. and G. T. P. R.; H. R. Safford, Chief Engineer, G. T. R.

Grand Trunk Ry.—Recent press reports in the United States state that the G. T. R. is negotiating with the Chicago Great Western Ry. either to take it over entirely, or to operate it under lease. It was suhsequently stated in Montreal that there is no foundation for the reports as to the purchase.

An issue of $10,000,000 of one year hills is said to have heen placed on the London, Eng., market, on the hasis of 4¾%. The money is required for the completion of the main line and hranches of the G. T. Pacific Ry., at present under construction.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—At the annual meeting of the shareholders in Minneapolis, Minn., Sept. 15, a proposal will be suhmitted to increase the capital stock from $42,000,000 to $63,000,000, retaining the same ratio of preferred and common stock as now exists.

North Shore Ry.—The Beersville Coal and Ry. Co. was incorporated hy the New Brunswick Legislature in 1904, and a railway was suhsequently huilt connecting the collieries at Beersville with the Intercolonial Ry. at Adamsville, N. B. The line was sold under a writ of fi. fa in 1907, and the purchasers were incorporated under the New Brunswick Companies Act as the North Shore Ry. The original owner, the Imperial Coal Co., has ceased to exist, and a new company has heen formed to take over and operate the coal properties at Beersville, with the title of the Thompson Coal and Brick Co. The railway has not heen operated for some time, and in order to provide railway accommodation for the district, the Legislature passed an act authorizing the Government to appoint some one to take charge of the railway and operate it for the public benefit. The act provides that after payment of operating expenses any surplus shall belong to the N. S. Ry. Co., hut that if there is a deficit it shall become a first charge on the railway and rolling stock. The Thompson Coal and Brick Co. undertakes to efficiently and continuously operate its colliery, to provide traffic, under pain of forfeiture of its leases. The holders of any securities issued hy the railway company, valid at the time of passing this act, shall he entitled to full henefit of the same, suhject to the lien created by the present act.

Pacific Great Eastern Ry.—The Yorkshire Guarantee and Securities Corporation is offering, in England, $300,000 6% debentures of the Howe Sound and Northern Development Co., Ltd., secured by the assignment of moneys, to the Guarantee Co., which acts as trustee for the debenture holders, due under an agreement of sale between the Howe Sound and Northern Development Co. and the Pacific Great Eastern Ry.

Pere Marquette Rd.—The U. S. Court at Detroit, Mich., has authorized the receivers to issue $2,000,000 receiver's certificates, with prior lien to divisional mortgages, and $2,000,000 prior to system mortgages hut junior to divisional mortgages. The court stated that certificates used to pay taxes would rank ahead of all other obligations and therefore he marketahle at once. The amount needed for taxes, including interest and penalties, is $1,718,000 while other claims to be cared for total another $2,000,000. The divisional bondholders have entered an appeal, objecting to the unpaid taxes heing placed ahead of their claims. The court indicated its determination to sell the system with the least possihle delay, probably in October, when the work of appraisal will be complete.

Temiscouata Ry.—Net earnings for April, $13,871; aggregate from July 1 to Apr. 30, $50,555.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to June 21, $326,094, against $309,899 for the same period, 1913.

White Pass and Yukon Route.—Interest on the 5% consolidated first mortgage debenture stock, was paid on July 1, and also interest coupon 27, on the 6% debentures.

Grand Trunk Railway Betterments, Construction, Etc.

Montreal Track Elevation.—The city railway engineer, G. R. McLeod, is preparing a special report on the elevation of the G.T.R. tracks hetween Bonaventure station and St. Henri, Montreal, for consideration at a conference hetween the city engineer, the G.T.R. engineer, and the Chief Engineer of the Board of Railway Commissioners, Aug. 29.

St. Lambert Yards.—The work on the extension of the yards at St. Lamhert, near Montreal, which has been in progress for ahout three years, is reported completed. The yard is auxiliary to that at Point St. Charles, hut is, at the same time, self contained and distinct. There are included in the general scheme a new locomotive house with 18 stalls; storage tracks which proceed as far as St. Huhert, a distance of six miles, east and west receiving and distrihuting tracks, electric interlocking devices, operative over the whole yard, hlock signals, semaphores—a most complex network of trackage and dovetailing lines crisscrossing over a wide area; and a railway Y.M.C.A. The trackage can he extended beyond St. Huhert should the demand arise for increased accommodation. The total cost of the work is said to have been $1,000,000.

Tweed Yard.—The extension work at the Tweed yards, near Montreal, is being proceeded with, hut considerable work will have to he done before it is completed.

The laying out of this yard and that at St. Lamhert were necessary in order to relieve the congestion at the Point St. Charles yard, and formed a portion of the whole scheme of terminal improvements at Montreal, part of which, including the track elevation and the erection of a new station at Bonaventure, is still under consideration.

Detroit, Mich.—Press reports state that the G.T.R. is considering plans for the erection of a new station in Detroit, Mich., to replace the present Brush St. station. (June, pg. 253.)

A Canadian Northern Ontario Ry. Arbitration.—The Imperial Privy Council has given its decision in the appeal of the old James Bay Ry., now C. N. Ontario Ry., against the arhitration awards in respect of the value of the land of R. Davies, of the Don Valley hrickyards, Toronto, taken for railway purposes. The proceedings were started in 1905, the company first offering $3,000 and finally $15,000 for the land. Mr. Davies claimed that the shale should be paid for at the value to him for his brick yards. The arbitrators put the value at $230,820, hut the Court of Appeal reduced this to $110,000 on the ground that the railway ought not to he made to pay for the shale until the hrickyard was ready to develop it. When first argued in the Privy Council the court disagreed, hut on the present occasion they decided that the railway company should pay the larger sum with 5% interest.

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TORONTO, CANADA, AUGUST, 1914.

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Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Freight Rates West of Port Arthur.

General Order, 125. May 30. Re complaint of Vancouver Board of Trade, alleging discrimination in freight rates by railway companies operating in British Columbia; and the consideration of the matter of rates for the carriage of freight traffic upon railway lines in Canada west of Port Arthur, Ont. Upon the hearing of the matter at various sittings of the board, held in the presence of counsel for, and representatives of, the railway companies affected, the Dominion Government, the Governments of Saskatchewan, Alberta and British Columbia, the City of Winnipeg and the Winnipeg Board of Trade, the City of St. Boniface and the St. Boniface Board of Trade, the United Farmers of Alberta, the Canadian Manufacturers' Association, and the Boards of Trade of Montreal, Toronto, Portage la Prairie, Brandon, Regina, Moose Jaw, Saskatoon, Prince Albert, North Battleford, Edmonton, Medicine Hat, Calgary, Lethbridge, Nelson, Vancouver and Victoria, the evidence adduced, and what was alleged, judgment, dated April 6, 1914, was delivered by the Chief Commissioner, and concurred in by the other members of the Board, a certified copy of the said judgment being attached hereto marked "A." It is ordered that the terms of the judgment, which is hereby made part of this order, and the tariff changes therein directed to be made, be complied with and become effective not later than Sept. 1, 1914. And it is further ordered that, for two years from the date of this order, no rates at present in effect west of Port Arthur, Ont., be increased without the approval of the Board.

Lumber Rates to Montreal For Export.

21869. May 19. Re application of R. Cox & Co., complaining that the rate charged by the C.P.R. on lumber from Routhier, Que., to Montreal, for export, was excessive and discriminatory; and order 14964, Sept. 19, 1911. Upon the hearing of the complaint against the proposed increased rates on lumber to Montreal, for export, in Ottawa, April 21, in the presence of counsel for the C.P.R. and the representative of the Montreal Lumbermen's Association, and what was alleged. It is ordered that order 14964 be rescinded.

Paper Rates From Sault Ste. Marie.

21870. May 26. Re application of Lake Superior Paper Co. of Sault Ste. Marie, Ont., for an order suspending Duluth, South Shore and Atlantic Ry.'s Joint Commodity Tariff C.R.C. no. 331, filed to become effective June 1, 1914, applying on newsprint paper, in carloads, from Sault Ste. Marie, Ont., to points in the United States, the said tariff omitting the Algoma Central and Hudson Bay Ry. as party thereto. It is ordered that the said tariff be suspended, pending a hearing to be held at Ottawa on June 16, 1914, when the Duluth, South Shore and Atlantic Ry. and the C.P.R. will be required to show cause why the said tariff should not be disallowed.

Fruit Rates From Prince Edward County.

21877. May 26. Re complaint of Board of Trade of Picton, Ont., that the joint rates charged by the Canadian Northern Express Co. on fruit from Prince Edward County points, are excessive, compared with the rates on similar traffic from the Niagara district to points to which distance favors the complainant; also alleging defective transfer services for fruit and delays thereto at Trenton Jct. It is ordered that the Canadian Northern Express Co. be directed forthwith to file joint tariffs showing express rates on fruit and vegetables from the company's shipping points in Prince Edward County to points beyond or via Smiths Falls, reached jointly by the said company and the Canadian Express Co. or Dominion Express Co., that shall not exceed the rates on the said commodities published by the Canadian Express Co. and the Dominion Express Co. from the Niagara district to the same points.

Commutation Tickets Denied Lachute.

21889. May 27. Re complaint of Mrs. K. S. Massiah, of Lachute, Que., alleging discrimination by the C.P.R. against Lachute in issuing commutation tickets to St. Agathe, Vaudreuil, Hudson and other points. Upon hearing the complaint at Ottawa, April 21, 1914, in the presence of counsel for the C.P.R. and a representative of the Board of Trade of Lachute, the complainant appearing in person, and what was alleged. It is ordered that the complaint be dismissed.

Coke Rates in Toronto.

21956. June 8. Re complaint of Consumers' Gas Company of Toronto against rates charged by railways on shipments of coke within the Toronto group of terminals. It is ordered that the joint rate on coke, in carloads of a minimum weight of 40,000 lbs. a car, from the complainant's siding, on the Esplanade in Toronto, to the C.P.R. sidings at North Toronto, be reduced from 95 cents to 60 cents a ton of 2,000 lbs., to be made effective not later than June 22, 1914.

Rates on Heating and Ventilating Apparatus.

21969. June 11. Re applications of Sheldons, Limited, of Galt, Ont., and the Sirocco Co., Windsor, Ont., for an order reducing the carload rating of heating and ventilating apparatus in Canadian Freight Classification from 5th to 6th class: It is ordered that the applications be dismissed. That item 38, page 65, of Canadian Freight Classification 16 be amended by adding "air sprayers or washers," and "engines or motors," and by making the words "heater casings" read "heater or washer casings," and that to item 42, page 109, be added the words "for ventilating or induced draught purposes." That the amendments herein provided for be included in Supplement 4 to Canadian Freight Classification 16.

Cordwood Rates to Winnipeg.

22088. May 26. Re complaint of J. Thomas, of Winnipeg, of alleged excessive charges on cordwood from Richan, Ont., to Winnipeg, and the application for a rebate of at least $7 a car on 435 cars of cordwood. Upon hearing the complaint at Winnipeg in the presence of the complainant and counsel for the Grand Trunk Pacific Ry., and upon the report of the Chief Traffic Officer of the Board, it is ordered that the complaint be dismissed.

Sand and Gravel Rates.

22103, July 2. Re application of Manitoba Sand and Gravel Co., Winnipeg, for an order directing the Grand Trunk Pacific Ry. to amend its Special Freight Tariff C.R.C. 279, dated Nov. 21, 1912, as to item 10 on page 5, so as to provide an equitable rate on sand and gravel from Vivian station, Man., to Winnipeg. Upon hearing the application at Winnipeg, June 26, in the presence of counsel for the G.T.P.R., the applicant being also represented, it is ordered that the application be dismissed.

The Manitoba Government is reported to have renewed the lease of its elevators to the Grain Growers' Grain Co. The contract under which the company operates the Government elevators expires Aug. 31.

Canadian Northern Railway Construction, Betterments, Etc.

The new trust deed, provided for by the act passed last session of the Dominion Parliament, securing the $45,000,000 of securities to be guaranteed by the Dominion, was signed at Ottawa, July 15. The Department of Finance issued a statement, July 16, setting forth that all the requirements called for by the act had been complied with, the various agreements made, and the several stocks transferred, in accordance with the various provisions of the act. The trustees are the National Trust Co., Toronto, and the British Empire Trust Co., London, Eng. The amount of securities to be issued at any one time is subject to the approval of the Minister of Finance.

Canadian Northern Quebec Ry.—Press reports state that the company is negotiating for the purchase of several properties in the Jacques Cartier and Maisonneuve districts of Montreal, in order to extend and improve its lines and yard accommodation.

Mount Royal Tunnel and Terminal Co.—The lease of the company's property has been filed with the Secretary of State at Ottawa, as required by subsection 3, section 1, chap. 78, or the statutes of 1914.

The work on the tunnel is progressing rapidly and it is expected that it will be possible to have trains running through it by May, 1915. The plans for the lines in Montreal call for a viaduct 1,600 yards long from the tunnel portal to the waterfront, where there will be a yard for light and perishable freight, with tracks connecting with the Harbor Commissioners' lines. A temporary station on Lagauchetiere St. will, it is said, be built at once. When the big station on Dorchester is built, this temporary station will be utilized for express and other offices. The main yards will be located on the Back River, where the electric transfer yard will also be situated. There will also be a delivery yard at Mount Royal, and an elevated yard in the commercial part of Montreal.

Canadian Northern Ontario Ry.—The Board of Railway Commissioners has authorized the C.N.O.R. to make a connection with the G.T.R. at Ottawa. The line between Ottawa and Toronto has been opened for traffic, and also the portion of the Montreal-Ottawa-Port Arthur line from the junction with the line from Toronto, this latter being operated as a through line from Toronto to Edmonton.

The Board of Railway Commissioners has approved location plans of the proposed entrance into Toronto, mileage 251.84 to 253.73, Queen St. East.

A press report states that work has been started in Hamilton, removing the 300 houses from the right of way in that city acquired for building the line from Toronto to Niagara. Some of the houses have been sold for removal, while others will be demolished. Press reports state that other arrangements are being made with a view of an early start on construction on the line. Another press dispatch from Hamilton to the Toronto Globe, July, 23, says that the city has been notified that the C.N.R. has ordered Ewan Mackenzie to at once start work on the Toronto-Niagara line, that Mr. Mackenzie has taken in considerable plant and that work will be started on either side of Hamilton. We are officially advised that there is no foundation whatever for these reports, and we have every reason to believe that no work will be done on the Toronto-Niagara line this year.

Canadian Northern Ry.—About 100 ft. of the C.N.R. steel dock at Port Arthur, Ont., collapsed July 4, doing damage estimated at $23,000. The accident was caused by the heavy load of steel rails which had been stored on the dock. The rails are being recovered from the water, and pending reconstruction of the dock they are being unloaded from steamships direct into cars.

An agreement has been entered into with Port Arthur, by which the city gets possession of no. 5 dock and the company obtains possession of a number of street ends at the water side. The company will build a spur line to no. 5 dock.

The 300 ft. timber bridge at Bare Creek, about 20 miles west of Port Arthur, was burned June 28. Pending reconstruction, trains are run to the bank of the creek and connection is made by a gasoline launch.

Work was reported to have been started on the Deloraine, Man., branch line, July 15.

It is reported that the branch from Canora to Sturgis, 22 miles, will be completed and put in operation this year.

An arrangement was reported to have been completed, July 14, with the C.P.R., by which the latter grants a right of way over a piece of land at Bienfait, Sask., which will enable the completion of the line into Estevan. The construction of the branch has been held up for two years.

A press report states that the company's programme includes the grading for the Hanna-Medicine Hat line, and a line from Alsask, on the Saskatoon-Calgary line, through Empress, to a point on the Hanna-Medicine Hat line.

A press report states that an arrangement is under consideration by which the C.N.R. will secure running rights over the C.P.R. high level bridge between Strathcona and Edmonton in exchange for running rights by the C.P.R. over the C.N.R. Camrose-Edmonton line.

Canadian Northern Pacific Ry.—Steel rails are being delivered in large quantities at Port Mann and are being rushed forward. About 35,000 tons are said to be on the way, either overland to the Yellowhead Pass, or to Port Mann. Grading is practically completed right through, and the bridge building is being pushed ahead as fast as possible. As soon as sufficient quantities of rails have been got forward, tracklaying will be rushed from several points.

In connection with the Vancouver terminals, it is said that general consideration will be given to the whole matter during Sir Donald Mann's forthcoming visit to the West.

We are officially informed that there is nothing definite at present arranged in the way of establishing a car ferry service between the mainland and Vancouver Island. Press reports stated that this ferry connection would be made from Woodwards Landing, near Steveston, the island landing being at Patricia Bay.

Vancouver Island.—Steel rails for about 120 miles of line are being delivered, and as grading has been practically completed from Victoria to Patricia Bay and to Alberni, tracklaying can be pushed ahead.

The Minister of Railways for British Columbia has approved of the general location of a branch line from mileage 222.06 on the main line from Victoria to Duncan Bay, Sayword District, Vancouver Island, 8.2 miles. (July, pg. 322.)

Railway Mileage of the World.—A compilation of the world's railway mileage for 1912 shows a total of 670,997. The country with the largest mileage is the United States, which has 249,789 miles. Other countries having railway mileage of over 20,000, are as follows:—Russia, 49,419; Germany, 38,950; France, 34,200; India, 33,400; Austria-Hungary, 28,400; Canada, 26,700; Great Britain, 23,400; Argentina, 20,600.

Great Northern Railway Lines in Canada.

Midland Ry. of Manitoba.—An order has been made by the Manitoba Public Utilities Commission for the building of a spur track near Sherbrooke St., between Ross and Elgin Avenues, Winnipeg, at the company's cost. The building of this line was one of the conditions upon which the city agreed to permit the laying out of the company's terminals. Owing to its failure to do the work the city applied for an order to compel the company to carry out its agreement.

Vancouver, Victoria and Eastern Ry.—A. H. Hogeland, Chief Engineer, G.N. Ry., recently completed a visit of inspection over the sections of the line under construction. These include the sections to be jointly used with the Kettle Valley Lines, one of which is owned by this company, and the other by the K. V. L.

Arrangements are being made for the erection of the new station near the New Westminster end of the Fraser River bridge. A lease for the station site is being secured from the B. C. Government.

Vancouver Terminals.—The bridge at Broadway, Vancouver, has been opened for traffic. It is 288 ft. long and 70 ft. wide, and is fitted with car tracks, in anticipation of the extension across it of the British Columbia Electric Ry. lines. The erection of the bridge eliminates a level crossing.

Construction of the viaduct over the Grandview cut at Victoria Drive is also being proceeded with. These two bridges form part of the works undertaken by the company in rearranging and extending its lines in Vancouver, necessitated by the laying out of the new terminals at False Creek. J. M. Gruber, Vice President G. N. R., and other officers, paid a visit to Vancouver, July 10, and looked over the work in progress. He is reported to have said that the company's plans for the development of the reclaimed area, beyond that now in hand, had not been definitely decided. (June, pg. 269.)

Statement of Financial Position of Canadian Pacific Railway.

Sir Thos. G. Shaughnessy, President, issued the following statement, July 15:—"After the payment of all fixed charges and dividends, the company entered upon the new fiscal year, July 1, with $36,000,000 in cash, and $14,000,000 in equipment securities, after having spent upwards of $30,000,000 on railway and steamship construction, for which 4% consolidated debenture stock had been authorized, but not offered on the market. The end has nearly been reached with all the important works of construction and improvements that were in progress, and only a comparatively small portion of the money in hand will be required for their completion. No new works of any magnitude are contemplated at present, and, therefore, no necessity exists for a further issue of capital stock. It is not unlikely, however, that the directors will, at the meeting in October, recommend to the shareholders that the authorized ordinary share capital be made to conform to the amount for which the company has legal warrant, so as to provide for the company's future capital requirements as and when they arise."

C.P.R. and Austria.—A cable dispatch from Vienna, July 12, states that the Austrian Government has withdrawn the prohibition against the C.P.R. in regard to carrying on an emigration business in that country, and its agencies are now free to resume business.

Canadian Pacific Railway Construction, Betterments, Etc.

Atlantic Division.—We are officially advised that there is no foundation for the press report that plans have been prepared by the company for a new steel bridge across the river at St. John, N.B.

Application is being made to the Department of Public Works for permission to build a wharf in the St. Croix River at St. Stephen, N.B. Plans have been deposited with the Registrar of Deeds for Charlotte County, N.B.

Montreal Terminals.—The three large entrances to the general offices and station at Windsor St. have been completed and are being used. The first leads directly to the elevators, the second to the general waiting rooms, and the third to the concourse. A number of the offices in the older part of the building are being remodelled; the floors in the corridors are being relaid with mosaic, and a good deal of other work is being done to make it correspond with the new section.

The Westmount City Council has under consideration a proposal to grant the C.P.R. a strip of land 86 ft. wide at one end, and running out to nothing at the other, containing altogether 495 sq. ft., for railway extension in the vicinity of Prospect Ave. Some citizens are opposing this, and a delegation was notified, July 1, that no definite action would be taken without consulting them.

Campbellford, Lake Ontario and Western Ry.—This new line from Glen Tay to Agincourt, 183.42 miles, was opened for traffic, June 29. Trains are operated over it between Ottawa and Toronto, making connection at Smiths Falls with trains from and to Montreal, and at Parham Jct. with trains from and to Kingston, and local trains between Belleville and Toronto. The distance between Montreal and Toronto by the new line is 340.42 miles, or about two miles longer than by the original route.

Ontario Division.—A press report states that in connection with the completion of the Lake Erie and Northern Ry., it is expected that a union station will be built in Galt. The L. E. and N. R. is being leased to the C.P.R., and G. Bernhardt is reported to have said the C.P.R. was in treaty with him for the Iroquois Hotel site on Main St. for station purposes. Local people desire that the G.T.R. should co-operate with the C.P.R. in building a union station.

Manitoba Division.—The new yards at North Transcona, north east of Winnipeg, have been formally opened. A special official train was run from Winnipeg to Bergen, and thence over the cutoff to the new yards. Two of the new elevated tracks at Winnipeg station have been opened for traffic, and work is being proceeded with in elevating another pair of tracks. The new tracks are about 6 ft. higher than the old ones.

Saskatchewan Division.—The Board of Railway Commissioners has authorized the opening for traffic of the second track from mileage 1 to 12 on the Moose Jaw subdivision.

It is expected that the line now terminating at Expanse will be extended to Assiniboine, 16 miles, at an early date. Grading has been completed for some distance beyond Expanse.

Alberta Division.—Work has been started at Foremost, Alberta, by G. Webster's grading outfit on a 25 mile section of the line easterly, to connect with the section running westerly from Weyburn.

It is expected that the line connecting Kerrobert and Monitor will be completed at an early date. Tracklaying is nearly completed, and the telegraph line is under construction. This is a stretch of 70 miles of line, and when completed will enable trains to be run through from Moose Jaw to Lacombe, Alta.

The buildings being erected at Empress by C. W. Sharp and Son, contractors, Winnipeg, are:—Passenger station, 26 by 100 ft.; 10 stall locomotive house, and coaling plant.

The Board of Railway Commisisoners has authorized the opening for traffic of the branch from Gleichen to Shepard, Alberta, 40.64 miles.

British Columbia Division.—The Board of Railway Commissioners has authorized the opening for traffic of the Port Moody, B.C., branch, 3.24 miles.

The staffs of the various offices have moved to their new quarters in the new station building at Vancouver, and a start will be made, Aug. 1, in demolishing the old building. (July, pg. 319.)

Dominion Government Railway to Hudson Bay.

Steel is reported to have been laid to mileage 150 north east of Pas, Man. Work is in progress on the erection of the 480 ft. steel bridge across the Nelson River, at the Manitou Rapids. It is expected that this point will be made the junction at which other lines will join, as there are large areas of good agricultural land, stretching away for miles on both sides of the line. Grading is being pushed ahead in the direction of Port Nelson, and it is expected that a further stretch of 200 miles will be laid with steel by the end of this year. (July, pg. 320.)

W. A. Bowden, Chief Engineer, Railways Department, Ottawa, was announced to sail from Halifax, N.S., July 20, for Port Nelson, to inspect the H.B.R. terminal works.

Railway Rolling Stock Notes.

The Pacific Great Eastern Ry. has received one consolidation locomotive from Canadian Locomotive Co.

Canadian Explosives, Ltd., has ordered 2 all steel two way dump cars, 70 cu. ft. capacity, from Canadian Car and Foundry Co.

The Pacific Great Eastern Ry. has ordered 40 steel underframe flat cars, 40 tons capacity, from Canadian Car and Foundry Co.

The Canadian Northern Ry. has ordered 8 steel passenger cars, for the Mount Royal tunnel service at Montreal, from the Pressed Steel Car Co.

The Canadian Northern Ry., between June 14 and July 13, received 3 consolidation locomotives from Canadian Allis-Chalmers Ltd., and 20 colonist cars from Canadian Car and Foundry Co.

The Intercolonial Ry. has received 12 express refrigerator cars, 60,000 lbs. capacity, from its Moncton shops; 68 box cars, 80,000 lbs. capacity, from Nova Scotia Car Works, and 3 switching locomotives from Canadian Locomotive Co.

The C.P.R., between June 15 and July 15, received the following additions to rolling stock from its Angus shops:—120 steel frame box cars, 11 steel colonist cars, 128 stock cars, 1 class G2 locomotive, and 7 class G1 locomotives.

The Intercolonial Railway's four 75 ton pit cars, which have been ordered from the Eastern Car Co., as previously stated in Canadian Railway and Marine World, will be exactly the same as the C.P.R. pit cars which are very fully described and illustrated on page 353 of this issue.

The C.P.R., between June 15 and July 15, ordered rolling stock as follows:—2 freight refrigerator cars, 3 flat cars, 2 mail cars, 53 steel frame box cars, and 6 stock cars, from its Angus shops; and 20 steel ore cars, 50 tons capacity, from National Steel Car Co.

The Canadian Car and Foundry Co. shipped the following rolling stock during June:—To the G.T.R., 1 steel frame suburban car; to Intercolonial Ry., 100 steel frame box cars, 40 tons capacity; and to J. D. McArthur Co., 50 all wood flat cars, 30 tons capacity.

Canadian Northern Ry. Orders.

The C.N.R. has, as foreshadowed in our July issue, ordered passenger train cars for service on its Toronto-Ottawa line, which is already operating a day passenger service and freight service, and which will have a fast night service put on before the next parliamentary session, and also for its line from north of Sudbury to Port Arthur, which will have a through passenger service put on about Dec. 1. The orders, which are for 66 cars, have been given as follows:—Canadian Car and Foundry Co., 11 standard sleeping, 2 compartment sleeping, 7 compartment sleeping and observation, 7 dining, 7 tourist; Crossen Car Co., 7 colonist; National Steel Car Co., 5 first class, 15 baggage and express; Preston Car and Coach Co., 5 mail.

The cars will be 72½ ft. long, with 6 wheel trucks, steel underframes, steel ends and platforms, and electric lighting. The steel underframes will have self supporting side frames, cantilevered to transmit the entire half load to each bolster. The centre sills will be of the channel type, designed to resist 400,000 lbs. compression end load. The vestibules, entirely of steel, will be of C.N.R. standard design, with the end frame incorporating an anti-telescoping device of Z bar construction. The underframe finish will be the same as on the wooden equipment. The roof frame will be the same as on the wooden equipment, except for the mail cars, which will have pressed steel carlines in the roof. The flooring will be of cement, laid on steel sectional chanarch flooring, no. 22 B.w.g. The 6 wheel trucks will be of the all metal type, with cast steel centre plate support, and will be 80,000 lbs. capacity. The lighting will be provided through an axle generator, with a storage battery, and the heating will be by hot water circulation, except in the mail and baggage cars, which will have straight steam. The plans and specifications have been prepared under the direction of A. L. Graburn, Mechanical Engineer, C.N.R., and most of the draughting has been done in Montreal by the Canadian Car and Foundry Co.'s draughting force, the services of the principal portion of which were chartered by the C.N.R. for a limited period.

Montreal Contracting Co., Ltd., has been incorporated under the Dominion Companies Act, with $10,000 capital and office at Montreal, to act as general contractors for the construction of highways, railways, tramways, stations, bridges, wharves, docks, etc. The incorporators are, J. A. Ewing, G. S. McFadden, J. W. Brown, A. Steele and E. L. Earl, Montreal.

The Winnipeg City Council recently authorized the payment to the Canadian Locomotive Co. of $10,145.60 for a locomotive just delivered, and on the same day the locomotive broke through a wooden bridge across the Winnipeg River, causing the death of the driver, and at present it remains in the bed of the river.

The C.P.R. pays $6,000,000 in wages on the 15th of each month, about 120,000 cheques being issued.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Boston and Maine Rd.—JAMES H. HUSTIS, President, New York, New Haven and Hartford Rd., New Haven, Conn., has also been elected President, B. & M. Rd., vice M. McDonald, who resigned in February.

Canada Steamship Lines, Ltd.—J. E. DALRYMPLE, Vice President, G.T.R. and G. T. Pacific Ry., has been elected a director, Canada Steamship Lines Ltd., representing G.T.R. interests, vice W. Wainwright, deceased; and G. H. SMITHERS, Montreal, has been elected a director to fill a vacancy which has existed since the formation of the company.

Canadian Northern Ry.—D. CROMBIE, heretofore Inspector of Transportation, has been appointed Superintendent of Transportation, Eastern Lines, with jurisdiction over transportation matters.

THOMAS TURNBULL has been appointed Assistant Chief Engineer. Office, Winnipeg.

QUEBEC GRAND DIVISION.—F. M. SPAIDAL, heretofore General Superintendent, C. N. Quebec Ry. and Quebec and Lake St. John Ry., who has been appointed General Superintendent, Quebec Grand Division, has issued a circular stating that for the purposes of operation the Canadian Northern Quebec Ry. and the Quebec and Lake St. John Ry. have been designated the Quebec Grand Division, the former being called the Quebec Division, and the latter the Lake St. John Division, with a superintendent in charge of each of the two divisions. The superintendents are responsible for the condition and maintenance of the roadbed, tracks, bridges, stations, buildings, yards and other property on their respective divisions, and for the safe and economical movement of trains thereon, and for the enforcement of all rules and regulations applying thereto, and for the proper management of station service and discipline of men employed under them.

C. H. N. CONNELL, heretofore Engineer Maintenance of Way, C.N.Q.R. and Q. & L. St. J. R., has been appointed Engineer Maintenance of Way, in charge of the Maintenance of Way Department and buildings, reporting to the General Superintendent. Office, Montreal.

W. R. BOON, heretofore Bridge and Building Master, C.N.Q.R., has been appointed Supervisor of Bridges and Buildings, in charge of maintenance of bridges, trestles, culverts, station and other buildings, scales, water service and employes engaged therein, reporting to the Engineer Maintenance of Way. Office, Joliette.

T. C. HUDSON, heretofore Master Mechanic, C.N.Q.R. and Q. & L. St. J. R., has been appointed Division Master Mechanic, in charge of the maintenance of locomotive equipment and appurtenances, including shops and locomotive terminals, reporting to the General Superintendent. Office, Joliette.

H. J. WHITE, heretofore General Car Foreman, C.N.Q.R., has been appointed General Foreman, Car Department, in charge of the maintenance of car equipment and appurtenances, including shops used for the purpose, reporting to the General Superintendent. Office, Joliette.

H. P. TRACY, heretofore General Storekeeper, C.N.Q.R. and Q. & L. St. J. R., has been appointed Division Storekeeper, in charge of all materials and supplies, reporting to the General Superintendent. Office, Limoilou.

QUEBEC DIVISION.—J. J. SUNDERLAND, heretofore Superintendent, C.N.Q.R., has been appointed Superintendent, in charge of transportation and maintenance of way departments. Office, Joliette.

JOHN FAGIN, heretofore Trainmaster, C.N.Q.R., has been appointed Trainmaster, in charge of all matters relating to the safe and economical movement of trains and station service, and men employed therein, reporting to the Superintendent. Office, Joliette.

R. J. MUNROE, heretofore Roadmaster, C.N.Q.R., Joliette, has been appointed Roadmaster, in charge of all matters relating to the maintenance of way, including roadbed, track, right of way and other property, and men employed in that department, reporting to the Superintendent. Office, Joliette.

B. C. HASKINS, heretofore Roadmaster, C.N.Q.R., Limoilou Jct., has been appointed Supervisor of Track, in charge of maintenance of track, roadbed and right of way and employes engaged thereon, with jurisdiction east of Joliette, reporting to the Roadmaster. Office, Limoilou.

ALEX. DEWAR, heretofore Road Foreman, C.N.Q.R., St. Jerome, has been appointed Supervisor of Track, in charge of maintenance of track, roadbed and right of way, and employes engaged thereon, with jurisdiction west of Joliette, reporting to the Roadmaster. Office, Limoilou.

JOHN KERR has been appointed Road Foreman of Locomotives, in charge of the proper management and operating of locomotives in service, instruction and discipline of enginemen in the proper performance of their duties, reporting to the Division Master Mechanic on locomotive operation, and to the Superintendent on discipline of enginemen. Office, Joliette.

J. HODGSON, heretofore Car Foreman, C.N.Q.R., has been appointed Foreman, Car Department, in charge of the maintenance of car equipment, including car shops, car inspectors and men employed in car repairs, reporting to the General Foreman, Car Department. Office, Joliette.

LAKE ST. JOHN DIVISION.—J. H. DAVIDSON, heretofore Superintendent, Q. & L. St. J. R., has been appointed Superintendent, in charge of the transportation and maintenance of way departments, reporting to the General Superintendent. Office, Quebec.

H. B. CASSIDY, heretofore Roadmaster, Q. & L. St. J. R., Limoilou Jct., has been appointed Roadmaster, in charge of all matters relating to the maintenance of roadbed, track, yards and grounds and property, and employes engaged thereon, reporting to the Superintendent. Office, Quebec.

J. FRIGON has been appointed Supervisor of Track, in charge of the maintenance of roadbed, tracks and right of way and grounds, and men employed in track work, reporting to the Roadmaster. Office, Chambord.

L. P. McGEE has been appointed Assistant Supervisor of Bridges and Buildings, in charge of the maintenance of bridges, trestles, culverts, station and other buildings, scales, water service and men engaged thereon, reporting to the Supervisor of Bridges and Buildings, Quebec Grand Division, Joliette. Office, Limoilou.

T. S. LOWE, heretofore Road Foreman of Locomotives, Q. & L. St. J. R., Quebec, has been appointed Master Mechanic, in charge of the maintenance of locomotives, including machine shops and locomotive terminals, and employes engaged therein, in addition to performing the duties of the present road foreman of locomotives, reporting to the Division Master Mechanic, on locomotive operation, and to the Superintendent on discipline of enginemen. Office, Limoilou.

F. GOUGE, heretofore Assistant Car Foreman, C.N.Q.R., Quebec, has been appointed Foreman, Car Department, in charge of the maintenance of car equipment, including car shops, car inspectors, and men employed in car repairs, reporting to the General Foreman, Car Department, Joliette. Office, Limoilou.

ONTARIO GRAND DIVISION.—L. C. Fritch, Assistant to the President, C.N.R., has issued a circular, approved by D. B. Hanna, Third Vice President, stating that the following lines have been designated the Ontario Grand Division:—C. N. Ontario, Central Ontario, Bay of Quinte, Irondale, Bancroft and Ottawa, and Brockville, Westport and North Western Railways. The Grand Division is divided into the Ottawa and Toronto Divisions.

A. J. HILLS, heretofore Superintendent, C.N.O.R., has been appointed General Superintendent, Ontario Grand Division, with jurisdiction over the transportation, maintenance of way and mechanical departments. Office, Toronto.

R. A. BALDWIN, of Mackenzie, Mann & Co.'s engineering staff, has been appointed Engineer Maintenance of Way. Office, Toronto.

T. R. McLEOD, heretofore Master Mechanic, C.N.O.R., has been appointed Division Master Mechanic. Office, Toronto.

L. C. THOMSON, heretofore Storekeeper, C.N.O.R., has been appointed Division Storekeeper. Office, Toronto.

THE OTTAWA DIVISION comprises:—Trenton District, East Don to Trenton; Rideau District, Trenton to Ottawa; Central Ontario District, Picton to Wallace; Irondale Branch, Bancroft to Kinmount; Coe Hill Branch, Ormsby Jct. to Coe Hill; Marmora Branch, Marmora Jct. to Cordova; Quinte District, Yarker to Bannockburn; Kingston District, Kingston to Harrowsmith; Brockville District, Brockville to Westport.

GEORGE COLLINS, heretofore General Manager, Central Ontario Ry., Trenton, has been appointed Superintendent, Ottawa Division, with jurisdiction over the transportation, mechanical and maintenance of way departments. Office, Trenton.

J. D. EVANS, heretofore Chief Engineer, Central Ontario Ry., has been appointed Division Engineer. Office, Trenton.

R. S. DERBYSHIRE, heretofore Assistant Superintendent, C.O.R., has been appointed Assistant Superintendent. Office, Trenton.

H. B. SHERWOOD, heretofore Superintendent, B. of Q. R., has been appointed Superintendent. [Editor's Note.—His jurisdiction is over branch lines between Ottawa and Toronto, reporting to Geo. Collins, Superintendent, Trenton.] Office, Napanee.

S. J. KITCHEN, heretofore Trainmaster, B. of Q.R., Napanee, Ont., has been appointed Trainmaster. Office, Trenton.

E. MYERS, heretofore Roadmaster, C. N. O. R., has been appointed Roadmaster. Office, Toronto.

THE TORONTO DIVISION comprises:—Parry Sound District, Toronto to Parry Sound, including Toronto Terminals; Sudbury District, Parry Sound to Capreol; Orillia Branch, Udney to Orillia; Key Harbor Branch, Key Junction to Sudbury; Sudbury Branch, Sudbury Jct. to Sudbury; Garson Branch, Garson Jct. to Garson Mines; Algoma Branch; Ruel District, Capreol to Ruel; and Sellwood Branch, Sellwood Jct. to Sellwood.

W. J. CURLE, heretofore Superintendent and General Freight and Passenger Agent, B. W. and N. W. R., has been appointed Superintendent, Toronto Division, with jurisdiction over transportation, mechanical

and maintenance of way departments. Office, Toronto.

W. WALSH, heretofore Assistant Roadmaster, C.N.O.R., Port Hope, has been appointed Supervisor of Track, with jurisdiction over track from Toronto to Napanee. Office, Trenton.

O. OGDEN, heretofore Assistant Roadmaster, C.N.O.R., Sudbury, has been appointed Supervisor of Track, with jurisdiction from Ottawa to Napanee, and over Brockville District. Office, Ottawa.

D. McDONALD, heretofore Roadmaster, C.O.R., has been appointed Supervisor of Track, with jurisdiction over Central Ontario, Quinte and Kingston Districts. Office, Trenton.

W. C. MOORE, heretofore Road Foreman of Locomotives, C.N.O.R., Toronto, has been appointed Road Foreman of Locomotives. Office, Trenton.

J. W. FINDLAY has been appointed General Foreman. Office, Parry Sound.

W. R. KELLY, heretofore Trainmaster, C.N.O.R., Rosedale, Toronto, has been appointed Assistant Superintendent. Office, Toronto.

E. HAYSTEAD, heretofore Assistant Roadmaster, C.N.O.R., Sydenham, has been appointed Supervisor of Track, with jurisdiction from Toronto to Parry Sound. Office, Toronto.

G. M. ELLIOTT, heretofore Assistant Roadmaster, C.N.O.R., Beaverton, has been appointed Supervisor of Track, with jurisdiction from Parry Sound northerly. Office, Parry Sound.

W. H. SEE, heretofore Bridge and Building Inspector, C.N.O.R., has been appointed Supervisor of Bridges and Buildings. Office, Toronto.

P. H. FOX, heretofore dispatcher, C.N.O.R., has been appointed Chief Dispatcher. Office, Toronto.

J. C. O'DONNELL, heretofore Trainmaster, District 1, Central Division, Rainy River, Ont., has been appointed Superintendent, District 3, Western Division, vice I. L. Boomer, transferred. Office, Edmonton, Alta.

I. L. BOOMER, heretofore Superintendent, District 3, Western Division, Edmonton, Alta., has been appointed Superintendent, District 4, Western Division. Office, Calgary, Alta.

M. G. HURD, heretofore Chief Dispatcher, Saskatoon, Sask., is reported to have been appointed Chief Dispatcher and Trainmaster, Calgary, Alta.

R. NELSON, heretofore Chief Dispatcher, Edmonton, Alta., is reported to have been appointed Chief Dispatcher and Trainmaster there.

Canadian Pacific Ry.—J. J. F. HOUGHTON has been appointed acting Chief Inspector of Time Service, Eastern Lines, Montreal, during the absence of his son, S. Houghton.

A. O. SEYMOUR, heretofore General Travelling Passenger Agent, Montreal, has been appointed General Tourist Agent, vice A. J. Blaisdell, promoted. Office, Montreal.

N. R. DES BRISAY, heretofore Travelling Passenger Agent, St. John, N.B., has been appointed General Travelling Passenger Agent, Montreal, vice A. O. Seymour, promoted.

W. B. WAY, heretofore Superintendent, District 1, Eastern Division, Farnham, Que., has been appointed Inspector of Transportation, Eastern Lines. Office, Montreal.

J. R. WATSON has been appointed Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Montreal.

J. E. RYAN, heretofore Chief Dispatcher, Medicine Hat, Alta., has been appointed Chief Dispatcher, Havelock, Ont.

T. A. NETTERFIELD has been appointed Roadmaster, in charge of Hamilton, Goderich and Listowel Subdivisions, vice A. Cameron, retired. Office, Guelph, Ont.

CARL MORSE, heretofore District Freight Agent, Fort William, Ont., is reported to have been appointed District Freight Agent, London, Ont., vice H. A. Plow, promoted.

G. HIAM, heretofore Travelling Freight Agent, Toronto, is reported to have been appointed District Freight Agent, Fort William, Ont., vice Carl Morse, transferred.

G. W. COBURN, heretofore Resident Engineer, Souris, Man., has been appointed Resident Engineer, Brandon, Man., vice C. G. Washbon, appointed Trainmaster, Souris, Man., as announced in our last issue.

H. M. SMITH, heretofore dispatcher, has been appointed Chief Dispatcher, Medicine Hat, Alta., vice J. E. Ryan, transferred to Havelock, Ont.

H. M. TAIT, heretofore General Agent, Steamship Department, Minneapolis, Minn., has been appointed Assistant General Agent, Steamship Department, Calgary, Alta.

J. A. McGREGOR, heretofore acting Superintendent, District 2, Alberta Division, Calgary, during the absence of F. Walker, on leave of absence, is reported to have been appointed Superintendent of a new district, with office at Edmonton.

R. E. LARMOUR, heretofore Division Freight Agent, Vancouver, B.C., is reported to have been appointed Assistant General Freight Agent there.

H. A. PLOW, heretofore District Freight Agent, London, Ont., is reported to have been appointed Division Freight Agent, Vancouver, B.C., vice R. E. Larmour, promoted.

GEORGE A. CLIFFORD, heretofore ticket agent, Cleveland, Ohio, has been appointed General Agent, Passenger Department, Railway and Steamship Lines, with territory in Ohio north of and including Pennsylvania Lines from East Liverpool to Indiana State line, via Alliance, Orrville, Bucyrus and Van Wert. Office, 213 Euclid Ave., Cleveland.

A. J. BLAISDELL, heretofore General Tourist Agent, Montreal, has been appointed General Agent, Passenger Department, Railway and Steamship Lines, with territory within 50 miles of St. Louis, Mo., in Illnois, Missouri, Arkansas, west of Mississippi River, Louisiana, Texas, Oklahoma, Kansas, Colorado, Wyoming, Utah, New Mexico, and Mexico, except on the Southern Pacific line from Nogales south. Office, 725 Olive St., St. Louis, Mo.

F. R. JOHNSON, General Agent, Passenger Department, Portland, Ore., is reported to have resigned.

Grand Trunk Pacific Ry.—GEORGE BRADSHAW, Safety Engineer, G.T.R., Montreal, has also been appointed Safety Engineer, G.T.P.R., with headquarters, temporarily, at Winnipeg, reporting to the Vice President and General Manager.

R H. HALL has been appointed Roundhouse Foreman, Regina, Sask., vice J. Neish, transferred to Transcona, Man., as machinist.

M. A. CAMPBELL has been appointed acting Resident Engineer, Biggar, Sask., vice H. A. Bowden, resigned to enter other service.

LOUIS LOW, heretofore Assistant Manager, Fort Garry Hotel, Winnipeg, has been appointed Manager, Macdonald Hotel, Edmonton, Alta.

The following station agents have been appointed:—Fallis, Alta., J. W. McCulla; Pacific, B.C., K. Bright; Priestly, B.C., R. A. Pake.

Grand Trunk Ry.—E. R. BATTLEY, heretofore Locomotive Foreman, Fort Erie, Ont., is reported to have been appointed General Foreman, Portland, Me., vice Jas. Gibson, resigned.

M. O. DAFOE, Travelling Passenger Agent, is reported to have been appointed acting City Ticket Agent, Montreal, vice W. H. Clancy, on three months leave of absence.

G. G. GRAMP, heretofore dispatcher, has been appointed Chief Dispatcher, Hamilton, Ont., vice H. R. McLennan, transferred to London, Ont.

H. R. McLENNAN, heretofore Chief Dispatcher, Hamilton, Ont., has been appointed Chief Dispatcher, London, Ont.

J. B. DUNLOP is reported to have been appointed Locomotive Foreman, Fort Erie, Ont., vice E. R. Battley, promoted.

The following station agents have been appointed:—St. Julie, Que., L. E. Robitaille; Mallorytown, Ont., C. C. E. Johnson; Findley, Ont., F. S. Pollard; Darlington, Ont., R. H. McCalphin; Utterson, Ont., W. Litchfield; Stayner, Ont., F. C. McKechnie; Clifford, Ont., J. L. Taylor; Mount Forest, Ont., J. G. Heyd; Hanover, Ont., J. F. Rae; Owen Sound, Ont., W. J. Riesberry; Brussels, Ont., W. J. Kyle; Joe Lake, Ont., C. Arnold; Suspension Bridge, N.Y., Pass., E. H. Brennan.

J. C. OLSEN has been appointed Assistant Engineer, Chicago, Ill., vice J. B. Gaut, appointed Superintendent of Bridges and Buildings there, as announced in our last issue.

Greater Winnipeg Water District.—J. C. NELSON has been appointed Traffic Superintendent of the construction railway between Winnipeg and Shoal Lake, as reported in our last issue. The charter for this line only permits of it being operated as a construction railway in connection with the building of the Shoal Lake aqueduct.

Intercolonial Ry.—A. E. WELLWOOD, heretofore Trackmaster, Truro to Mulgrave Division, New Glasgow, N.S., has been appointed Trackmaster, Point Tupper to Sydney Division, vice J. C. Fulmore. Office, Sydney, N.S.

JAMES MORRISON has been appointed acting Trackmaster, Truro to Mulgrave Division, vice A. E. Wellwood. Office, New Glasgow, N.S.

Pere Marquette Rd.—E. E. CAIN, heretofore Superintendent, Toledo Division, has been appointed Superintendent, Chicago Division, vice J. W. Mulhern, resigned to enter another company's service. Office, Grand Rapids, Mich.

Reid Newfoundland Co.—JOHN. M. LYONS, formerly General Passenger Agent, Intercolonial Ry., Moncton, N.B., has been appointed Eastern Traffic Agent, R. N. Co. Office, Moncton, N.B.

Toronto Terminals Railway.—H. G. Kelley, Vice President, G.T.R., has been elected President, T.T.R. Co., succeeding the late W. Wainwright, and J. W. Leonard, Assistant to Vice President, C.P.R., has been elected Managing Director, T.T.R. Co.

Student Course on Canadian Pacific Ry.—With a view to systematizing the course of instruction for students, under the company's arrangement for co-operating with McGill University, while they are in service on the road, the following programme has been arranged,—First year, vacation, three months as special apprentice at Angus Shops; Second year, vacation, three months as special apprentice at a roundhouse; Third year, vacation, three months on road service as an extra brakeman; after graduation, three months in station service, two months in stores department, three months in master mechanic's service, three months in accounting department, three months on track work; two months in car department, three months in yard office, and five months in superintendent's office.

United States Steam Railway Statistics to June 30, 1913.

This abstract is based upon compilations for the annual statistical report of the Interstate Commerce Commission for the year ended June 30, 1913, made from the annual reports of carriers having operating revenues above $100,000 for the year and also of railway companies owning property operated under lease or other agreement by those carriers. Returns of switching and terminal companies are not included. Advance figures given in this abstract may be slightly modified by revision before final publication.

Mileage.—The roads covered by this abstract represented 244,418.49 miles of line operated, including 11,162.97 miles used under trackage rights. The aggregate mileage of railway tracks of all kinds covered by operating returns for these roads was 369,579.80 miles. This mileage was thus classified: Single track, 244,418.49 miles; second track, 26,270.55; third track, 2,588.68; fourth, fifth, and sixth tracks, 1,964.06; yard track and sidings, 94,338.02. These figures indicate, for the roads under consideration, an increase of 8,628.36 miles over corresponding returns for 1912 in the aggregate length of all tracks, of which increase 3,157.59 miles, or 36.59%, represent yard track and sidings.

Equipment.—There were 63,376 locomotives in service on June 30, 1913, an increase of 2,102 over corresponding returns for such roads for the previous year. Of the total number of locomotives, 14,396 were classified as passenger, 37,924 as freight, 9,834 as switching, and 1,224 were unclassified.

The total number of cars of all classes in service was 2,445,508 (76,566 more than on June 30, 1912), which equipment was thus assigned: Passenger service, 51,700 cars; freight service, 2,273,564; company's service, 120,244. The figures given do not include so-called private cars of commercial firms or corporations. Of cars in freight service, there were classified 2,273,289, as follows:

Description.	Number.	Aggregate Capacity.
Box	1,032,585	35,607,134
Flat	147,541	5,151,054
Stock	78,308	2,421,827
Coal	871,339	38,314,920
Tank	8,216	327,727
Refrigerator	43,389	1,357,403
Other cars in freight service	91,911	3,798,080
Total	2,273,289	86,978,145

The average number of locomotives per 1,000 miles of line was 259, and the average number of cars per 1,000 miles of line, 10,005. The number of passenger miles per passenger locomotive was 2,341,269, and the number of ton miles per freight locomotive was 7,843,663.

The number of locomotives and cars in the service aggregated 2,508,886, of which 2,492,891, or 99.36% as against 99.20% in 1912, were fitted with train brakes, and 2,505,283, or 99.86% as against 99.81% in 1912, were fitted with automatic couplers. Of the 2,273,564 cars in freight service on June 30, 1913, the number fitted with train brakes was 2,266,162, and the number fitted with automatic couplers was 2,270,302.

Employes.—The total number of persons reported as on the pay rolls (not including those in the employ of roads the gross operating revenues of which were reported as less than $100,000 or those in the service of switching and terminal companies) was 1,815,239, or an average of 743 per 100 miles of line. As compared with corresponding returns for June 30, 1912, there was an increase of 115,298 in the total number of such railway employes. There were 67,026 enginemen, 70,477 firemen, 52,086 conductors, 146,855 other trainmen, and 38,253 switch tenders, crossing tenders, and watchmen. The total amount of wages and salaries reported as paid to railway employes during the year was $1,373,830,589.

Capitalization of Railway Property.—On June 30, 1913, according to the annual reports submitted to the commission by roads having gross operating revenues of $100,000 or more, together with returns made in reports filed in behalf of their nonoperating subsidiary lines, the par value of the amount of railway capital outstanding was $19,796,125,712. This includes capital held by the railway companies concerned, as well as by the public. Of the total amount of such capital outstanding there existed as stock $8,610,611,327, of which $7,231,515,045 was common and $1,379,096,282 was preferred; the remaining part, $11,185,514,385, representing funded debt, consisted of mortgage bonds, $8,186,366,426; collateral trust bonds, $1,189,636,796; plain bonds, debentures and notes, $1,107,076,783; income bonds, $250,290,655; miscellaneous funded obligations, $82,858,275; and equipment trust obligations, $369,285,450. Of the total capital stock outstanding for the roads under consideration, $2,836,023,744, or 32.94%, paid no dividends. The amount of dividends declared during the year (by both operating and nonoperating companies represented in this statement) was $368,606,327, being equivalent to 6.38% on dividend paying stock. The average rate of dividends paid on all stocks outstanding pertaining to the roads under consideration was 4.28%. No interest was paid on $1,128,776,748, or 10.44% of the total amount of funded debt outstanding (other than equipment trust obligations).

Investment in Road and Equipment.—The figures presented under this caption include returns for investment in road and equipment, shown by the operating roads covered by this abstract, as well as by their subsidiary nonoperating roads (leased, operated under contract, etc.). The expenditures for additions and betterments, as well as the expenditures for new lines and extensions, during the fiscal year 1913 are analyzed in the following tabular statement:

Investment to June 30, 1913			$16,351,639,266
Investment to June 30, 1912			15,874,579,626
Increase 1913 over 1912			$477,059,640
	Expenditures for additions and betterments.	Expenditures for new lines and extensions.	
From cash or other working assets	$329,511,772	$54,819,241	
From special appropriations	48,079,165	473,281	
Through issue of securities	162,597,278	63,692,746	
Not assigned to any of the above classes	5,801,127	10,263,251	
Total	$545,989,342	$129,248,519	$675,237,861
Miscellaneous charges not classified			4,847,012
Total Expenditures during year			$680,084,873
		Credits.	
Property retired or converted		$79,495,571	
Adjustments		5,058,790	
Difference between record value of grantor and purchase price of grantee in cases of roads sold, merged, consolidated, etc.		118,470,872	
Total			$203,025,233
Net increase during year			$477,059,640

Public Service of Railways.—The number of passengers carried during the year was 1,033,679,680. The increase in the number of passengers carried during the year over corresponding returns for 1912 was 39,307,397.

The passenger mileage, or the number of passengers carried one mile, reported by roads represented in this statement, was 34,,575,872,980. The corresponding return for 1912 was 1,536,762,172 less. The number of passengers carried one mile per mile of road was 143,067, against 140,393 for the preceding year.

The number of tons of freight reported as carried (including freight received from connections) was 2,058,035,487, while the corresponding figure for the previous year was 1,818,795,630.

The ton mileage, or the number of tons carried one mile, as reported for the year, was 301,398,752,108. The corresponding ton mileage as reported for the year ended June 30, 1912, was 263,779,908,254. The number of tons carried one mile per mile of road for the year ended June 30, 1913, was 1,245,158, against 1,110,811 for the preceding year. The average number of tons of freight per train mile was 445.45. The corresponding figure for the preceding year was 410.26.

The average receipts per passenger per mile, as computed for the year, for the roads covered by this statement, were 2.008c.; the average receipts per ton per mile, 0.729c. The passenger service train revenue per train mile was $1.35.555; the freight revenue per train-mile was $3.24.347. The average operating revenues per train mile were $2.45.387. The average operating expenses per train mile were $1.70.374. The ratio of operating expenses to operating revenues was 69.44%.

Revenues and Expenses.—As in the case of other figures in this abstract, the revenues and expenses shown below exclude returns for roads the gross operating revenues of which were less than $100,000 for the year. The operating revenues of the railways for the year, herein represented (average mileage operated 242,657.12 miles), were $3,125,135,798; their operating expenses were $2,169,968,924. The corresponding returns for 1912 (average mileage operated 238,220.11 miles) were: Operating revenues, $2,826,958,366; operating expenses, $1,959,094,658. The following figures present a statement of the operating revenues for 1913 in detail:

Freight revenue	$2,198,930,565
Passenger revenue	695,987,817
Excess baggage revenue	7,607,802
Parlor and chair car revenue	715,566
Mail revenue	50,789,212
Express revenue	79,717,266
Milk revenue (on passenger trains)	9,057,591
Other passenger revenue	6,110,252
Special service train revenue	1,980,362
Miscellaneous transportation rev-	
Switching revenue	33,248,734
enue	6,861,901
Total revenue from operations other than transportation	31,628,843

Joint facilities—Dr.	1,054,003
Joint facilities—Cr.	3,553,890
Total operating revenues	$3,125,135,798

Operating expenses, as assigned to the five general classes, were:

Maintenance of way and structures	$421,232,395
Maintenance of equipment	511,561,363
Traffic expenses	62,850,113
Transportation expenses	1,096,252,745
General expenses	78,072,308
Total operating expenses	$2,169,968,924

With minor eliminations from the figures given above operating revenues per mile of line operated (including line operated under trackage rights) averaged $12,873 and operating expenses $8,939 for the year.

Condensed Income Account and Profit and Loss Account.—There is given below a condensed income account and profit and loss account of operating roads, the gross operating revenues of which were $100,000 or more for the year. A similar statement follows for nonoperating roads (leased, operated under contract, etc.) controlled by the operating roads described. The statements omit returns for a few roads the reports of which were not sufficiently complete for inclusion therein. The accounts of the operating roads include both operating and financial transactions, while the accounts of the nonoperating roads are confined for the most part to receipts and payments under leases, contracts, and agreements. For a number of items, such as dividends, taxes, etc., both statements must be taken into consideration in order to learn the aggregates of such items for the railways therein represented. Thus the aggregate of dividends declared during the year, $368,552,632, includes those declared out of current income and those declared from surplus both by the operating roads and by the nonoperating roads. This amount includes dividends declared on railway capital stock owned by other railway companies.

OPERATING ROADS.
Income Account.

Rail operations:	
Operating revenues	$3,125,135,798
Operating expenses	2,169,968,924
Net operating revenue	$955,166,874
Outside operations:	
Revenues	$67,982,036
Expenses	65,953,702
Net revenue from outside operations	$2,028,334
Total net revenue	$957,195,208
Taxes accrued	122,005,424
Operating income	$835,189,784
Other income	283,063,093
Gross income	$1,118,252,877
Rents, interest, and similar deductions from gross income	629,706,398
Net corporate income	$488,546,479
Disposition of net corporate income:	
Dividends declared from current income	$241,750,512
Appropriations for additions and betterments	48,022,688
Appropriations for new lines and extensions	70,159
Miscellaneous appropriations	14,991,076
Stock discount extinguished through income	6,497
Total	$304,840,932
Balance to credit of profit and loss	$183,705,547

Profit and Loss Account.

Credit balance on June 30, 1912	$1,078,765,200
Credit balance for year 1913 from income account	183,705,547
	$1,262,470,747
Dividends declared out of surplus	85,706,629
Difference	$1,176,764,118
Appropriations for additions and betterments	$15,158,827
Appropriations for new lines and extensions	449,652
Miscellaneous appropriations	68,723,482
Other profit and loss items—debit balance	20,691,684
Total	$105,023,645
Balance credit June 30, 1913, carried to balance sheet	$1,071,740,473

NONOPERATING ROADS.
Income Account.

Gross income from lease of road.	$124,332,275
Taxes accrued	5,326,536
Net income from lease of road.	$119,005,739
Other income	7,777,635
Gross income	$126,783,374
Interest, and similar deductions from gross income	68,568,734
Net corporate income	$58,214,640
Disposition of net corporate income:	
Dividends declared from current income	$38,845,422
Appropriations for additions and betterments	2,140,855
Appropriations for new lines and extensions	59,491
Miscellaneous appropriations	1,274,520
Total	$42,320,288
Balance to credit of profit and loss	$15,894,352

Profit and Loss Account.

Credit balance on June 30, 1912	$57,158,330
Credit balance for year 1913 from income account	15,894,352
Total	$73,052,682
Dividends declared out of surplus	2,250,069
Difference	$70,802,613
Appropriations for additions and betterments	$500,665
Appropriations for new lines and extensions	208
Miscellaneous appropriations	29,945,358
Other profit and loss items—credit balance	$2,932,044
Total	$27,514,187
Balance credit June 30, 1913, carried to balance sheet	$43,288,426

The Southampton Railway Investigation.—The investigation into the cost of the Southampton Ry. in New Brunswick, conducted on behalf of the Dominion Government by R. A. Pringle, K.C., of Ottawa, as a result of charges made by F. B. Carvell, M.P., details of which were given in our April issue, pg. 173, was concluded at Fredericton, July 13. According to the figures of J. K. Pendar, M.L.A., who was the principal promoter of the line, the railway cost $255,673.33, which included $28,466.33, which he claims he supplied from his own personal resources. Evidence given before the Commissioner made it appear that the cost of the line did not exceed $17,700 a mile. Independent engineering experts, who went over the line, calculated the value of the work done at $159,000. In order to obtain the Dominion Government subsidy of $6,400 a mile it had to be shown that the line cost $21,400 a mile. As a result of the figures put before the Dominion Government Inspecting Engineer, E. V. Johnson, a certificate to this effect was given, on the strength of which the company received $3,200 a mile of a subsidy more than it was entitled to. In concluding the enquiry the commission is reported to have said it was plain that the responsibility for this lay between J. K. Pendar, the principal promoter, and D. W. Brown, the Chief Engineer.

Lake Huron and Northern Railway.—Negotiations are said to be in progress in England for an issue of bonds to finance the construction of this line from Rock Lake, Ont., to the National Transcontinental Railway under the act passed by the Ontario Legislature in 1913.

Equipment of Cabooses With Marker Sockets.

The Board of Railway Commissioners passed general order 127, dated July 6, as follows: Re putting up and taking down of marker lights on cabooses, and circular 130, March 11, 1914, submitted to the railway companies upon the reading of the replies filed by the railway companies, and the report of the Chief Operating Officer of the Board, certain of the railway companies consenting to the adoption of the regulations particularly set out in this order regarding the putting up and taking down of marker lights on cabooses, it is ordered that cabooses of all railway companies be equipped as follows: Where cabooses are equipped with marker sockets in the lower position, markers shall be carried in such lower sockets. All cabooses hereafter constructed shall be equipped with marker sockets in the lower position. All cabooses now in use not equipped with marker sockets in the lower position, shall be so equipped on or before Nov. 1, 1914.

A musolophone. which has been installed in Windsor St. station, C.P.R., Montreal, recently, is an adaptation of the telephone, used for announcing the trains in the waiting rooms and other parts of the station. A single announcer talks into a telephone transmitter, connecting with as many telephone announcing instruments as may be desired. A similar device was installed recently in the Grand Central terminal station in New York, but on account of the echoes which developed in the large central waiting room, its use has been discontinued, except in the smaller rooms.

Department of Railways and Canals.

NEW WELLAND SHIP CANAL.

Notice to dealers in Portland Cement.

SEALED TENDERS, endorsed "Tender for Cement," will be received by the undersigned up to 10 o'clock on Tuesday, 25th August, 1914, for the supply of 2,500,000 barrels of Portland Cement which will be required in the construction of the new Welland Ship Canal, to be delivered as the work progresses, in such quantities, at such places along the Canal and at such times as the Department may require. It is estimated that the total amount will be consumed within the next four years.

Tenders may be submitted for the whole or any portion of the quantity required.

The Cement must be in conformity with the Department's standard specification for Portland Cement. Specifications, forms of tender and full information can be obtained upon application to the Purchasing Agent, Department of Railways and Canals, Ottawa.

The Department does not bind itself to accept the lowest or any tender.

By order,

L. K. JONES,

Asst. Deputy Minister and Secretary.

Department of Railways and Canals.

Ottawa, 25th July, 1914.

Newspapers inserting this advertisement without authority from the Department will not be paid for it.—64842.

Electric Railway Department

Car Barn for British Columbia Electric Railway.

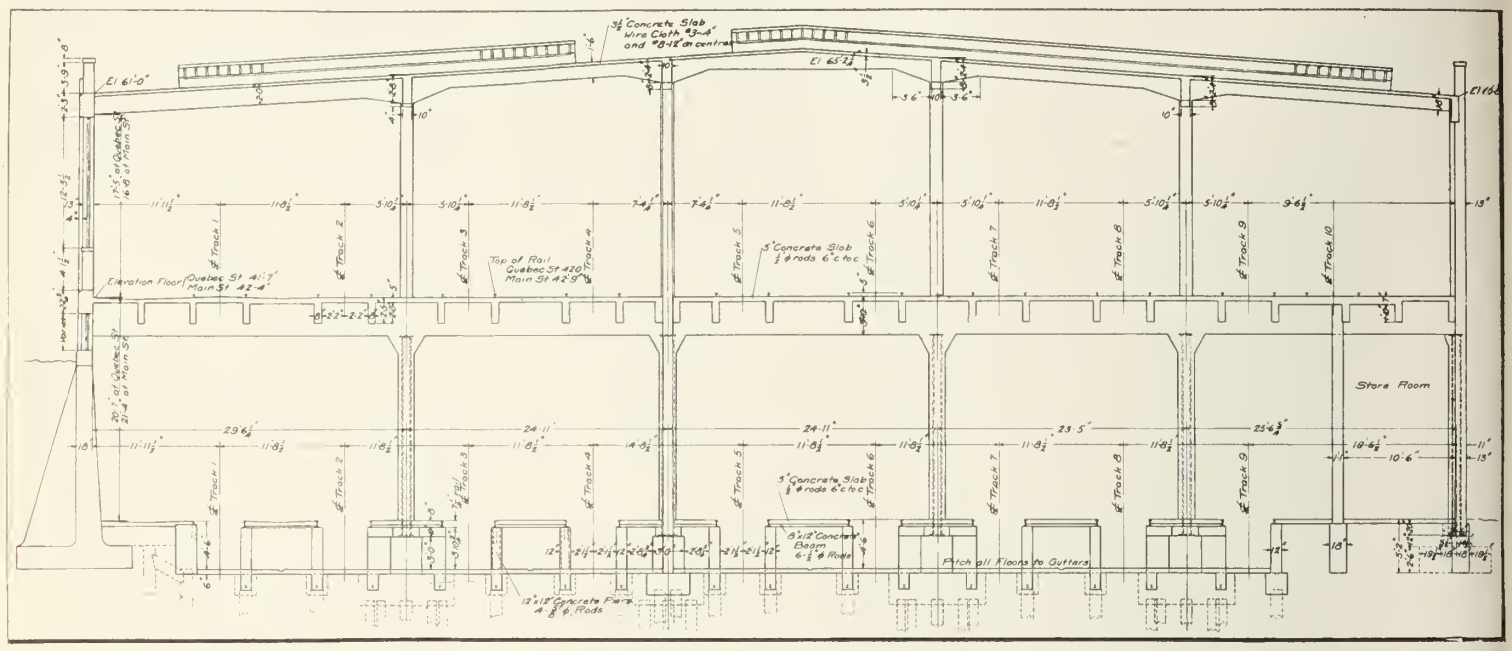
The car barn under construction in the Mt. Pleasant district, in Vancouver, is shown in the accompanying plans. It will be a double deck barn, of reinforced concrete beam and girder construction, brick walls, steel sash glazed with ¼ in. wired glass, and rolling steel doors. A brick fire wall extending from the lower floor to the roof will divide the building into two fire sections. The first floor will have inspection pits arranged to form a basement under the lower floor, so that each track within a fire division will be accessible from every other track. The barn will be equipped with both roof and aisle sprinklers throughout. One track on the lower floor and one on the upper floor will be arranged as a wash and paint track. A sand drier room and storeroom and an oil room will be provided on the lower floor, and there will also be a small repair shop near the storeroom for making light repairs. The total storage capacity will be 120 cars.

The general overall dimensions will be 351¼ by 130¾ ft., extending between Main and Quebec Sts., with Fourteenth St. along one side. There is a sufficient difference in elevation between Main and Quebec Sts. to make possible the two floor scheme, the lower level being entered from the Quebec St. elevation, and the upper floor from the Main St. elevation, both entrances being at grade.

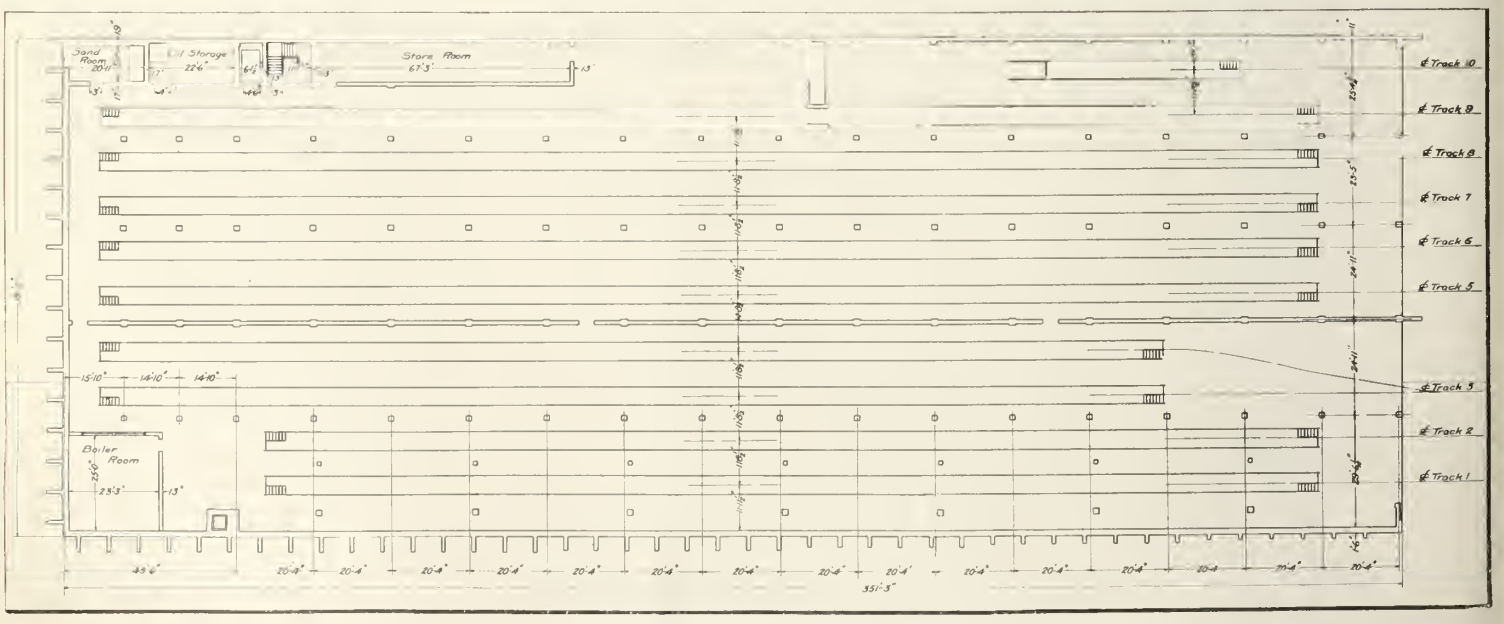
The lower floor will consist of 5 in. reinforced concrete slabs between adjoining rails, supported on 12 in. square concrete piers from the pit floor below, these piers being at about 7 ft. centres, in line with the rail centres. The pit floor will be 4½ ft. below that of the lower level, and formed of 6 ins. of concrete, with piers under each of the track pedestals and building columns.

The upper floor will be a 5 in. reinforced concrete slab construction, with 8 by 24 in. reinforced concrete girders extending under the rails. The floor will be supported on concrete columns between each pair of tracks, the columns varying in centre to centre distance across the building from 23 ft. 5 ins. to 29 ft. 6¼ ins. The lengthwise spacing will be 20 ft. 4 ins. The cross girders between the columns will be 3 ft. 10 ins. deep.

The roof will be a 3½ in. reinforced concrete slab, carried on cross concrete beams 18 ins. deep. Westinghouse, Church, Kerr and Co. are the contractors.



Cross Section of Mt. Pleasant Car Barn for British Columbia Electric Railway.



Lower Floor Plan of Mt. Pleasant Car Barn for British Columbia Electric Railway.

Montreal Tramways Mutual Benefit Association.

Following are extracts from the 11th annual report for the year ended April 30, presented at the annual meeting recently:—

Summary of relief work done during the year:

Members disabled through sickness or injury	1,492
Visits made by physicians to disabled members	778
Consultations given by physicians to disabled members	7,977
Prescriptions issued	5,597
Paid for sickness and injury	$10,365.50
Paid for medicine	1,729.03
Paid for pensions	547.00
Paid for withdrawals	504.53
Paid for death and burial insurance	12,833.36

Twenty six members died during the year, their death and burial benefits being paid promptly. Five members applied to have their benefits commuted, which was agreed to. Following is the financial statement:—

REVENUE.

Accumulated Reserve from preceding years		$117,080.60
From Members—		
Fees	$ 1,097.00	
Dues	17,397.00	
		18,494.00
From Company—		
Fees	1,097.00	
Dues	8,698.50	
Special Donation	4,000.00	
Expenses of management	6,404.54	
		20,200.04
Picnic	9,555.73	
Interest on investments	7,417.50	
Interest on Bank Deposits	237.60	
		17,210.83
		$172,985.47

EXPENSES.

Sickness and injury	$10,365.50	
Deaths and burials	12,833.36	
Medical examinations	595.50	
Medical attendance	3,551.61	
Medicine	1,729.03	
Withdrawals	504.53	
Pensions	547.00	
Management expenses	6,404.54	
		$36,531.07
Accumulated reserve—		
To 1913	117,080.60	
For 1914	19,373.80	
Total accumulated reserve	$136,454.40	
In bank		11,848.81
Invested		124,605.59
		$172,985.47

The committee of management is as follows: J. E. Hutcheson, President; Patrick Dubee, Secretary-Treasurer; F. Brisette, E. A. Robert, H. Brisebois, A. Gaboury, A. Latremouille, A. S. Byrd, A. Pichette, R. M. Hannaford, W. Thibault, D. E. Blair, J. Lalonde, J. L. Perron, K. C., L. Benoit.

It costs $1 to join the association and 50c a month to secure the following benefits:—

In cases of disablement after the first 6 days, 60c per day for 90 days, and 30c per day for the next 90 days; free medical attendance; free medicine; twenty per cent. discount on all medicines, etc., required by members of the family. A life insurance policy of $500, and $50 towards funeral expenses. A pension when superannuated and too old to work. Members leaving service after 5 years membership are entitled to a refund of one third of fees and dues paid in by them, less amount received in benefits. Members leaving service after 10 years membership are entitled to a refund of two thirds fees and dues paid in by them, less amount received in benefits.

Answers to Questions on Electric Railway Topics.

Following are answers to questions in the American Electric Railway Association's question box, sent in by officials of Canadian electric railways:—

Motor Wiring.—What advantages are derived from connecting field coils ahead of armature coils?

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—We have had considerable experience with both methods, and have found that connecting armature ahead of field has very decided advantages. It is very much easier to provide permanent insulation for the armature coils than for field coils, especially when field coils are unimpregnated. In case of lightning surges, brush holders and commutator provide creepage surface and operate as a more or less efficient lightning arrester, voltage being kept within the limits of armature insulation. Our lightning troubles have been almost entirely eliminated since we standardized on connecting armature first.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY-TREASURER — Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY — Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

W. R. McRae, Master Mechanic, Toronto Ry.—There is one slight advantage derived from connecting field coils ahead of armature. It will to a considerable extent stop flash-overs at brushes and commutator short circuits, with their ultimate burn-outs, caused by excessive feeding of current to motor by operator. This however can be prevented by the use of a controller check. There are several advantages to be gained by connecting armature ahead of field coils, namely,—less liability of armatures developing grounds, etc. It is often impossible to operate a motor with a grounded field coil. This, of course, depends on which coil is grounded. It is also less expensive to repair field coils than armature windings.

Shed and Shop Lighting.—What is the best artificial light to use in car sheds and shops?

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—We have discarded arc lamps and small carbon units for Tungsten lamps with enameled steel reflectors in units varying from 100 to 250 watts, according to requirements. Present arrangement has proved very satisfactory from every point of view.

W. R. McRae, Master Mechanic, Toronto Ry.—Incandescent lighting. Whiten walls and ceilings with air sprayer, using calcimo or some other good white water wash.

Wheel Failures.—What conditions govern the changing of wheels of various types in service?

W. R. McRae, Master Mechanic, Toronto Ry.—Chipped and worn flanges, worn flat, skidded flat beyond grinding without removing, slipped wheels, shelled out treads, and steel wheels when one wheel is worn smaller in diameter than its mate.

Seats for Platform Men.—What is the best type of seat for conductors on prepayment cars, when such seats are used? What is the best type of seat for motormen on all types of cars?

A. Gaboury, Superintendent, Montreal Tramways Co.—The seats for conductors on all our prepayment cars are folding, attached to the bulkhead frame between the exit and entrance doors on the rear platform. When not in use they drop flat against the partition. Regarding seats for motormen, this, I think, would depend largely on the type of car used. In our company in cars with large motorman's vestibule we use a round wooden seat supported on an iron pipe which fits into an iron receptacle in a hole in the floor of the platform. There is also a similar receptacle put in the floor, about 2 ft. in the rear and somewhat to the side of the first one, so that when the stool is not in use the motorman must move it from its position in front of the controller to the second hole, out of the way. On our cars of the semi-vestibule type, we have a folding seat attached to the half partition separating the motorman from the passengers. This seat is held up by a spring, and when not in use drops flat against the partition.

Neatness of Car Crew.—Neatness and cleanliness in the appearance of platform men is desirable. What methods are used to secure this condition, and do any companies have a system of inspection?

A. Gaboury, Superintendent, Montreal Tramways Co.—The necessity for neatness and cleanliness is impressed on our men from the very moment that a new man is first taken on. Immediately a student receives his training badge and papers, he receives also a pamphlet drawing to his attention three things,—discipline, personal appearance and courtesy. In each of our stations there are large toilet rooms fitted up with every convenience, and in the men's waiting room there are also large mirrors, whereby they cannot help but note their appearance. Our rules and regulations require that a man be clothed in full regulation uniform, that his clothes be neat and clean, his buttons and badges polished and shined and his uniform cap worn straight on his head, and our depot clerks and car starters have instructions to allow no man to take his car whose personal appearance is not beyond reproach. Our inspectors on the road also have similar instructions.

Vehicular Traffic Cooperation.—Have any companies conducted any special campaign with the idea of educating drivers of vehicles to keep out of the tracks?

A. Gaboury, Superintendent, Montreal Tramways Co.—In connection with a campaign of education for the prevention of accidents, which has been carried out for the past two years amongst our own employes, I recently inaugurated a public safety first campaign, in the course of which the first step was directed towards the most prolific source of accident, namely, collision between cars and vehicles. As there are always two

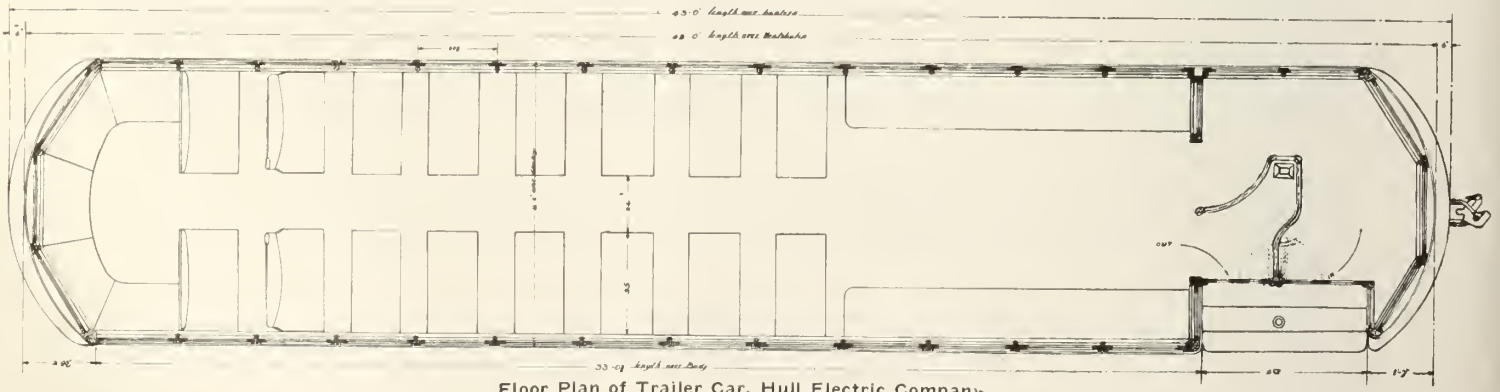
parties to accidents of this nature, our own men were first instructed, and with the idea of reaching the party of the second part, an individual letter was written to all cartage, express and transfer companies, department stores, breweries, etc., explaining the need of a campaign of this nature, pointing out to them that their interests and ours should be mutual, and asking for their cooperation along these lines. Form letters were then sent to all automobilists and drivers of other vehicles, also with the same end in view. A folder of "don'ts," sugar coated as suggestions for safety first, was got out in vest pocket size and mailed to the home addresses of all drivers and chauffeurs. These suggestions were also got up in poster form on cardboard 18 by 24 ins., which were posted up in stables, garages and other prominent places. A circular was also sent by mail to drivers and chauffeurs explaining the existence of, and the dangers arising from, a greasy rail. This was also put out in poster form in stables and garages. Our aim in this campaign has been to bring about a better state of feeling between motormen on the cars and drivers on the street, and we have tried to present the matter to each from the point of view of the other, asking each to have due regard for the rights of others on the street. The results so far obtained have been far beyond our most sanguine expectations.

Trailer Cars for the Hull Electric Company.

The Hull Electric Company placed in service recently four single end semi convertible trailer cars. Following are some of the principal dimensions: Length over all, 43 ft.; length of body, 35¼ ft.; length of front vestibule, 6¾ ft.; width over side sheeting, 8½ ft.; width of car inside, 7 ft. 8 ins.; height from bottom of sill to top of roof, 8¾ ft.

The underframe is of wood, reinforced with steel plates and rods, side and intermediate sills are of B. C. fir, end sills and cross timbers are of best oak. Side and centre sills are reinforced with a steel plate running full length of same, sandwiched between inner and outer wood sills and securely bolted to same. The vestibule platform is on the same level as car floor, and is carried by the centre sills and side sill on closed side, and by a knee composed of a 5 in. I beam wood filled on step side. The outside of car is sheeted with matched poplar sheeting and is painted antique brown. The flooring is Georgia pine, laid double, with tar paper between and has wood matting strips laid lengthwise, running full length of car body in the aisle. The roof is of monitor type, with standard deck sash and openers. The interior trimming is best quality red cherry throughout. The seating consists of 16 stationary cross seats, two longitudinal seats at front end and a circular seat extending entirely around the rear end of car. All seats are of standard design and are covered with twill weave rattan. All sashes in body are arranged to raise to open. All windows on devil strip side are provided with window guards. The cars are also equipped with sanitary hand straps, storm sash, folding doors, p.a.y.e. rails, Coleman stationary fare boxes, Westinghouse automatic couplers, Consolidated truss plank heaters, and Consolidated buzzers. The car bodies, completely equipped without trucks, weigh about 1,900 lbs. These cars were built by the Ottawa Car Manufacturing Co., to specifications prepared by G. Gordon Gale, M. Can. Soc. C. E., General Superintendent, Hull Electric Co.

Trailer Car, Hull Electric Company.



Floor Plan of Trailer Car, Hull Electric Company.

An Edmonton, Alberta, press dispatch of July 20 said the municipal railway employes had decided at a mass meeting to strike, the management having refused promotions according to length of service.

British Columbia Electric Railway Floats in Historical Pageant.

In connection with the Pacific Coast Advertising Men's Clubs' convention, held in Vancouver, B. C., recently, a historical pageant was arranged by the citizens' committee. The chief feature was a street parade about five miles in length, in which were floats showing the progress of the city from its early days to the present time. The B. C. Electric Ry. Co. furnished a float depicting the early days of the street car service in the city and the comparative growth of the system. The float consisted of the first street car operated in Vancouver, mounted on a truck drawn by horses, the electrical equipment of the car having long since been taken out. The float was decorated with banners noting the exhibit as "Vancouver's First Street Car," as well as banners showing the growth of the city's system from the two cars available in 1889 to the 231 cars now available for city service. On the front platform of the car was Aubrey Elliott, the

oldest motorman in the service, while on the rear platform was J. Jeffreys the conductor longest in the service now in the company's employ. The float was a very striking exhibit of the company's growth, as well as a telling example of street car accommodation in the early days as compared with the modern and up to date cars now operated on the Vancouver lines.

Another float exhibited by the B. C. Electric Ry. was that of the light and power department, this being one of the finest in the procession. It was designed on the lines of its name, "The Source and The Service." It was mounted on an electric truck, the main feature being a model of one of the company's power stations which serve the city with electric current. This was 20 ft. long and 12 ft. high. While the parade was proceeding, streams of water were kept falling from the tail races, a three h. p. motor, operated from the storage battery of the truck, being utilized to pump the water from the storage tank. At each corner of the truck was a decorated booth illustrating the four branches of the service, industrial power, lighting, heating and domestic service. In each of these booths was a person representing the particular form of service and equipment suited to the various fields of operation. The entire float was decorated in the company's colors, green and gold.

The City and Suburban Motor Bus Co., Ltd., has been incorporated under the Dominion Companies Act, with $250,000 capital and office at Toronto, to carry on a general transportation business, without limiting the generality, but more particularly to run motor busses of all kinds on public highways in cities, towns and villages, and to transport passengers therein. The incorporators are J. R. L. Starr, G. Cooper, R. P. Locke, J. S. Emery and L. M. Heal, Toronto.

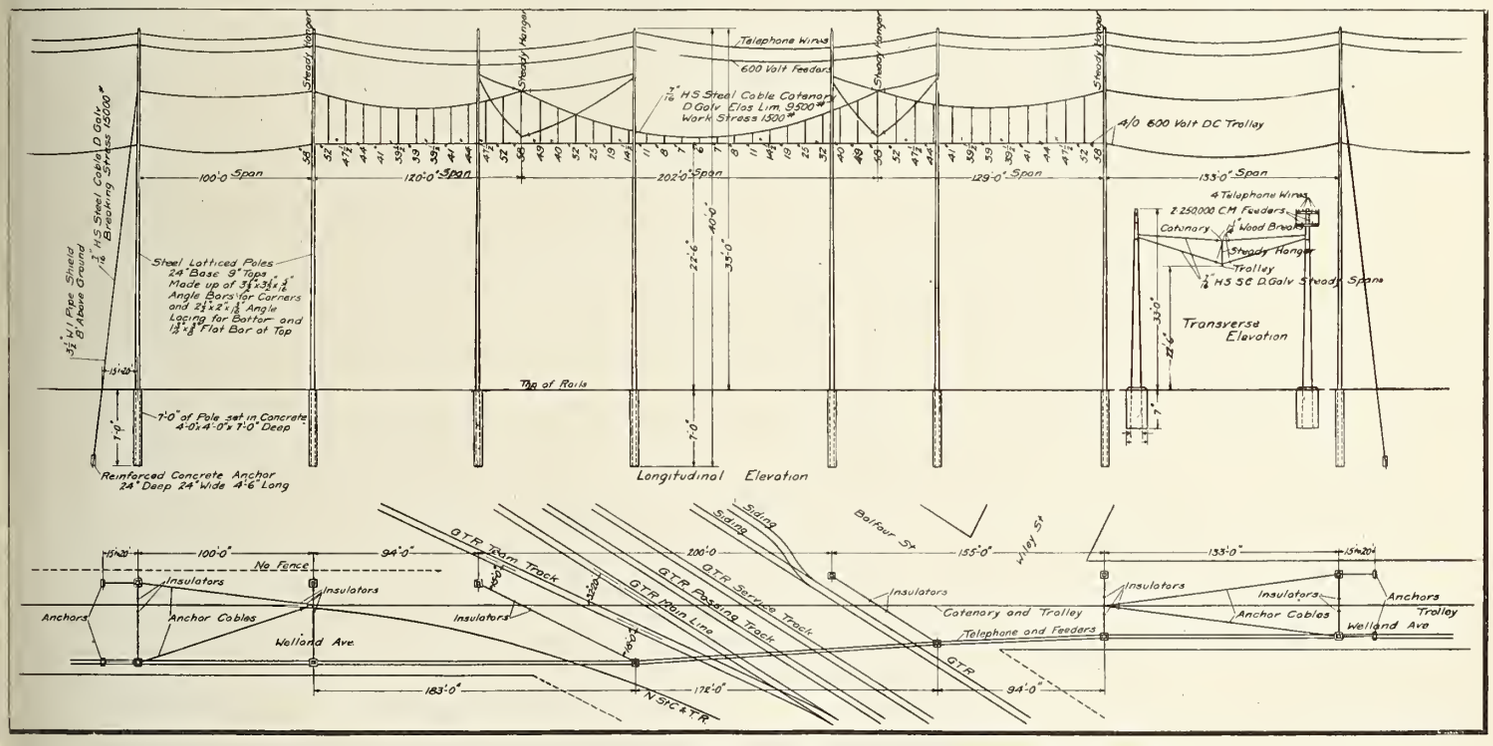
The Postoffice Department, according to press reports, has offered the Guelph Radial Ry., which is owned by the City of Guelph, Ont., $20 a year for the transportation of each postman in the city. This is a lower rate than is paid to any other electric railway in Canada.

Overhead Construction at a Railway Crossing on the Niagara, St.Catharines and Toronto Railway.

Near the outskirts of St. Catharines, Ont., on the new line to Niagara-on-the-Lake, recently placed in service by the Niagara, St. Catharines and Toronto Ry., a crossing of the G.T.R. Port Dalhousie branch is made at a rather acute angle of 32 degs. 20 mins. At this point on the G.T.R. there are five tracks, which, on account of the sharp angle of crossing, requires a very long span, necessitating a piece of special installation. The manner in which this was accomplished, is shown in the accompaning illustration.

The total work extends over 684 ft., employing 12 special lattice poles, 24 in. base and 9 in. tops, made up of four 3½ by 3½ by 5-16 in. angle bars for the corners, with 2½ by 2 by 3-16 in. angle lacing in the lower portion, and 1¾ by ⅜ in. flat bars for the top. These poles have a total length of 40 ft., and the lower 7 ft. are embedded in a 4 ft. square concrete casing of the same depth.

The trolley line is carried across in five spans, the three central ones of catenary construction. The central span is 202 ft., and the spans on either side are 120 and 129 ft. respectively. The three central pairs of poles support two steady spans, in the centre of which are steady hangers. The supporting catenary is carried from the top of the steady hangers, and is anchored by guys from the end of the catenary at spans 2 and 4, to the end poles, these latter being braced by cables attached to buried reinforced concrete anchors. The trolley line in the three catenary spans is supported from the latter by ⅛ by 1 in. straps. The clear height under the trolley is the authorized railway clearance of 22½ ft. The telephone and 600 volt feeder lines are carried on cross arms on the top of the southerly row of poles. We are indebted to W. H. Horton, Electrical Engineer, Niagara, St. Catharines and Toronto Ry., who was responsible for the design, for the information on which this article is based.



Overhead construction at a railway crossing on the Niagara, St. Catharines and Toronto Ry.

Electric Railway Finance, Meetings, Etc

Brandon Municipal Ry.—A report made to the Brandon, Man., City Council, July 4, stated that the operation of the municipal electric railway for June, showed an excess of receipts over expenses of about $500.

Brantford St. Ry.—Grand Valley Ry.—A circular has been sent to the bondholders of the G. V. Ry., by E. B. Stockdale, Receiver, stating that the meeting of bondholders called for July 15, would be postponed to Sept. 16, as the Brantford City Council would not have completed its search into the titles of the several properties in time to have the transfer ready for signing on the first named date.

British Columbia Electric Ry., and allied companies.—Gross earnings for May, $678,-314; operating expenses, maintenance, etc., $505,640; net earnings, $172,674, against $701,991 gross earnings; $497,223 operating expenses, maintenance, etc.; $204,768 net earnings, for May 1913. Aggregate gross earnings for 11 months ended May 31, $8,128,904; net earnings $2,197,497, against $7,811,546 aggregate gross earnings; $2,-233,666 net earnings for same period 1912-13.

Cape Breton Electric Co.—Gross earnings for May, $29,485.78; operating expenses and taxes, $16,095.03; net earnings, $13,390.75; interest charges, $5,247.78; balance, $8,-142.97; bond sinking and improvement funds, $1,190; balance for reserves, etc., $6,-952.97, against $29,989.33 gross earnings; $19,115.16 operating expenses and taxes; $10,874.17 net earnings; $4,891.67 interest charges; $5,982.50 balance; $1,190 bond sinking and improvement funds; $4,792.50 balance for reserves, etc., for May, 1913. Aggregate gross earnings for five months ended May 31, $139,036.30; net earnings, $56,464.79; interest, bond sinking and improvement funds, etc., $31,797.57; net balance, $24,667.23, against $142.570.68 aggregate gross earnings; $56,029.13 net earnings; $30,484.49, interest, bond sinking and improvement funds; $25,544.64, net balance for same period 1913.

Saskatoon Municipal Ry.—The financial statement presented at the June meeting of the Saskatoon, Sask., City Council, for the

quarter ended Mar. 31, contained the following particulars relating to the operations of the electric railway:—Receipts, cash fares, $10,604; tickets, $21,642; chartered cars, $132; city departments, $191; advertising, $842; general, $226; profit on Sutherland extension, $876; total, $34,617. Expenditures—Maintenance of way and structures, $1,449; maintenance of equipment, $5,286; traffic expenses, $285; conducting transportation, $26,363; general, $1,821; capital charges including interest, sinking fund and depreciation, $13,792; total, $48,998; loss, $14,480.

Traffic receipts for May, $14,440; expenditures, $14,250; profit, $190. This does not allow for depreciation. Mileage, 61,865; gross earnings per car mile, 23.343c.; operating expenses, 23.035c.; passengers carried 5.155; average fare, 4.516c.

Toronto Ry.—A quarterly dividend at the rate of 8% per annum, was paid, July 2.

Application is being made to the Ontario courts for the appointment of E. R. Wood as trustee for the bondholders under the deed of trust of Sept. 1, 1892, in succession to the late Hon. G. A. Cox.

The Toronto Ry. receipts for June were $525,533 compared with $512,086 for June, 1913. The aggregate receipts for six months ended June 30 were $3,035,301, against $2,893,843 for the same period, the increase for the half year being at the rate of 4.8%. The amount paid to the city as percentage on earnings for June was $105,106, against $102,417 in June, 1913.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for May $871,733; operating expenses, maintenance, etc., $449,627; net earnings $422,106, against $811,872 gross earnings, $418,415 operating expenses, maintenance, etc., $393,457 net earnings for May, 1913. Aggregate gross earnings for five months ended May 31, $4,163,988; net earnings, $1,994,879, against $3,840,280 aggregate gross earnings; $1,839,564 net earnings for same period 1913.

Toronto Suburban Ry.—The interest on the 4½% first mortgage debenture stock, for the half year, was paid July 15.

Winnipeg Electric Ry.—A dividend of 3% for the quarter ended June 30, was paid, July 2, on the fully paid capital stock.

Gross earnings for May $337,664; operating expenses $189,643; net earnings $148,021, against $326,827 gross earnings; $180,275 operating expenses; $146,552 net earnings, for May, 1913. Aggregate gross earnings for five months ended May 31, $1,756,539; net earnings $730,407, against $1,651,336 aggregate gross earnings; $729,221 net earnings, for same period 1913.

Electric Railway Notes.

The civic estimates of Calgary, Alberta, for this year include $863,000 for the municipal railway.

The London St. Ry. expects to order some more cars, but at the time of our recent advice it had not been decided how many, or whether they would be single or double truck.

The citizens of Brandon, Man., by an excess of 25 over the necessary two-thirds majority, voted recently in favor of the bylaw authorizing the operation of the Brandon Municipal Ry. on Sundays.

The British Columbia Electric Ry. has offered a reward of $1,000 for information which will lead to the arrest and conviction of those guilty of tampering with the switch on its electric line, June 13, which caused the derailment of a car.

The financial report of the city of Saskatoon, Sask., for the first three months of 1914 shows a deficit on the municipal railway operation of over $14,000, which more than wipes out the profits made by the civic light and power departments.

A proposition is under consideration in Calgary, Alberta, for the erection of a public utilities building, in which would be combined offices, recreation rooms for the employees of the municipal railway and other departments, and a public waiting room.

The Windsor, Ont., City Council is making application to the Ontario Railway and Municipal Board for an order to compel the Sandwich, Windsor and Amherstburg Ry. to install air brakes on its cars, and to provide the necessary equipment for keeping the tracks clear of snow during the winter.

F. Ganz, has been engaged by the Manitoba Public Utilities Commission, to make an investigation of electrolysis in Winnipeg, with the idea of preventing the destruction of the city's water mains, etc., by reason of their proximity to the Winnipeg Electric Ry. lines.

A newspaper paragraph calls attention to the fact that on July 20, 1835, a public meeting was held in Quebec, for the purpose of furthering a project to build a railway from Portland, Me., to Quebec City. This was the beginning of the movement which led to the building of the G. T. R.

The Port Arthur, Ont., City Council has arranged for the P. A. Electric Ry. (which it owns) to haul the city garbage from two central points to the city dumps. A special car will be used for the purpose. An account will be kept of the cost, in order to see the saving made over the present system of having the work done by teams.

The Toronto Board of Control instructed the Commissioner of Works recently to prepare a report on a proposal for an interchange of passengers on the basis of a 5c. fare, between the municipal lines and the Toronto Ry. The Commissioner's report only showed a prospective saving of about $6,000 a year.

The Sudbury and Copper Cliff Suburban Ry., we are officially advised, has not decided as to its power plant and car equipment requirements, but the following are proposed: On Copper Cliff route, 1,200 volts d. c.; in center of town, 600 volts d. c.; two small interurban cars; one city car; combination snow plow, work car and tank car; combination freight and express car.

The Haileybury, Ont., Board of Trade is asking for a reduction of fare on the Nipissing Central Ry., between Haileybury and Cobalt, from 10c. to 5c., and for the substitution of a 15 minute for a half hourly service. The management had arranged to alter the car schedule to a 15 minute one some time before the meeting was held, and the schedule was put in operation July 8 the day following the meeting.

The Calgary Municipal Ry. has received from the Preston Car and Coach Co. 1 street sprinkler, 5,000 galls. capacity, mounted on G.E. 2 trucks, rolled steel wheels, Westinghouse 101B2 electrical equipment, double end control, adjustable sprinkler heads at all four corners, direct connected electric centrifugal pump arranged so that it can be used as a fire engine or filled from a hydrant with city pressure, or can fill itself from a reservoir.

The Saskatoon, Sask., City Council has authorized a schedule of places at which the street cars will stop to take on and let off passengers. The regulation came into operation July 1. The City Council, July 7, authorized the motormen to stop cars where necessary pending further consideration of the orders to stop cars only at certain points, put in force July 1. It is not intended to revoke the order, but to give the motormen discretionary power to stop at other than the points mentioned in the order until the people get accustomed to the fixed stopping places.

Calgary Municipal Railway's Finances.

City Commissioner Graves of Calgary, Alberta, is reported as estimating that the Calgary Municipal Railway will have a heavy deficit this year, which may amount to $50,000. The reasons given are general trade depression and a large increase in interest charges on account of extension work carried out. It is also stated that Calgary pays about the highest wages in any Canadian city.

In reply to an enquiry as to the correctness of the report given above, Commissioner Graves has written Canadian Railway and Marine World as follows:—"It is premature to give an estimate of the financial position of the street railway, as there are six months nearly to run before the close of the fiscal year. Receipts have been falling off very largely since the beginning of the fiscal year, but this was undoubtedly due to the financial depression existing all over the country. There has been considerable improvement this last month, but whether this will continue or not it is impossible for me to predict. This year the city has changed its policy in respect to setting aside depreciation account. Formerly 5% of the gross earnings was set aside for depreciation and contingencies. (This, by the way, was over and above interest and sinking fund charges). We are now providing an average of 5% on the gross capitalization of the railway for depreciation, also 2% of the gross earnings for repairs to the permanent pavements along which tracks are laid. You will see that the city has gone to the other extreme in providing this depreciation and obsolescent fund. The above will explain any deficit that there may be during this year. I would, however, point out that there is a surplus of $200,000 standing to the credit of the street railway."

Wood Preservatives Used in 1913 by 93 wood preserving plants in the United States amounted to the following quantities: Over 108,000,000 gal. of creosote oil, 26,000,000 lb. dry zinc chloride, and nearly 4,000,000 gal. of other liquid preservatives. Over 153,000,000 cu. ft. of timber were treated by these plants, or about 23% more than in 1912. These are the figures given by the American Wood Preservers' Association in cooperation with the Department of Agriculture's Forest Service. The report goes on to say that while in Great Britain and most of the European countries, practically all railway ties and telephone or telegraph poles receive preservative treatment, in the U. S. less than 30% of the 135,000,000 cross-ties annually consumed are treated, and that the proper treatment of an annual consumption of 4,000,000 poles may be said to have scarcely commenced.

Ottawa Electric Railway Wages.—As a result of conferences held recently between the company's management and the employes, the award of the Board of Conciliation made in June, 1912, is to be continued for two years from July 1, except that the 1st and 2nd year car men receive 1¼c. an hour increase, and those in the 3rd year of service and upwards 2c. increase. This makes the present rates: First year service, 23c., 2nd year 24c., 3rd year and thereafter, 27c., Sunday work 2c. an hour extra. Increases have also been granted in the company's other departments. The rules and conditions of work which have been in force for the past two years are continued.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford St. Ry.—Grand Valley Ry.—Under authority of an act passed at the Ontario Legislature's last session, the Brantford City Council has appointed a Commission of three to manage these lines until a Commission can be elected by the ratepayers at the municipal elections next January. The Commission consists of C. H. Hartmann, Chairman; W. R. Turnbull, and A. K. Bunnell, City Treasurer, the latter acting as Secretary temporarily. Applications have been received for the position of Manager, but up to the date of our official advice no action had been taken, and as the property was then still in the receiver's hands, pending completion of certain legal proceedings, the Commission had not settled on any policy. It has power to order cars and improve the roadways, up to the amount voted by the ratepayers, $140,000. The meeting of bondholders which was called for July 15 was postponed to Sept. 16, it being stated that the city council would not have completed its search into the titles of the several properties in time to have the transfer ready for signing on the first named date.

British Columbia Electric Ry.—Work is in progress on the erection of the new car barns at Fourteenth Ave. and Main St., Vancouver.

The Victoria City Council is discussing with the company's officials the question of paving between the rails. Up to the present the company has been doing a certain portion of the work; then the City Engineer's department has laid the base for the pavement, the work being completed by the company. It is suggested by the City Engineer that an arrangement be made by which the company will do the whole of the work.

Plans are reported to be in preparation for the laying out of a recreation park on the recently opened Saanich line on Vancouver Island. (July, pg. 335.)

Berlin and Northern Ry.—A press report states that grading has been started on a half mile extension in Berlin, Ont.

Calgary Municipal Ry.—A bylaw authorizing the expenditure of $90,000 for street railway subbase on certain streets, has been approved by the ratepayers, also one to provide $300,000 for the extension of the electric light and power plant. These bylaws did not receive the necessary two-thirds majority when submitted May 1, and were voted on a second time June 27.

Dartmouth and Cow Bay Electric Ry.—The Nova Scotia Legislature has granted an extension of time for the building of this projected railway from Dartmouth to Cow Bay Beach, Halifax County.

Dunnville, Wellandport and Beamsville Electric Ry.—A resolution has been passed by the Clinton Township Council, asking the Hydro Electric Power Commission of Ontario to take over this uncompleted line, and incorporate it with a general system of lines to be built under the Commission's auspices. (June, pg. 283.)

Fort William Electric Ry.—The installation of the double diamond across the Canadian Northern Ry. on Victoria Ave., Fort William, Ont., is reported completed. It is proposed to build a double track line on Victoria Ave. as far west as Franklin St., and a single track from Franklin St. south to Walsh St. A correspondent writes:—Street Railway extension work for the past two months has been carried on very rapidly, and the extensions are almost ready to be turned over to the operating department. The finishing up has been delayed through waiting for special parts for crossings, switches, etc.

The Grand Falls Ry. Co. was incorporated last session of the New Brunswick Legislature with power among other things to build an electric railway from Grand Falls to the International boundary at Limestone Tp., Maine, and to grant running powers over the same to other companies; to build electric railway lines in the town of Grand Falls, and along roads and public highways in the Counties of Victoria and Madawaska, N. B. The capital stock is fixed at $49,900, and the head office at Grand Falls. Bonds for $25,000 a mile may be issued. The provisional directors are:—W. Pirie, D. Gillespie, J. J. Cote, C. A. Kirkpatrick, H. S. Henderson, E. R. Teed, J. S. Eagles, J. W. Hall, J. M. Stevens, A. Lawson. (See Grand Falls to Limestone, May, pg. 231.)

The Hamilton St. Ry. is being asked by the Hamilton, Ont., City Council's Street Railway Committee to relay the tracks on York St., at once. (July, pg. 335.)

Lethbridge Municipal Ry.—The ratepayers of Lethbridge, Alta., on July 2 gave a majority against bylaws providing $22,666 for extensions at the electric power house; $12,834 for power line extensions, and $3,691 for extensions of the street railway. The bylaws are to be again submitted to a vote on Aug. 4. (May, pg. 231.)

Medicine Hat, Alta.—We are officially advised that the City Council of Medicine Hat, Alberta, is only discussing tentatively the electrification of the Ansley coal mine spur line, and that no definite action has been taken. The spur is 3.5 miles long. (July, pg. 335.)

Moncton Tramways, Electricity and Gas Co.—E. B. Reeser, Vice President, Pittsburg, Pa., is reported to have stated on a recent trip to Moncton, N. B., that he was not in a position to make any definite announcements regarding any proposed extensions of the company's lines. (May, pg. 231.)

Montreal and Southern Counties Ry.—The Montreal City Council passed a resolution, July 4, authorizing the company to extend its rails across McGill St., by way of Youville St., and thence up the wider part of St. Peter St. to Youville Square to a Y, and back again. The company has been endeavoring for some years to secure this concession so as to give it a better city terminal. (July, pg. 283.)

Montreal Tramways Co.—The Montreal City Council passed a resolution, July 7, calling on the company to build a double track line on Bernard St., between St. Lawrence and Park avenues, and to give further access to Mile End station. There is a question as to whether the cost of this work should be borne by the company or the city, but the council expressed a desire to have the work done, reserving the rights of both parties. The paving of the street is being held up until the tracks are laid.

The question of the improvement of the lines in the city was taken up by the City Council July 7, when consideration was given to a report of G. R. McLeod, the city's railway engineer, which recommended that the Park Ave. line be extended to Chemin Cremazie and the C.P.R. tracks in Bordeaux ward; that a new line be built from the corner of Musson St. and Ninth Ave. to Piux IX. Boulevard, Longue Pointe ward; that the line on St. Patrick St., Anne ward, be extended from Atwater Ave. and link up with the line on Church Ave., Cote St. Paul; and that the Montreal Park and Island Ry. be so changed as to run to the C.P.R. tracks, continuing to Cote des Neiges ward. The situation is a very complicated one, as it would appear from statements made in the press that there are two or three sections in the council, each having its own particular plan for the settlement of the whole tramway question. The suggestions made by Mr. McLeod, it is claimed, will supply the pressing needs of certain outlying districts, and render the solution of the problems of the centre of the city somewhat less difficult.

It is reported that it is proposed to grant the company either a 30 or a 40 year franchise, the company to charge a straight 5c fare, with workmen's tickets during limited hours, and that the payments to the city will be on a lesser scale than those now made. (July, pg. 335.)

It is said that no definite action will be taken in reference to the granting of a new franchise, until the autumn.

Nelson St. Ry.—Press reports state that the Nelson, B. C., City Council is considering plans for bettering and extending the electric railway lines in the city. A. S. Horswell is chairman of the Street Railway committee, and F. C. Ingram is Superintendent of the railway.

Nipissing Central Ry.—The electrification of the Kerr Lake branch of the Timiskaming and Northern Ontario Ry. is reported completed, and it was expected that a regular car service would be put in operation over it by the N. C. Ry. July 31. (June, pg. 283.)

Nova Scotia Tramways and Power Co.—The Nova Scotia Legislature has incorporated a company with this title with power to construct, purchase, lease or otherwise acquire tramways and street railways in Nova Scotia; to develop electrical power and distribute the same for lighting, heating or other purposes; to acquire steam and other vessels to be used in connection with the company's undertaking only; and other purposes incidental thereto. The capital stock is fixed at $6,000,000, with power to increase to $10,000,000, and the company office is to be in Halifax. The company is authorized to purchase the rights, franchises, etc., of the Halifax Electric Tramway Co., which company is authorized to sell to the N. S. T. and P. Co. This sale is to be made subject to all agreements made with the City of Halifax, and "subject to any rights, claims, privileges and easements which may be held or enjoyed against the said company or its successors however arising." It is also set out that the amount to be paid to the City of Halifax in future shall in no year be less than that paid in 1913; that the rates to be charged for electric light and power shall not exceed those at present charged; the fares on the electric railway shall not be increased; that within three months after acquiring the property, workmen's tickets at the rate of 8 for 25 cents, shall be sold, subject to terms and conditions approved by the Board of Commissioners of Public Utilities. The company is declared to be subject to the Public Utilities Act of 1913, and must start developing one of its water powers within two years, and spend $500,000 thereon within a further period of two years from the passing of the act. The provisional directors are:—E. A. Robert, Hon. N. Curry, J. W. McConnell, W. G. Ross, F. H. Wilson, Hon. J. M. Wilson, H. A. Lovett, Montreal; Sir F. Borden, Canning, N. S.; E. N. Rhodes, Amherst, N. S.; O. E. Smith, J. E. Wood, W. M. P. Webster, H. H. Smith, J. A. Neville, Halifax, N.S.; R. J. McIntosh, New York.

Press reports state that an appeal is being made to the Dominion Government to disallow the act. (June, pg. 283.)

Ottawa Electric Ry.—The City Council is

preparing plans for a low level lift span bridge across the Rideau Canal from Pretoria Ave. to Ottawa East, at an estimated cost of $120,000, towards which the City will pay $80,000 and the Dominion Government $40,000. The O. E. Ry. is interested in the matter as it is desired to extend its line across the bridge. Up to the present the company has declined to consider running its cars over a low level bridge, preferring a high level one. (July, pg. 335.)

Sandwich, Windsor and Amherstburg Ry.—Judgment was given in Toronto, July 1, in the action brought by Alderman F. Mitchell, on behalf of himself and other property owners, to secure an order to prevent the company building what is known as the Ferry Ave. spur. The court granted the order applied for, and left the matter of damages to be fixed by the local master. The ground for the action arose from the fact that the company began work on the spur line before the City Council had passed the bylaw, which has not yet been submitted for approval to the ratepayers. The order directs the company to restore the street to the condition it was before work was started and to pay the costs of the action. It is likely that there will he an appeal against the decision.

The rail joints on certain of the lines and intersections in Windsor are being welded.

The Sandwich Town Council has refused to allow the company to build a second track on a section of Bedford St. The company proposes to carry its application to the Ontario Railway and Municipal Board. (June, pg. 283.)

Simcoe Ry. and Power Co.—A press report states that the rights, franchises and property of this company have been acquired by the Hydro Electric Power Commission of Ontario. The company owns a power plant from which power is distributed in Midland, Ont., and neighborhood. It has authority to build electric railways in the same district, but has not taken any steps to secure the necessary franchises.

Sudbury and Copper Cliff Suburban Electric Ry.—We are advised that the only route upon which surveys have been completed is that to Copper Cliff, 5.1 miles. On this line the maximum gradient will be 4%; the curves will be as follows:—one each 50 ft. radius, 205 ft. radius; 5 degrees, 10 degrees, 12 degrees, 20 degrees, 30 degrees; two of 15 degrees, and a few from 1.30 to two degrees. The culverts are to be of corrugated iron pipe, and there will be the following bridge construction:—Two small deck culverts, two single span trestle bridges, and one three span trestle bridge. The present work is heing done principally by day labor, under the direction of C. D. Norton, Engineer. A small amount of station work has been let, and the paving in the town is being done by the Warren Bituminous Paving Co. Two miles of grading have been completed. On the 0.43 mile in Sudbury, where a permanent pavement is being laid, the ties will be laid on a 6 in. concrete base, filled in between with concrete. The track will be laid with 80 lb. rails.

Following are the provisional directors:—L. LaForest, Chairman; C. McCrea, M. L. A., Solicitor; C. D. Norton, Engineer; W. J. Bell, W. C. Cochrane, D. M. Morin, J. J. Mackey.

Three Rivers Traction Co.—We are officially advised that the company has not yet started construction on its projected electric railway. The contract with the City of Three Rivers, Que., has not been signed, but it is expected that everything will be in order to enable construction to be started during this month. (July, pg. 336.)

Toronto and York Radial Ry.—The Toronto City Council proposes to grant permission to the company to connect its Mimico division with the city system, at Sunnyside. The city now owns the line from Sunnyside to the Humber River, but it is still operated by the T. and Y.R. Ry. The city proposes to connect this piece of line along the Lake Shore road, and across the hridge at the Sunnyside station of the G. T. R., and to grant permission for the running of the Lake Shore Division cars over it.

Toronto Suburban Ry.—An agreement has been reached between the Weston Village Council and the company, by which the tracks on Main St. will be moved from the side to the centre of the road. This matter has been under consideration for two or three years. The question of building a new bridge across the ravine, to the north of the village, is under consideration, and it is not improbable that the company will build a bridge for its own use.

The Board of Railway Commissioners, on July 14, deferred giving judgment on the company's application, pending submission of details on present and prospective traffic over the road.

It is reported that the difficulties which have prevented the completion of the extension to Woodbridge have been smoothed out, and that the line is to be completed and opened this summer.

A press report states that surveys have been made for a line from the Weston-Woodbridge line to a junction with the Lambton-Guelph line, passing through Brampton. An official of the company states that several routes have been surveyed to give this connection, and although there have been certain negotiations with Brampton, nothing has been decided, and the matter is likely to stand over for some time yet.

Track is reported laid from Islington to the boundary of Georgetown on the Lambton-Guelph line, and the bridge work is being progressed with. The line is being built westward, but nothing is being done between Lambton and Islington. (July, pg. 336.)

Transcona, Man.—Tenders are being invited for the building of the line in Transcona, the route of which was given in our June issue on pg. 284. It is expected to start construction during August. J. H. Kern has the franchise. (July, pg. 336.)

Winnipeg Electric Ry.—The Manitoba Public Utilities Commission has directed the company to prepare plans for the immediate laying of a second track through the St. James subway.

The Winnipeg Board of Works has approved of plans for the laying of a second track on Notre Dame Ave. west, to provide a new loop with Notre Dame, Keewatin and Logan avenues.

The company has informed the Winnipeg Board of Control that it is not prepared to lay permanent tracks on Mountain Ave., or in Elmwood, this year.

The company has prepared new plans for building a second track on Sargent Ave., and is asking the City Council to approve of them. (July, pg. 336.)

Omnibus Service for Stratford.—The Stratford, Ont., City Council granted a franchise, July 8, for the operation of an electric bus service in the city. Three vehicles, each having seating room for 14 passengers, give a half hourly service, at a 5c. fare, between 6 a.m. and 11 p.m. The service was to begin July 25, and the franchise is to terminate upon the construction of an electric railway in the city.

Winnipeg Electric Railway Traffic Supervision.

We have been favored with the following communication:—

"The street railway problem in Winnipeg had reached such proportions that the city council felt that the interests of the citizens from a transportation standpoint should be supervised from the City Hall, in order to attain the best results. In March, 1913, application was made to the Public Utilities Commissioner, H. A. Robson, for an investigation into the street railway transportation in the city, and accordingly R. M. Feustel, Chief Engineer, Public Utilities Commission, Springfield, Ill., was appointed as investigator. A comprehensive survey of the whole system was made and the report was completed and sent to the city council in Oct., 1913. The recommendations made by Mr. Feustel were considered and passed, and R. P. Lewis was appointed as Traffic Supervisor, to carry out the details of the report. Mr. Lewis has had an extensive railway experience in Western Canada, and, during the investigation referred to, was in active charge of the staff obtaining the data.

"Since the institution of the office of Traffic Supervisor many changes have been made in the transportation situation, one of the most important being the rerouting of the cars throughout the city. It is estimated that this rerouting has reduced the amount of transferring by about 35%, besides carrying the passengers to and from their work at a considerable saving of time on most of the lines. A start has been made on p-a-y-e style of cars, and three of the most important city lines have already been equipped. It is expected that the whole system will be equipped by the end of the year. The question of elimination of certain stops is under consideration, and it is expected that a start will be made in this reform at an early date.

"For the relief of the present single track St. James subway on Portage Ave., a loop is being constructed at Portage and Clifton Sts., and a service will be established from that point along Portage Ave. and Main St. to the C. P. R. station, which will supply a much needed service. In this connection the Public Utilities Commissioner has ordered the Winnipeg Electric Co. to file plans with the city council for double tracking the present subway, for the proper handling of the car service at this point."

British Columbia Electric Ry. Wins Appeal in England.—A London, Eng. cablegram of June 26 said:—"The Privy Council delivered judgment today in the British Columbia Electric Ry. versus Vancouver, Victoria and Eastern Railway and Navigation Co. The issue was as to whether the Board of Railway Commissioners had jurisdiction to direct the appellants to pay part of the cost of bridges over certain Vancouver streets. The Privy Council, in allowing the appeal, said that if the Board possessed any such jurisdiction it must be derived from the statute which created it. The fundamental error underlying the decision of the Board was that they have considered that the fact that the British Columbia Electric Ry. would be benefitted by the works gave the Board jurisdiction to make the railway pay the cost, or portion thereof There is nothing in the Railway Act which gives any such jurisdiction."

W. S. Ousman, Canadian Freight Association, Montreal, writes: "I always look forward to the receipt of Canadian Railway and Marine World, as I find it not only interesting but helpful, and do not care to miss a copy."

St. John Railway Employes' Strike.

A St. John, N.B., dispatch of July 22, says: "About 100 members of the local street railway men's union are on strike because of matters arising out of the dismissal of a conductor for alleged breach of the rules. They did not report for work this morning, following a decision reached after an all night meeting. A few cars are running, and in one section busses are being operated by friends of the men."

In an interview given to the local press, just prior to the strike, H. M. Hopper, General Manager, St. John Ry., stated that conductor F. Ramsay was dismissed for a breach of the company's bylaws, and in response to an application made on his behalf a board of conciliation was appointed to enquire into the circumstances. Its finding was to the effect that owing to conflicting evidence it was difficult to arrive at a conclusion, but taking all the evidence into consideration, and in view of the conditions existing, the directors' action was properly taken to support the authority of the General Manager to preserve discipline, for the best interests of the public, and with due regard to the public safety.

Mr. Hopper pointed out that it is a serious breach of the company's rules, which are standard with all railway companies in the Dominion, for a conductor to leave a car when on duty, and to allow the car to proceed without him, as was the case with the man concerned. The board's finding also recommended that the company find some employment for the man, and also practically recommended that the company should recognize the Amalgamated Association of Street and Electric Railway Employes of America. On July 17 four conductors and four motormen were dismissed for not obeying the law which requires street cars to come to a full stop before taking a steam railway crossing, the conductor to go ahead and signal the car across. Frequent reports have been made of violation of this law by conductors and motormen, and the attention of the men has been specifically and frequently drawn to the matter, but it was still violated, especially by men belonging to the union. Very special attention was called to the law during the first week in July, and it is concluded that the men dismissed deliberately and wilfully broke the law. The other men who have been dismissed were dismissed for carrying passengers free. Mr. Hopper stated that until the advent of the union's agent the relations between the company and its employes were most amicable, and any complaints or grievances which the men had to make were dealt with by the board and a committee of the men. The present question resolves itself into one where the union wants to take control of the management of the company's business, in other words, the whole discipline of the men would be under the officers of the union.

The strike was reported to have been settled, July 24, by the signing of an agreement, the company consenting to reinstate at once, nine of the men dismissed, two cases being taken under consideration, F. Ramsay, the conductor, about whom the strike originated, not being reinstated. This conductor is president of the local employes' union.

Personal Paragraphs.

E. R. WOOD has been appointed a trustee for bondholders of Toronto Ry. Co., in place of the late Hon. G. A. Cox.

A. M. NANTON, a director of the Winnipeg Electric Ry., has been elected Vice President, and G. V. HASTINGS has been elected a director, to fill vacancies caused by Sir William Whyte's death.

E. J. CHAMBERLIN, President, G.T.R. and G.T.P.R., has also been elected President, Montreal and Southern Counties Ry., succeeding the late W. Wainwright.

FRANK SCOTT, Treasurer, G.T.R., and heretofore Treasurer, Montreal and Southern Counties Ry., has been appointed Vice President and Treasurer, M. & S. C. R.

The Brantford, Ont., City Council has appointed C. F. Hartman, W. R. Turnbull, and A. K. Bunnell, City Treasurer, Commissioners to operate the Brantford St. Ry., and the Grand Valley Ry., which it has acquired, until January next, when the ratepayers will elect a Commission. C. F. Hartman is Chairman, and A. K. Bunnell is acting as Secretary, temporarily.

G. GORDON GALE, who has been appointed General Manager, Hull Electric Co., Hull, Que., and whose portrait appears on this page, was, prior to 1907, Assistant Engineer, Canadian Rubber Co.'s electrical plant; from 1907 to Nov., 1908, Superintendent of Power, Hull Electric Co.; Nov., 1908, to 1909, acting General Superintendent,

P244 G. Gordon Gale,
General Manager, Hull Electric Company.

same company; 1909 to June, 1914, General Superintendent, same company. He is a graduate of McGill University and an associate member of the Institute of Electrical Engineers, and of the Canadian Society of Civil Engineers.

J. B. RANNIE, Traffic Agent, British Columbia Electric Ry., Vancouver, who has been connected with the company's Vancouver city service for nearly 25 years, resigned, July 1, in order to farm a ranch he has recently purchased near Chilliwack. He entered the company's service in Sept., 1889, and was engaged on the reconstruction of a number of cars which had been purchased with the view of operating the street railway with horses, later plans providing for electrical operation. He later served as conductor and motorman. At this time, the Vancouver city lines consisted of about two miles of main line and a short spur of half a mile. During the period he was with the company, the Vancouver city lines were extended to nearly 100 miles of single track. He served as motorman until 1900, when he was appointed Traffic Superintendent, Vancouver Lines, and in 1911 was appointed Traffic Agent, Vancouver Lines, which position he has held until his resignation. Prior to leaving Vancouver, the car men presented him with a gold watch and chain, and Mrs. Rannie with a cameo brooch, while the office staff gave him a case of household cutlery.

Automobiles Passing Standing Electric Cars.

W. Gibbs, of Brantford, and A. E. Ratz, of Tavistock, were charged, at Ingersoll, Ont., July 18, by Constable Scurrah, of Beachville, Ont., with driving their automobile past an electric car in that village while it was standing to embark and disembark passengers. Magistrate Patterson, dismissed the cases, holding that the requirement that automobiles do not pass standing electric cars only applies to street railways in a city or town, or within a mile and a half of urban limits, and not to interurban lines.

The Act to amend the Motor Vehicles Act, passed by the Ontario Legislature in 1913 provides in Chap. 52, sec. 4, that

"When a motor vehicle meets or overtakes a street car which is stationary for the purpose of taking on or discharging passengers, the motor vehicle shall not pass the car on the side on which passengers are getting on or off until the said passengers have got on or got safely to the side of the street as the case may be."

The Ontario Railway Act, 1913, chap. 36, sec. 2, sub sec. u provides that:—

" 'Street railway' shall mean a railway constructed or operated along and upon a highway under an agreement with or bylaw of a city or town, although it may at some point or points deviate from the highway to a right of way owned by the company under the powers conferred by sec. 243, and shall include all portions of the railway within the city or town and for a distance of not more than 1½ miles beyond the limits thereof, although such 1½ miles may be constructed under a bylaw or agreement with a municipal corporation other than that of such city or town, and shall also include any part of an electric railway which lies within the limits of a city or town and is constructed or operated along or upon a highway."

Under the last section above quoted the magistrate held that when the electric car was in Beachville it was not a "street car."

Ontario West Shore Railway Offered for Sale.

This uncompleted line, which was promoted by J. W. Moyes, of Toronto, who is now "absent" from the country, is offered for sale by the Trustee, Thos. Stothers, Dungannon, Ont., tenders to be received to Aug. 15. The property consists of the railway franchise, extending from Goderich to Kincardine, and covering other territory in the counties of Huron, Bruce, Grey, Lambton and Middlesex. The road is built from the C.P.R. crossing, close to Goderich, to Kintail. Grading has also been done from Kintail to Pine River. The distance constructed and on which ties and rails are laid is about 14½ miles. The material on hand consists of a locomotive, bridge material, rails, bolts, spikes, ties, posts, etc. The tenderer is to enter into a contract with the trustee for the completion of the road and making same into a running concern between Goderich and Kincardine within a time and on conditions to be agreed upon with the trustee. The tenderer to deposit with the trustee a marked cheque covering 5% of the amount of his tender, and be prepared to give a bond for the carrying out of his contract.

The Regina Municipal management does not expect to place any orders for rolling stock this year.

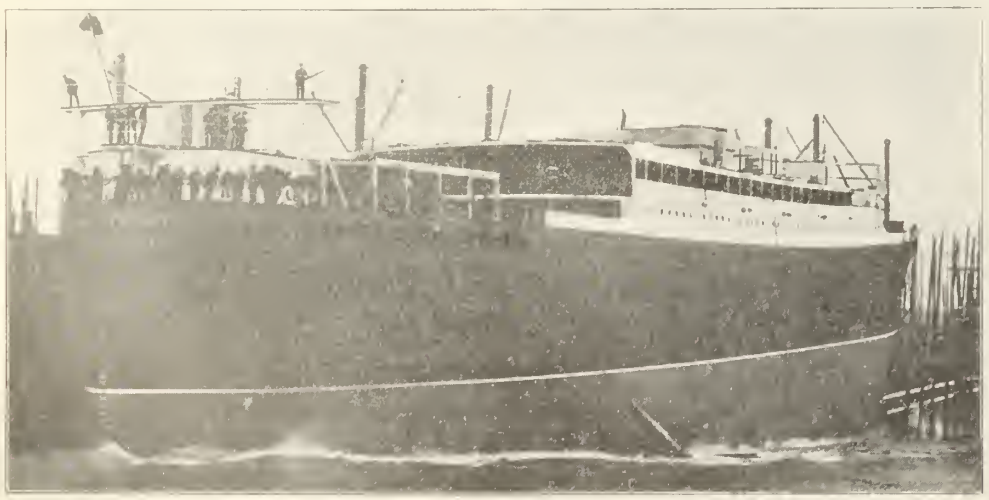
Marine Department

The Launching of the s.s. Missanabie for the Canadian Pacific Railway.

As announced in Canadian Railway and Marine World for July the twin screw steamship Missanabie, which is being built for the C.P.R.'s service between Canada and Liverpool, was launched at Glasgow, June 22, and christened by Mrs. G. McL. Brown, wife of the European Manager, C.P.R.

The Missanabie's length is 620 ft., breadth 64 ft., depth 41 ft., gross tonnage 13,000 tons, displacement 18,000 tons, cargo capacity 400,000 cu. ft. Below the level of the main deck the space is devoted to general cargo, three of the lower 'tween decks are fitted for the carriage of refrigerated merchandise. From the main deck upwards through six separate decks, the entire space is devoted to passengers, viz., cabin, 520; third class, 1,200; crew, 300; total, 2,020. On the main or F deck, which is the lowest passenger deck, all the accommodation is portable, and can be removed at very short notice, a large commissariat department, extending the full width of the ship, provides cold storage for the more perishable table supplies. On the upper or E deck are the dining saloons, the main saloon being forward, and the third class, which is in duplicate, placed aft. Between the two saloons the entire space amidship is occupied by the culinary department, with its attendant auxiliaries, the remainder of the deck space is taken up by third class living rooms. The shelter or D deck contains an overflow third class dining saloon, the fittings of which are portable, and when not in use can be used as recreation space, while at the aft end is a ladies' room for third class. Following in due order is the lower promenade or C deck, at the extreme aft end are the third class entrance, smoking room and hospitals, at the forward end is another entrance house for third class, while abundant promenade space for this class is provided adjacent to these houses. The midship area is entirely occupied by cabin passengers in two, three, and four berth rooms. Immediately above on the upper promenade or B deck is the cabin smoking room with cafe verandah at aft end and card room adjoining. Amidships is the drawing room and the lounge at forward end. The drawing room and lounge having bay windows with recessed seats. On the boat or A deck, entering from the upper promenade deck, is the gymnasium. At forward end is the Marconi installation, and a house containing the emergency dynamo, the latter entirely independent of the main propelling machinery, so that in the event of any necessity arising an uninterrupted supply of light and power is ensured for the Marconi installation, the handling of the small boats mechanically and the ship generally. The boat deck is entirely set aside for the storage and working of boats, of which 32 boats are carried, one being a motor lifeboat. The majority of the boats are in nests of two and three, and the davits in this case have a mechanical contrivance which enables them to be launched though the vessel may have a considerable list. In addition, two sets of Babcock and Wilcox patent davits are fitted, which, in conjunction with a tramway, render it possible to launch the lifeboats from either side of the ship. There are no collapsible lifeboats on board, all being rigid open lifeboats. The heating and ventilating system is a dual one, consisting of two distinct methods, whereby every space on board is ensured of a sufficiency of heat and fresh air. There is a thermo tank system supplying heated air, and capable of maintaining an even temperature of 65 deg. Fahr. even in the coldest weather, and a combined system of steam heating and warmed air; this system is really subdivided into two separate and distinct methods used in collaboration. The first subdivision makes use of live or exhaust steam at a pressure not exceeding 5 lbs. per sq. in., uniform circulation being maintained by means of a vacuum at the exhaust end of the system. A complete range of piping is fitted, with radiators at convenient points, each apartment having an individual control valve. The second subdivision is again divided into two independent methods, viz., a warm air inlet and an extraction plant. Each system is capable of providing an air change of 1,000 cu. ft. per occupant hour in living rooms, eight changes per hour in dining saloons, and 60 changes per hour in galley space.

The Steamship Missanabie after launching.



Launching the Steamship Missanabie.

The electric lighting system comprises over 1,300 lights, special attention being paid to the lighting of the boat positions. The electric power supply comprises fans, lifts, barbers' equipment, printing, submarine signalling, and galley outfits. The generating plant consists of three sets of turbines coupled to d.c generators, the output of each set being 100 k.w. at 100 volts All watertight bulkhead doors are electrically operated, and can be closed simultaneously from the bridge.

The vessel is fitted with the cruiser stern, which the builders claim gives increased capacity, speed, and deck area; and the vessel is so divided by watertight decks and bulkheads that she is claimed to be capable of floating with any three compartments open to the sea. The cargo handling arrangements include three derricks and two powerful winches to each hatch, and in addition at no. 2 hatch there is a lattice girder heavy derrick capable of dealing with weights up to 25 tons. Steam steering gear is fitted on the lower deck well below the waterline, with reverse gear also operated by steam. The propelling machinery consists of twin sets of quadruple expansion engines balanced; steam is supplied by eight single-ended boilers at a pressure of 215 lbs., which it is anticipated will give the vessel a sea speed of 16 knots on service. Although carrying cargo the vessel is primarily designed for the conveyance of passengers.

The vessel has been built under the personal supervision of H. Maitland Kersey, Manager in Chief of Ocean Services, C.P.R., and his staff, by Barclay, Curle & Co.

The Empress of Ireland Disaster Investigation.

The enquiry into the causes of the collision between the C.P.R. s.s. Empress of Ireland and the s.s. Storstad, under charter to the Dominion Coal Co., May 28, in the St. Lawrence, near Father Point, was concluded at Quebec early in July, and judgment was delivered July 13. The evidence given during the enquiry and the judgment have been fully reported in the daily press. The main points of the judgment are summarized as follows:—

The question as to who, if anyone, is to blame for the collision in this case depends largely on which of the two stories put forward by the owners of the vessels is to be accepted. The main difference between the two stories is in the description of the way in which the vessels were approaching each other at the time the Empress of Ireland changed her course after having obtained an offing from Father Point. The Storstad witnesses stated that they were approaching so as to pass red to red, while those from the Empress stated that they were approaching so as to pass green to green. The stories are irreconcilable, and it was left to determine which was the more probable. During the enquiry the captain of the Empress of Ireland and the chief officer of the Storstad, who was in charge of the navigation of the latter vessel at the time, were asked to mark on a chart the place where they thought the collision occurred. Though they were in reasonable agreement, they were both wrong. From the time of the Empress of Ireland leaving Father Point, and sighting the Storstad, to the time when both vessels were enveloped in fog, though the bearings of the two vessels are matter for uncertainty, according to evidence, both sides agree that their relative positions did not involve any risk of collision, if each kept her course, therefore the question resolved itself into the comparatively simple issue as to which of the vessels changed her course during the fog. In dealing with the Empress of Ireland, no witness spoke of having seen her make any change of course, and those engaged in her navigation denied that any change was made, and the court's opinion was that there was no ground for saying that the course of the Empress of Ireland was ever changed, in the sense that the wheel was wilfully moved, but as the hearing proceeded another explanation was propounded, namely, that the vessel changed her course in consequence of some uncontrollable movement which was accounted for at one time on the hypothesis that the telemotor steering gear was out of order, and at another, by the theory that having regard to the fulness of the vessel's stern the area of the rudder was insufficient. The evidence called in support of the first named theory was considered unsatisfactory, so much so that the court decided that it could not rely on the testimony of one of the witnesses, Quartermaster Galway. The evidence of officers of the Empress of Ireland was to the effect that the steering gear was in perfect order and working well. On the subject of the area of the rudder, the court dismissed the matter from its consideration, as it was satisfied that on this point no real complaint could be made against the steering of the vessel. In commenting on the manoeuvre of the Empress of Ireland, before the vessels were enveloped in fog, when she reversed her engines, the court was of opinion that this was evidence of uneasiness on the part of the captain, and a consciousness that his vessel was possibly in too close proximity to the Storstad, and considers he would have been better advised if he had given her a wider berth, but does not think that his stopping, which was really done for greater caution, can be said to have been an unseamanlike act, nor considers his failure to give the wider berth as a contributory cause of the disaster.

Regarding the Storstad, it was admitted that those on board her did that which in ordinary circumstances would change her course, and did it in the fog shortly before the accident. It was claimed that what they did, namely, put the helm hard aport, in the fog, was an act of prudent navigation, done to counteract the effect of the current existing in the locality, and it was also claimed that by reason of this fact, and that the Storstad had little or no way on her, the porting had no effect on her course. The court could not accept this view, as it had been previously stated, on behalf of the chief officer, that the reason for porting the helm was to make sure of ample room, and from the character of the damage done to the Storstad's bow the court was satisfied that there must have been considerable way on the Storstad at the time she struck the Empress of Ireland. The evidence of the captain of the Empress of Ireland claimed that at the time of collision his vessel was dead in the water, with no way on her, and that no movement on her part contributed to the force of the impact. This the court considered doubtful, and that the captain was mistaken in supposing that the way had been entirely taken off his vessel, but the fact remains that the Storstad ported her helm and changed her course, and so brought about the collision. The explanation of the result is fairly clear. The chief officer of the Storstad believed, wrongly as it turned out, that the Empress of Ireland was passing his vessel red to red, and he wanted to make sure of ample room and ported to secure it. Unfortunately the Empress of Ireland was passing green to green, and so far from the porting securing more ample room, it brought the vessels into closer proximity, and then into collision.

Lord Mersey, President of the Court, in reading the judgment, said: "We regret to have to impute blame to anyone connected with this lamentable disaster, and we should not do so if we felt that any reasonable alternative was left to us. We can, however, come to no other conclusion than that Mr. Toftenes, chief officer of the s.s. Storstad, was wrong and negligent in altering his course in the fog as he undoubtedly did, and that he was wrong and negligent in keeping the navigation of the vessel in his own hands, and in failing to call the captain when he saw the fog was coming on. It is not to be supposed that this disaster was in any way attributable to the St. Lawrence waterway. It was a disaster which might have occurred in the Thames, in the Clyde, in the Mersey, or elsewhere in similar circumstances."

The report, which is very lengthy, details all the available information as to the sinking of the vessel, and the probable causes of its rapidity, and makes three main suggestions with a view to securing a possible greater safety for passengers at sea. It is suggested that all watertight doors and portholes be closed between sunset and sunrise; that vessels be fitted with rafts which will be released automatically as a vessel begins to sink, and that the taking up and dropping of pilots be carried out at different points. The report also states that there was no lack of discipline on the part of the crew of the Empress of Ireland, and that the Storstad crew did everything possible to save life and relieve suffering after the disaster. While there is no direct evidence, the opinion is held that some lives were lost when the port boats and other movables broke loose and crashed across the deck, and also that some injuries were sustained at the time of the actual collision. Praise was accorded to the Marconi operators both on the vessel and ashore.

Since the conclusion of the enquiry it is reported that the Minister of Marine has instructed Capt. H. St. G. Lindsay, General Superintendent of Pilots, to report on the question of taking up and dropping pilots at different points as suggested by the court.

Trust Certificates of Canada Steamship Lines, Limited

C. A. Barnard, K.C., General Counsel and a director of Canada Steamship Lines, Ltd., is reported to have stated recently regarding the disposition of the company's shares, that $12,000,000 par value of ordinary stock was issued to the vendors of the different companies now comprising Canada Steamship Lines, including the shareholders of the Richelieu and Ontario Navigation Co., Canada Interlake Line Ltd., Ontario and Quebec Navigation Co., and others, as also to the financial interests who placed the $6,300,000 bonds in London, and to the underwriters of the bonds. The holders of $6,255,000 par value of these ordinary shares came to the conclusion that it was in their interest, and also in the company's interest, to arrange for a permanent management of the company, and therefore pooled their shares by depositing them with the Royal Trust Co., under an agreement that the voting power of such shares would be vested for five years in the company's London advisory board, consisting of Sir Trevor Dawson, Sir Stephen Furness, Sir Vincent Caillard and A. Vickers. The owners of these pooled shares, received trust certificates against their shares, which entitle them to all the benefits of the shares, except the right to vote on them during the life of the trust, which is subject to termination at any time the London advisory board deems proper, during the five years. These trust certificates have been listed on the Toronto and Montreal exchanges, and will be listed also in London, so that holders will be able to deal with them as fully as with the shares.

Steamship Companies Responsibility for Loss or Damage to Passengers' Baggage.—In the case of C. G. Harston, Quebec, against Canadian Northern Steamships, Ltd., for $500 damage done to his effects when the s.s. Royal George stranded on the Isle of Orleans in Nov., 1912, judgment was delivered recently in favor of the plaintiff for the amount claimed. The contention that the conditions printed on the passengers' tickets, not having been complied with, precluded such a claim, and in any case that the damage was limited to £10, was overruled, it being held that the conditions on the ticket were not made known to the plaintiff and hence did not affect his rights. The maximum liability under the Canada Shipping Act is $500.

Dominion Wreck Commissioner.—Canada Gazette of July 11 announces the appointment of Capt. L. A. Demers, heretofore harbor master, Montreal, to be Wreck Commissioner, Department of Marine, vice Capt. H. St. George Lindsay, who has been appointed General Superintendent of Pilots at Quebec.

The Minister of Railways and Canals made a tour of inspection of the works in progress on the Welland Ship Canal in the middle of July.

Dominion Steel Corporation's Vessels for This Season.

The following vessels are being operated by the Dominion Steel Corporation (which includes the Dominion Coal Co.) during this season. The first column shows the names of the vessels, the second those of the captains, and the third those of the chief engineers:—

Alden	A. Holting	A. Lindejos
Batiscan	G. G. Green	E. R. Evans
Blackheath	M. H. Scott	A. J. Brewer
Cabot	Jas. Lintlop	R. Patterson
Cacouna	J. L. Newman	A. Stevenson
Corunna	J. A. McDonald	Jas. Downie
Coban	A. McPhail	R. A. Richards
Cape Breton	Jas. Kemp	S. A. Stevens
Easington	J. Stevensen	M. Robb
Fimreite	J. Mortensen	H. Amundsen
Fornebo	G. Maxfield	
Glendene	F. Corner	W. H. Watt
Heathcote	A. D. Muir	S. O. White
Felix	J. Johnsen	N. Nottosen
Hochelaga	W. G. Tudor	O. C. Shaw
Kamouraska	D. Morgan	W. P. Lowe
Kendal Castle	H. Harvey	W. Brown
Kronprins Olav	P. A. Nilsen	S. B. Olsen
Lingan	T. Garbutt	C. B. Smith
Louisburg	K. Marsters	G. G. Miller
Maskinonge	B. Griffith	C. K. Seddon
Monkshaven	J. E. Milburn	A. Wright
Morwenna	L. Holmes	John Scott
Nevada	F. A. Willett	S. E. Bonner
Stigstad	A. Larsen	J. Engeeretson
Sandefjord	K. Hansen	N. Jeros
Skogstad	G. E. Hansen	C. Hansen
Stiklestad	C. Lodrey	J. Granholt
Storstad	T. Andersen	Syveisten.
Wabana	D. Reside	J. E. Spedding
Wagama	J. Ostervold	O. Halsen

Responding to Signals for Opening of Bridges in Canals.

A largely signed petition from captains of vessels navigating through the Great Lakes and St. Lawrence Canals has been sent to the Minister of Public Works, representing that a continuous source of trouble and the cause of many casualties is the failure of bridge tenders to respond promptly to whistle signals blown by vessels in the canals requiring the opening of bridges. The regulations require the vessels to await the opening of a bridge, but in many cases on account of current in the canals, weather conditions, shelving or rocky banks, and lack of mooring facilities, it is impossible to let a vessel lose steerage way close to a bridge, without getting into difficulties and causing damage to the bridge or to the propeller, stering gear or hull of the vessel. The captains believe that a regulation requiring the signal of an approachng veissel to be answered from each bridge by whistle or by semaphore (lighted at night) would avoid a great deal of trouble by enabling them to hold back at safe distance, or to come on, as occasion might demand.

The Effect of the Loss of a Vessel on a Charter.

The Judicial Committee of the Imperial Privy Council recently gave a decision in the case of Bowring Bros. vs. Mumm, which clears up the point as to the liability of a charterer of a vessel, when the vessel is lost during the term for which she was chartered. The appeal was by Bowring Bros., St. John's, Nfld., against a decision of the courts, ordering a refund of $2,800, being the amount received for the charter of the s. s. Algerine for two months out of three, when she became a total loss on the conclusion of the first month. The appellants claimed that the vessel was chartered for three months, and the loss of the vessel prior to the completion of the charter, did not relieve the respondent from liability, even though the circumstances did not allow of his being advised of the loss of the vessel. The respondent claimed that the charter was a monthly one, for three months, and as evidence of this submitted that he paid the first month, and deposited two post dated cheques with a St. John's bank, for the second and third months, respectively, and also that the charter expired on the day the vessel was lost.

In delivering judgment, Lord Atkinson said that the only question in dispute was whether the vessel was chartered by the month, or for a definite period of three months. The court below had decided that it was a monthly hiring, and as the appellants had not been able to convince the Committee that that decision was wrong, the appeal was dismissed with costs.

The Georgian Bay Navigation Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital and office at Owen Sound, to acquire the Georgian Bay Navigation Co., and its steamship Soo City. This vessel will be operated during July and August between Owen Sound and Kings Royal Park, and week end trips from Owen Sound each Saturday, calling at Meaford, Parry Sound, Point au Baril and Byng Inlet. From the commencement of September to the close of navigation she will be run between Owen Sound, Meaford, Collingwood, Port McNicoll, Penetanguishene, Midland, Parry Sound, Depot Harbor, Point au Baril, Byng Inlet and French River. The Soo City was built at Benton, Mich., in 1889, and was formerly named Mabel Bradshaw. She is screw driven by engine of 34 n.h.p., and her dimensions are, length 135 ft., breadth 25 ft., depth 9 ft.; tonnage, 500 gross, 296 register. The officers and directors of the company, are,—President, Wm. Taylor, Owen Sound; Vice President, Wm. Moore, Meaford; Treasurer, M. D. Lemon; Secretary and Manager, J. K. McLauchlan. The captain of the vessel is James Black.

List of Steam Vessels Registered in Canada During June, 1914.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134198	Adaline V.	Sault Ste. Marie	Spanish, Ont.	1913	54 0	13 4	6 8	45	27	14 n.h.p. sc.	J. W. Vance, Spanish, Ont
134262	F. W. Grant	Midland, Ont	Midland, Ont.	1914	75 3	18 0	9 3	119	45	37 " "	Canadian Dredging Co., Midland, Ont.
134330	G. M. Stearns	Chatham	Chatham	1914	58 0	16 8	7 0	57	16	16 " "	F. M. Tweedie, Chatham, Ont.
103823	James Pendergast	Cornwall, Ont.	Kingston, Ont.	1914	60 1	15 3	9 4	64	34	16 " "	J. Pendergast, Cornwall, Ont.
134364	M. & F. Hopper Barge No. 1.	Sorel, Que.	Levis, Que.	1913	180 0	32 1	13 4	676	253	74 " "	Minister of Marine and Fisheries, Ottawa.
134263	Major	Midland, Ont	West Bay City, Mich	1889	292 6	41 0	20 4	2149	1721	137 " "	Great Lakes Transportation Co., Midland, Ont.
134271	Naramata	Victoria, B.C.	Okanagan Land'g, B.C.	1913	89 8	19 5	8 0	150	74	27 " "	Canadian Pacific Railway, Montreal.
134350	Omaha	Montreal	Milwaukee, Wis.	1887	222 8	34 8	18 7	1251	803	66 " "	H. A. Harvey, Montreal.

List of Sailing Vessels and Barges Registered in Canada During June, 1914.

No.	Name	Port of Registry	Rig	Where and When Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
134264	Aloha	Midland, Ont	Schr.	Mt. Clemens, Mich	1888	171 2	32 0	12 0	517	Midland Transportation Co., Midland, Ont.
134093	Alsek	Vancouver, B.C.	Barge	White Horse, Yukon.	1913	89 0	28 2	3 0	222	British Yukon Navigation Co., Vancouver, B.C.
134057	Annie Marcia	Lunenburg, N.S.	Schr.	Bridgewater, N.S.	1914	129 4	31 4	11 5	271	D. Getson, M.O., La Have, N.S.
63264	Benmore	Ottawa, Ont	Ship	Pt. Glasgow, Scotland	1870	242 0	39 2	23 6	1427	Minister of Railways and Canals, Ottawa.
134056	Beryl M. Corkum	Lunenburg, N.S.	Schr.	La Have, N.S.	1914	121 5	30 0	11 0	248	S. Parks, M.O., La Have, N.S.
133674	Eliza A. Scribner	Halifax, N.S.	"	Milford, Del.	1872	133 4	29 6	14 4	357	C. W. Anderson, Sherbrooke, N.S.
134199	H. 24	Sault Ste. Marie, Ont.	Scow	Sault Ste Marie, Mich	1898	68 0	24 0	8 0	156	S. L. Penhorwood, Sault Ste. Marie, Ont.
134200	H. 41	" " "	"	" " "	1895	75 0	22 0	8 5	140	" " " "
134371	H. 42	" " "	"	" " "	1896	75 0	20 0	8 5	128	" " " "
134372	H. 43	" " "	"	" " "	1896	73 5	20 2	8 8	131	" " " "
134373	H. 44	" " "	"	" " "	1898	69 0	20 0	6 0	72	" " " "
134374	H. 45	" " "	"	" " "	1895	73 5	22 0	8 0	129	" " " "
134246	Kruger	Toronto	"	Duluth, Minn.	1904	111 0	27 4	8 0	243	Toronto Sand & Gravel Co., Toronto.
133960	M. & F. Dredge No. 11	Sorel, Que.	Dredge	Sorel, Que.	1811	129 0	42 1	11 9	734	Minister of Marine and Fisheries, Ottawa.
134361	M. & F. Dredge No. 12	" "	"	" "	1912	180 0	40 1	12 0	682	" " " "
134362	M. & F. Dredge No. 13	" "	"	" "	1913	180 0	40 1	12 0	682	" " " "
134363	M. & F. Rock Breaker No. 1	" "	Rock breaker	" "	1911	100 0	36 0	8 3	197	" " " "
126039	Seth, Jr.	Halifax, N.S.	Schr.	Liverpool, N.S.	1910	118 0	30 3	11 1	199	W. Mitchell, Halifax, N.S.
134375	W. 20	Sault Ste. Marie, Ont.	Scow	Duluth, Minn.	1898	75 0	26 0	8 5	166	S. L. Penborwood, Sault Ste. Marie, Ont.
134376	W. 26	" " "	"	" "	1897	116 0	28 5	9 3	306	" " " "
	W. 27	" " "	"	" "	1897	115 0	28 0	8 0	258	" " " "
	W. 35	" " "	"	" "	1883	80 0	26 0	8 5	177	" " " "

The s.s. Princess Margaret, for Canadian Pacific Railway British Columbia Coast Service.

Of the two steamships which the C.P.R. is having built in Scotland, for service along the British Columbia coast, the first, the Princess Margaret, was launched at Dumbarton, June 24, being christened by Mrs. R. Redmond, daughter of Sir Thomas Shaughnessy, as announced in our last issue. The second one, which will be named Princess Irene, will be launched shortly. Following is a general description of the vessels:—Length, 395 ft.; breadth, moulded, 54 ft.; depth to promenade deck, 28¼ ft. Above the promenade deck is the boat deck, having at its forward end the wheelhouse and accommodation for the officers as well as the navigating appliances. In the midship portion there are 42 staterooms, and a vestibule which is panelled in white and lighted by a large dome skylight. The first class smoke room is in old English style, the framing being in antique oak with white panels. At the forward end is an old English fireplace with brickwork tiling.

The boat equipment is especially complete and in addition to a motor boat there is complete lifeboat accommodation, not only for all persons for whom there are berths, but also a considerable margin is provided to deal with deck passengers who might be carried for short voyages. On the promenade deck there are 77 first class staterooms and 8 special rooms en suite. These special staterooms are executed in different styles. At the forward end is the observation room in white with green treillage having a domed ceiling overhead with plastic ornament. The windows are very large and have elliptic tops. The upper deck is devoted to passenger accommodation and includes a ladies' lounge in Georgian style finished in white mahogany furniture and provided with large mirrors flanked by jardinieres. The tea room and writing room are framed in mahogany and have French windows opening into the vestibules, the circular top design being carried completely round the apartments. There are also several suites de luxe. At the forward end there is a large vestibule framed in polished oak with an enquiry bureau, a barber's shop, boot brushing department, and hand baggage room. The main deck aft is fitted up as a dining saloon for first class passengers and has accommodation for 160 persons. The dining saloon is in Georgian style, framed in mahogany, painted white and relieved with delicate tints, the furniture being of polished mahogany. Immediately adjacent to this is a range of pantries and galleys. Alongside the machinery space on the port side is a range of refrigerating chambers, while on the starboard side is accommodation for the engineers.

Most of the remainder of this deck is arranged as a freight space. Special provision has been made for the carriage of motor cars, which may be taken on board through large gangways on the ship's side and stowed free from danger during transit. The lower deck aft is fitted for accommodation of the cooks, stewards and junior engineers, while forward there are rooms for second class passengers, seamen and firemen. A certain amount of cargo will be carried in the forward holds and this will be worked from the freight deck by an electric elevator. All exposed promenades are covered with awnings and electric fan ventilation is fitted throughout the vessel, and steam heating with special controls is installed throughout. All baths are provided with hot and cold water, the hot water being kept in continuous circulation so that it is always available.

The ship is lighted throughout by electricity, the installation being by the builders. A powerful windlass is fitted forward and steam capstan aft for prompt manoeuvring in port. Steering is effected by steam tiller acting on a balanced rudder and controlled by telemotor from the flying bridge. The vessel will be equipped with Marconi wireless telegraphy and a special petrol-driven generating set is installed on the boat deck, capable of working the wireless system as well as lighting the decks, even if there be no steam in the boilers. The vessel will be propelled by geared turbines supplied with steam by oil-fired watertube boilers.

Northern Navigation Company's Bond Issue.

The Northern Navigation Co., of Ontario, which has its headquarters at Sarnia, Ont., has offered in New York bonds for $275,000, which constitute a mortgage on the new s. s. Noronic. The following statement has been made in reference to the matter:—"Canada Steamship Lines, Ltd., which owns the Northern Navigation Co.'s shares, has an authorized issue of $9,000,000 of 1st mortgage debenture stock. Early in the spring $6,300,000 of this stock was sold in London, $2,700,000 being left in the treasury to provide for payment of underlying bonds, and, among other things, the payment of the balance to become due of contract price of the Noronic, $311,000 of debenture stock having been specifically reserved for such purpose. This debenture stock reserved has not yet been sold, and in view of market conditions the company considered it advisable to pay the balance due on the Noronic by issue of 5% bonds, which were taken by the builders at par. $311,000 of the debenture stock of the company will be held in escrow against the payment of these particular bonds, so that the debenture holders are fully protected."

The Gaspe and Baie des Chaleurs Steamship Co., Quebec, Que., has acquired the Campbellton and Gaspe Steamship Co.'s property, and will continue the business under the first name, as announced in our last issue. The company was incorporated under the Dominion Companies Act, with $100,000 capital, of which $40,000 is preferred stock, and the balance common. The acquired company owned the s. s. Canada, which was built in Great Britain in 1892, and was formerly known as Pro Patria. She is screw driven by engine of 131 n. h. p. Her dimensions are, length 185.5 ft., breadth 27.2 ft., depth 19.5 ft.; tonnage, 704 gross, 449 register. The new company also owns the s. s. Gaspesian, formerly D. C. Whitney, which was built as Wallsend on Tyne, Eng., in 1874. She is screw driven by engine of 70 n. h. p., and is of the following dimensions,—length 160.8 ft., breadth 27.1 ft., depth 11.3 ft.; tonnage, 490 gross, 287 register. These vessels are now being operated on routes as follows,—s. s. Canada, sailing from Quebec for Gaspe and Baie des Chaleurs coast, calling at Mechins and intermediate ports as far as Campbellton, N. B.; s. s. Gaspesian, sailing from Quebec direct to Gaspe Basin and all intermediate ports in Baie des Chaleurs, as far as Campbellton, N. B., and also calls at Caraquet.

A memorial has been erected at Southampton, Eng., to the engine room staff of the s.s. Titanic, all of whom went down with the vessel. It consists of a shaft, with an emblematic figure of Glory in bronze, resting on the prow of a boat.

Shipping Report From Fort William.

F. & W. Jones, grain, vessel and marine insurance brokers, Fort William, Ont., wrote July 15:—Coal receipts have dropped off considerably since June, there being only 12 cargoes unloaded—10 bituminous and 2 anthracite. Dispatch consequently is good. Western rail shipments are still keeping small and the bulk of June and July receipts are still on the dock. The line-up of "en routes" is small and prospects of increase do not look much brighter for the immediate future.

Grain shipments remain practically unchanged. 43 cargoes were shipped in the first half of July—31 in Canadian tonnage, and 8 in U.S. tonnage. Of the former two cargoes went to Buffalo, a slight increase in U.S. bottoms, but only at very low rates. Dispatch is poor on account of cargoes having to be collected from many elevators. Of the 8 cargoes in U.S. tonnage, 6 were flax, and the other two part flax. Owing to the large quantity of this grain which has been shipped future loading of it will get more and more protracted. Stocks, receipts and shipments since the last of June are:—

	Stocks.	Receipts.	Shipments.
Wheat	2,827,402	2,619,994	3,820,866
Oats	934,260	641,582	175,890
Barley	234,368	175,811	204,410
Flax	3,009,290	241,472	973,692

There is every indication of an early crop movement, some shippers anticipating that new grain will arrive soon after the middle of August. Weather conditions have not been as favorable as last year. The long spell of dry weather will unquestionably tend toward a lower grade of grain; there are also indications of a heavy mixture of small seeds, which will be another feature in low grading. It is not generally expected that the rail lines will make anything like the determined attempt to rush grain forward that they did last year, the immediate effect of which was that the bulk of the crop had been shipped east well before the close of navigation, causing congestion at eastern points. A much steadier and more even movement is expected, which will probably be much more satisfactory and should increase demand for winter storage at both ends of the lakes. There is estimated to be approximately 10% additional grain acreage under cultivation in Northwestern Canada, except in flax, which shows a slight decrease. This should mean a proportionally large crop movement.

C.P.R. Claims For Empress of Ireland Disaster.—Press reports state that the C. P. R.'s claims against the s.s. Storstad, in connection with the recent St. Lawrence disaster, will come before the courts in September, and that in the meantime the C.P.R. is insisting on some additional security, the amount at present deposited not being deemed sufficient. The claim is for $2,000,000, and it is stated that a further claim for a similar amount will be made. The allegations in the case cover the following points:—That a bad lookout was kept on the Storstad, that the helm was improperly ported, that the vessel improperly failed to keep her course and passed the Empress of Ireland starboard to starboard, that she was navigated at an improper and immoderate rate of speed, that those in charge failed to reduce speed and sound the whistle before the vessels were enveloped in fog, that the engines were not slowed, stopped or reversed in time, and that no competent officers were on duty, and those in charge neglected to comply with the articles of the rules of the road in force in Canadian waters.

Atlantic and Pacific Ocean Marine.

The Canada Line s.s. Gothland, which ran ashore on the Scilly Isles, Eng., June 23, has been released and towed to Southampton for examination and repairs.

A press report states that the White Star Line is having a steamship of the one class type built at Belfast, Ireland, for the Canadian service, and that it will be placed on the route next year. It is said that she will be named Regina.

The Allan Line s.s. Sicilian, bound from London, Eng., for Montreal, calling at Havre, France, had a breakdown of her machinery when two days out, and put back to Queenstown, Ireland, July 9, where her passengers were transferred to another of the company's vessels.

A Montreal press report states that Capt. Kendall, commander of the C.P.R. s.s. Empress of Ireland, which was lost in the recent disastrous collision in the St. Lawrence, will be retained in C.P.R. service, and that after a few months leave of absence he will be appointed to a shore position either in Canada or England.

The Royal Mail Steam Packet Co., which has the contract for the service between Canada and the West Indies, inaugurated a fortnightly service from Halifax, July 3. The s.s. Chaudiere has taken the place of the wrecked s.s. Cobequid. The vessels used are the Chignecto, Chaudiere, Caraquet and Chaleur.

The British s.s. Knight of the Garter, which arrived at Sydney, N.S., recently from Great Britain, has been chartered by the New Zealand Shipping Co. for service between Canada and New Zealand. She loaded about 6,000 tons of rails for Australia at Sydney, and afterwards proceeded to Montreal to complete her cargo.

The Union Steamship Co. of New Zealand's new vessel under construction at Glasgow, Scotland, will be completed shortly, and will, it is announced, start on her maiden trip from Sydney, Australia, to Victoria, B.C., about May, 1915, replacing the s.s. Marama, which will be transferred to the Sydney-San Francisco route.

The Cunard Co., which cancelled the sailings of the steamships Alaunia and Ausonia from Montreal, July 4 and 18, has also cancelled the sailings of the Ascania, Aug. 1; Ausonia, Aug. 22; Alaunia, Oct. 17, and Alaunia, Nov. 21. The s.s. Alaunia, after sailing from Montreal, Sept. 12, is to be transferred to the Liverpool-Boston service.

The agreement between the shipowners and the longshoremen at Montreal expires with the close of navigation, and it is reported that the men are preparing a new agreement for submission to the companies as soon as possible. It is stated that some of the clauses in the present agreement will be so worded as to be easily interpreted by all parties concerned, and that the schedule will be arranged for a further five years.

The s.s. Storstad, which was under charter to the Dominion Coal Co., and which sank the C.P.R. s.s. Empress of Ireland in the St. Lawrence at the end of May, was sold by order of the Admiralty Court at Montreal, July 7. She was purchased by the Prudential Trust Co. for $175,000. It is reported that the company was acting on behalf of the Hull Indemnity Co. of Norway, and that the actual owners were not interested in the purchase.

A Montreal press report states that the Marine Department is making arrangements for dredging an additional channel from Point aux Trembles to Lake St. Peter, to make two channels in the St. Lawrence, one to be used for vessels of less than 15 ft. draught, and the other for ocean going vessels, with the view of minimizing any possible danger in navigation. It is stated that part of the work has been completed, and that surveys are proceeding in anticipation of completing the work next year.

The British s.s. San Francisco, built recently at Londonderry, Ireland, for the Maple Leaf Line, to be utilized in the New York-Vancouver trade, is 417 ft. long, 52 ft. beam, and has a capacity of 9,000 tons deadweight. The holds and 'tween decks are large and roomy to accommodate bulky cargo, and the cargo handling equipment includes two steel derricks of 30 tons lifting capacity, and there are complete installations of fire fighting and life saving equipment. The machinery was built at West Hartlepool, Eng., and shipped to Ireland for installation. During her trials she maintained a speed of over 14 knots.

Maritime Provinces and Newfoundland.

The Department of Public Works will receive tenders to Aug. 26, for the construction of an extension to the breakwater at Negro Point, St. John County, N.B.

The C.P.R. is applying to the Public Works Department for permission to build a wharf in the St. Croix River at St. Stephen, N.B., from the Dominion Fertilizer Co.'s property towards low water mark.

The s.s. Bellaventure, which is making a trip to Port Nelson, Hudson Bay, with men and supplies for the Government harbor work there, will, on her return, it is stated, go to England, where she will be lengthened and otherwise altered.

In recognition of the services rendered in studying the ice conditions on the St. Lawrence, the builders of the ice breaking car ferry which is to be used on the route between New Brunswick and Prince Edward Island, have presented a model of the latest icebreaker built by them to Prof. T. H. Barnes, of McGill University, Montreal.

In connection with the recent judgment in the matter of the collision between the s.s. Storstad and the s.s. Empress of Ireland, it is reported that the Canadian law will probably be altered to provide that officers of foreign vessels engaged in the Canadian coasting trade shall possess Canadian certificates.

The Montreal daily press recently stated that a model of the C.P.R. s.s. St. George, "which will soon take her place between Digby and St. John," is on view at the Windsor St. station, Montreal. The statement that she will soon take her place on the route between Digby and St. John is somewhat belated, as she was placed on this service in Sept., 1913. She has recently been equipped with new turbine engines.

The Reid Newfoundland Co.'s s.s. Invermore, while trying to avoid heavy ice north of Belle Isle Strait, July 10, struck rock near Brig Harbor Point on the Labrador coast, and is reported to have filled rapidly, resting on the rocks with only her top deck above water. The passengers were all landed safely, and the company's s.s. Kyle was immediately dispatched with divers and wrecking gear, as it is believed that the Invermore may be floated.

The s.s. Storstad, which was under charter to the Dominion Coal Co., at the time she collided with the C.P.R. s.s. Empress of Ireland, is in the dry dock at Levis, undergoing repair of the damage she sustained in the collision. The damaged bows have been cut away, and the construction of new bows is being proceeded with. The estimated cost of the repairs is $50,000, and it is stated that she has been re-chartered by the Dominion Coal Co., and all the officers re-engaged.

The Maritime Dredging and Construction Co. has completed about 500 ft. of wharf at West St. John, and it is expected that the new berths will be ready for the winter season. The works at Courtenay Bay are also proceeding rapidly. After a recent visit of a committee of the St. John Board of Trade it was announced that wharf building would be commenced about May 1, 1915, as the progress made with dredging and the construction of the breakwater, etc., will make this possible.

Province of Quebec Marine.

The Department of Marine received tenders recently for the erection of lighthouses at Molsons Island, Black Point, Wadleigh Point and Lead Mines, in Lake Memphremagog.

It was announced in Ottawa, July 15, that the National Transcontinental Ry. car ferry, which is to be used in conveying trains across the St. Lawrence River at Quebec, and which is being built at Birkenhead, Eng., was to undergo her first trials there, July 20.

The Gaspe and Baie des Chaleurs Steamship Co.'s s.s. Canada, while bound from Montreal to Gaspe ports, and Campbellton, N.B., ran on the rocks at Cape Chatte, near Matane, July 12, and is believed to be badly damaged. The passengers were all safely transferred to the company's s.s. Gaspesian.

The Dominion Sand and Barging Co., Ltd., has been incorporated under the Dominion Companies Act, with $50,000 capital and office at Montreal, to carry on a general towing, barging and lightering business, etc., and in connection therewith to own and operate steam and other vessels of all kinds. The incorporators are:—J. R. Morton, N. F. MacNeil, W. R. MacKay, R. S. McGillivray and A. G. Young, Montreal.

The work on the Government dry dock at Lauzon is reported to be progressing satisfactorily. Reports state that all the preparatory work has been completed, and some of the permanent work done. A railway has been built completely round the dock site, and 12 steam drills are boring the rock at various places. The main work at present in hand is the excavation for the dock proper. Dredging is proceeding in the channel to the entrance to the dock. There is considerable plant engaged in the work, including a steam shovel, two locomotives, dump cars, flat cars, steam drills, well driller, etc. M. P. and J. T. Davis are the contractors.

Ontario and the Great Lakes.

Capt. G. Scagel has been appointed harbor master at Fort William, vice Capt. McAllister, deceased.

The Muskoka Lakes Navigation and Hotel Co. paid a dividend at the rate of 5% per annum, July 15.

The Department of Public Works has awarded the contract for the construction of harbor improvements at Port Hope to Tompkins and Cunningham, Ottawa.

During the latter half of June, 47 cargoes of grain were shipped eastward from Port Arthur and Fort William, approximating 5,484,650 bush. Of these, 45 cargoes were shipped in Canadian bottoms.

The Windsor and Pelee Island Steamship Co.'s s.s. Pelee was placed on a weekly route, for the remainder of the season from

July 15, between Windsor, Detroit, Walpole Island, Port Lambton and Wallaceburg.

The wreck of the wooden s.s. City of London, which had been lying on the middle ground, Pelee Island, since a collision with the s.s. Joe S. Morrow last season, has been broken up by dynamite.

The s.s. I. W. Nicolas, one of the vessels wrecked during the storm of Nov. 9, 1913, and which was purchased by the Reid Wrecking Co., has been repaired and shortened to Welland Canal size.

The contract for the construction of the last section of the Trent Canal, that from Lake Simcoe to Georgian Bay, has been awarded to Randolph Macdonald Co., Toronto, at prices approximating $900,000.

A press report from Detroit, Mich., states that the Pittsburg Steamship Co. intends equipping all its vessels with large electric lighted signs bearing the name of the vessel. One has been so equipped for experimental purposes.

It is reported that the Lake Superior Dry Dock and Shipbuilding Co. has made the final payment on the site on which it purposes building its plant at Sault Ste. Marie. Work commenced on the clearing of the site, June 30.

The Dominion Government is having built at Collingwood a steam hopper barge, 165 ft. long, 35 ft. beam and 14 ft. deep. She will be built of steel throughout and equipped with engines of about 800 h.p. The approximate cost is $160,000.

The Canada Steamship Lines s.s. Cayuga, running between Toronto and the Niagara River, broke a propeller blade, while about a mile from Niagara on the Lake, July 12. She proceeded to Toronto, where the damage was repaired.

The Public Works Department has completed the construction of a concrete wharf at Windsor at an approximate cost of $60,000. A warehouse of reinforced concrete is now being erected thereon, which will cost about $10,000.

The Chicago, Duluth and Georgian Bay Transit Co.'s s.s. South American was presented with a Union Jack by the citizens of Fort William, when she called there on her maiden trip from Chicago to Georgian Bay ports, June 29.

The Canada Steamship Lines s.s. W. Grant Morden discharged her record cargo of 12,470 tons of iron ore at Port Colborne recently. The unloading was accomplished in what is stated to be the fastest time known on similar cargo.

Reports as to receipts from the passenger traffic for Canada Steamship Lines for the current season indicate considerable increase over those of last year, while receipts from freight, though not so high as last year, are said to be not far behind.

Various officers on the Canada Steamship Lines steamships Cayuga, Chicora, Chippewa, Kingston, Rochester and Toronto, were fined $200 and costs each recently, aggregating $1,416.45, for allowing the sale of intoxicating liquor on board.

Capt. James McAllister, harbormaster at Fort William, died there July 4, after an attack of paralysis, aged 54. He had been connected with the lakes marine during the greater part of his life, and was master of the C.P.R. s.s. Alberta for a number of years.

The s.s. Howard M. Hanna Jr., which was driven on the rocks at Point aux Barques, Nov. 9, 1913, has been floated by the Reid Wrecking Co., Sarnia, who purchased her, and has been taken to Port Huron, where she was dry docked for examination and repairs.

The s.s. Turret Chief, which was driven ashore in the storm on the Great Lakes near Copper Harbor, July 6, and taken to Copper Harbor, where temporary repairs were undertaken, after which she proceeded to Montreal. The damage sustained was not so great as at first feared.

A contract is reported to have been awarded to the Great Lakes Dredging Co. for the dredging of about 35 acres at Fort William on the south side of the Kamistikwia River above the G.T.P.R., for a turning basin. Work, it is said, will be commenced at once.

The contract for the construction of the stone protection on the summit level of the Welland Canal, between Thorold and Port Colborne, has been awarded by the Department of Railways and Canals to A. T. Bradley, St. Catharines, and David Walker, Thorold, Ont.

The Port Colborne Dock and Coal Co., Ltd., has been incorporated under the Ontario Companies Act with $50,000 capital and office at Toronto, to carry on a general coal and shipping business. The incorporators are J. A. Kent, L. G. Jarvis and F. Walkinshaw, Toronto.

The Duluth Inspector of Steamboats has suspended the license, for 60 days, of Capt. W. I. Thompson, owner of the ferry Charles S. Osborne, running into Sarnia, for not blowing proper passing signals and colliding with a motor boat, endangering the lives of the passengers.

Capt. W. G. Cox, of the Northern Navigation Co.'s s.s. Majestic, died suddenly, from apoplexy, on board his vessel between Killarney and Parry Sound, July 15. Prior to taking charge of the Majestic he had been on the same company's steamships Germanic and Saronic.

The s.s. Sarnor, registered in Montreal and owned by Canada Cement Transport, Ltd., ran aground at Goose Neck Island, about three miles east of Morrisburg, July 8. She is a wooden vessel and was renamed as a recovered wreck some time ago, having formerly been known as Britannic.

A report from Cobourg states that the Trent Canal between Peterboro' and the Bay of Quinte will be opened next autumn, and that on the reopening of navigation a regular service will be established thereon. It is also stated that the new section between Balsam Lake and Lake Simcoe is to be deepened.

The Montreal Transportation Co.'s s.s. Northmount sailed from Sydney, N.S., July 10, for Port Arthur, Ont., with 1,900 tons of steel rails for the Canadian Northern Ry. This vessel is being followed by the same company's steamships Glenmount, Stormount and Kinmount, in similar service.

Lightship no. 3, for the Department of Marine, was launched at Polson Iron Works, Toronto, July 24. She has been specially built for service in connection with the construction of the terminals at Hudson Bay. Two similar vessels have already been dispatched from Toronto and are now on their way to Port Nelson.

It is reported that a wrecking party has been arranged for, including divers, to investigate the wrecked s.s. Charles S. Price, which was found floating bottom upwards in Lake Huron after the storm of Nov., 1913. It is stated that the hull is to be examined, and if it is in good condition the underwriters will have the vessel raised.

A press report states that the plans for the proposed dry dock for Owen Sound will be filed about the middle of August. They will provide for a dry dock to take vessels, it is stated, up to almost 800 ft. long. M. F. F. Wood, of Niagara Falls, is said to be chiefly interested in the project, for which bylaws have been passed granting subsidies in aid.

It is stated that the s.s. City of Ohio, which runs into Port Stanley, will discontinue such service, unless the conditions in the harbor are improved. It is claimed that she has considerable difficulty in making the harbor safely, on account of the obstructions caused by dredges and barges engaged on the harbor improvement works there.

The Niagara, St. Catharines and Toronto Navigation Co.'s s.s. Garden City, while passing the s.s. Port Colborne at the piers at Port Dalhousie, July 19, collided with one of the piers, smashing her paddle box and breaking off some blades of the paddle wheel. The trip to Toronto was cancelled, but she crossed later in the day, without passengers; and repairs were made.

The Canadian Lake and Ocean Naviga-

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during June.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	406	8,712	9,118
Grain	"	Bushels	5,204,182	1,928,569	7,132,751
Building stone	"	Short tons			
Flour	"	Barrels	280,050	846,180	1,126,230
Iron ore	"	Short tons	3,770,037	1,577,546	5,347,583
Pig iron	"	"		1,913	1,913
Lumber	"	M. ft. b.m.	2,007	70,140	72,147
Silver ore	"	Short tons			
Wheat	"	Bushels	8,917,147	2,056,111	10,973,258
General merchandise	"	Short tons	7,927	25,133	33,060
Passengers	"	Number	2,240	2,600	4,840
Coal, hard	Westbound	Short tons	69,412	344,989	414,401
Coal, soft	"	"	333,795	1,512,894	1,846,689
Flour	"	Barrels	150		150
Grain	"	Bushels			
Manufactured iron	"	Short tons	3,785	25,667	29,452
Iron ore	"	"			
Salt	"	Barrels	6,321	70,740	77,061
General merchandise	"	Short tons	73,990	120,874	194,864
Passengers	"	Number	3,641	1,998	5,639
Summary.					
Vessel passages		Number	993	1,812	2,805
Registered tonnage		Net	2,946,998	3,718,136	6,665,134
Freight—Eastbound		Short tons	4,172,155	1,918,991	6,091,146
" —Westbound		"	481,900	2,015,035	2,496,935
Total freight		"	4,654,055	3,934,026	8,588,081

tion Co.'s s.s. Turret Chief, which has been on the rocks about six miles east of Copper Harbor, Lake Superior, since she was driven there during the storm on the Great Lakes, Nov. 9, 1913, has been released and taken to Port Arthur for examination. Apart from the damage to the hull, she is said to be in good condition. The underwriters have offered her for sale by tender in her present condition.

Work was started early in July on the construction of a large turning basin at Fort William, about five miles up the Kaministikwia River. Two clam shell dredges were put to work to remove the loose earth, and later, large dipper dredges were placed in operation. It is estimated cleared, and that the work will occupy about two years.

It is reported that the third lock of the U.S. canal at Sault Ste. Marie is practically completed, and will be ready for business about Sept. 1. Water has been let into the approaches at either end, and only some finishing touches remain to be made to the entrance channels. The lock is large enough to accommodate two of the largest vessels operating on the lakes at one time, and there is a depth of 25 ft.

A press report from Fort William states that a movement is on foot there to organize a steamship company to operate a line between Fort William and Montreal and intermediate points. It is said that the project is backed by Duluth capital, and that negotiations are proceeding for the purchase of five vessels. The report states that the capital will be $2,000,000, and the head office at Fort William.

The C.P.R. s.s. Assiniboia ran aground near Cove Island, Lake Huron, July 2. The passengers were safely transferred to the company's s.s. Alberta, and after the removal of the cargo the Assiniboia was refloated the following day. She proceeded to Collingwood under her own steam, where an inspection showed that there was considerable damage to the hull, necessitating the replacing of a number of plates.

A large steel scow was launched at the Polson Iron Works, Toronto, July 18, for the Canadian Stewart Co., for use on the harbor improvement works. She is 120 ft. long, 42 ft. wide and 12 ft. deep, is built of ⅜ in. steel plate, and is of extra heavy construction. During the launching, she collided with the old Knapp roller boat, which has been lying there for several years. The scow was undamaged, but the roller boat had a large hole cut in her side.

The U.S. Lake Survey reports the levels of the Great Lakes, in feet above tidewater, for June, as follows:—Superior, 602.49; Michigan and Huron, 580.60; Erie, 573.04; Ontario, 246.91. Compared with the average June levels for the past ten years, Superior was 0.19 ft. above; Michigan and Huron, 0.47 ft. below; Erie, 0.02 ft. above, and Ontario, 0.23 ft. below. It was anticipated that during July Superior would be 0.2 ft. higher; Michigan and Huron 0.1 ft. higher; Erie, 0.1 ft. lower, and Ontario, 0.1 ft. lower.

Capt. W. N. Storey, who died at Collingwood, July 18, aged 73, was born at South Shields, Eng., and came to Canada at nine years of age. He entered transportation service as a young man, on sailing vessels, and was later master of several steam vessels. He went to Collingwood in 1879, as Purchasing Agent, Hamilton and Northwestern Ry., and later was employed by the Lake Superior and Chicago Transportation Co., and was also in the service of the Great Northern Transit Co., the North Shore Navigation Co., and the Northern Navigation Co.

The U.S. Lake Survey s.s. Col. J. L. Lusk, engaged on survey work and examinations in the vicinity of Marquette and Presque Isle harbors, Lake Superior, reports the discovery of an uncharted shoal, 1,250 ft. from the centre of the largest and most northerly of the Presque Isle Point rocks. The obstruction is a small sized pinnacle rock rising out of deep water to within 11½ ft. of the surface. Being in an outlying position near a sailing course it constitutes a dangerous menace to navigation. A second shoal with least depth of 3½ ft. was found 750 ft. from Marquette lighthouse. This is close to shore and inside of charted shoals but lies near the centre of a passage much used by small craft. It is unimportant to deep draught shipping.

Manitoba, Saskatchewan and Alberta.

The Victoria Beach Co. has chartered the steamboat Goldfield for a daily service between Gimli and Winnipeg Beach, and Victoria Beach, Man., about 21 miles. There is accommodation for about 90 passengers and equipment for serving light lunches.

The steamboat George H. Bradbury, built recently at Sorel, Que., for Dominion Government use on Lake Winnipeg, was recently dismantled at Sorel and shipped by train to Selkirk, Man., where she will be reassembled under the supervision of the Marine Superintendent at Sorel.

R. D. Brooks, of Saskatoon, Sask., is reported to have purchased the launch Saskatoon, from R. J. Barry, for operation on the Saskatchewan River, for the remainder of the season, between Pas and the Portage. The Saskatoon is 36 ft. long and is driven by a 35 h.p. engine.

The first of the vessels which the Saskatchewan Steamship and Coal Co. is building at Prince Albert, some details of which were given in our last issue, was expected to be launched towards the end of July. She is stern wheel driven, and is 140 ft. long, by 32 ft. beam, and will have accommodation for 60 passengers and 150 tons of freight.

The recent appropriation of $200,000 made by the Dominion Parliament for increased dockage facilities at Winnipeg and St. Boniface, is stated to be the commencement of a large scheme for the general betterment of the property under the control of the Winnipeg Harbor Commissioners. The docks will be built by the Government, and on completion handed over to the commission for management.

The steamboat George V., formerly owned by the City of Prince Albert, Sask., has been sold to the Northland Navigation Co., Ltd., Pas, Man. She was built at Prince Albert in 1911, and is paddle wheel, driven by engine of 4 n.h.p. Her dimensions are, length 110 ft., breadth 26.7 ft., depth 4 ft.; tonnage, 105 gross, 66 register. An office has been opened at Pas, and the vessel is being operated between Pas and the Portage, on the Saskatchewan River.

British Columbia and Pacific Coast Marine.

The Department of Public Works received to July 27 tenders for the building of a quay wall and certain excavation work in Victoria harbor.

The s.s. Joan, which was recently purchased from the C.P.R. by the Terminal Navigation Co., Vancouver, has had her name changed to Ballena.

The Grand Trunk Pacific Coast Steamship Co. placed its s.s. Prince John on a route between Prince Rupert and Naas River points, July 3, calling at Port Nelson, Arrandale, Kincolith, Naas Harbor and Mill Bay.

Regarding reports that the Department of Public Works will shortly call for tenders for the construction of the projected dry dock at Esquimalt, we were officially advised, July 3, that it is not expected that plans and specifications will be ready for the calling for tenders before October.

Capt. C. H. Nicholson, Manager, G. T. Pacific Coast Steamship Co., announced recently that the company's vessels would be overhauled at Prince Rupert next winter, the sectional steel floating dry dock being sufficiently advanced to accommodate the vessels for cleaning and painting.

It is reported that the grading and excavation in connection with the Marine Department's depot site on the Songhees Indian Reserve, Victoria, will be completed early in August. All the bearing piles of the wharf have been driven and capped, the L portion of the wharf is floored, and a considerable portion of the balance of the structure is in position. The length of the wharf will be 650 ft., running 424 ft. north and south, and 225 ft. inshore. The work was commenced in May, Parks, Tupper and Kirkpatrick being the contractors. The plans of the buildings have not yet been approved.

The North Fraser Harbor Commission is reported to have purchased a number of small vessels to be used in connection with the work being carried out in the north arm of the Fraser River. The contract for the making of a channel is reported let to K. S. Robinson, and several holes have been sunk at various points to determine the class of material to be dredged. In addition to this work, parties are out making surveys of the tides and currents, and selecting sites for further boring tests. Plans are in course of preparation for the work as it will be completed, which have to be passed by the Public Works Department. Good progress is being made with the construction of the 4 mile jetty at the mouth of the north arm at McMillan's Island, this work being undertaken by the Dominion Government for the protection of the channel. A considerable portion of the bulkhead work is reported completed.

The reports, which have now become hardy annuals, to the effect that the Canadian Northern Ry. and the G.T. Pacific Ry. are shortly to inaugurate steamship services on the Pacific Coast, with additional services through the Panama Canal and thence to Europe, are again in evidence in the far west. This year it is stated that tenders for the building of the necessary vessels will be asked for shortly. Last year it was said the vessels were actually under construction in Great Britain. As we have stated before, it is more than likely that both companies will operate steamships in the general Pacific trade on the completion of the railway systems, but it can be taken for granted that no move will be made in this direction until the railways are actually completed. The G.T.P.R. has been operating a number of steamships on the Pacific coast for some time, and may eventually operate, either directly or indirectly, across the Pacific.

The Dominion Shipbuilding, Engineering and Drydock Co., Ltd., has been incorporated under the British Columbia Companies Act, with $5,000,000 capital, and office at Vancouver, to carry on a general shipbuilding, drydock and engineering business. The site for the project has been selected on the north shore immediately west of the Indian reserve, which is some distance west of the North Vancouver ferry wharf. The land acquired is about 60 acres, with a water frontage of about 1,700 ft. H. H. Stevens, M.P. for Vancouver, is reported to have stated that

it is proposed to establish a dry dock capable of accommodating the largest vessels afloat. It would be in two sections and 1,150 ft. long, so that two fair sized vessels could be handled at one time. Plans had been deposited with the Government, and it is expected that the maximum subsidy of 4% on a capital expenditure of $5,500,000 will be granted in aid. Negotiations have been under way for some time regarding the financing of the project in England, and it is anticipated that this will be accomplished in the near future.

Powerful Dredge for Toronto Harbor Development.

The first of two large dredges for use on the Toronto Harbor Commission's improvements to the harbor was launched at Polson Iron Works, July 11, and named Cyclone. These dredges are being built for the Canadian Stewart Co., the general contractors for the work.

The hull, which is of steel, is built on lines similar to a battleship, instead of an ordinary dredge, and weighs 750 tons. It is 170 ft. long, 42 ft. beam, and 12 ft. deep. The framework under the engine is built extra heavy, comprising extra deep floors, intercostal at intervals. The engines, which were supplied from the United States, are of the ocean going type, which are necessary for the great strain while the suction pumps are in operation. The ladder is 10 ft. long, at the base of which is the boring machine, weighing about 50 tons. The suction pipe is capable of dredging a channel 500 ft. wide. The pump in the middle of the dredge is operated by an engine of 1,750 h.p., and the dredge is equipped with a pipe line over a mile long.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

185. June 6. Quebec, River St. Lawrence, chart of Lake St. Louis, correction.

186. June 6. Ontario, Lake Erie, Port Burwell, gas lighted beacon established on west breakwater.

187. June 6. United States of America, Lake Ontario, east end, uncharted shoal southward of Calf Island.

188. June 9. Ontario, River St. Mary, Sault Ste. Marie Canal, channel at lower entrance, change in characteristic of gas buoy light.

189. June 9. Ontario, River St. Mary, Sault Ste. Marie Canal channel at upper entrance, change in characteristic of gas buoy light.

190. June 9. Ontario, River St. Mary, Vidal shoal, change in characteristic of gas buoy lights.

191. June 9. Ontario, Lake Superior, eastern end, Outer Pancake shoal, change in color of gas buoy light.

192. June 11. British Columbia, Fitzhugh Sound, Aldenbrooke Island, fog bell, additional information.

193. June 11. British Columbia, Vancouver Island, east coast, Stuart Channel, Oyster harbor, Cluster rocks, beacon discontinued.

194. June 11. British Columbia, Vancouver Island, Saanich Inlet, southwestward of White rocks, buoy established.

195. June 11. British Columbia, Johnstone Strait, Thurlow Island, Vansittart, day beacon moved and enlarged.

196. June 11. British Columbia, Okisollo Channel, Bjerre rock, day beacon erected.

197. June 11. British Columbia, Okisollo Channel, Pulton Bay, day beacons erected.

198. June 12. Ontario, Lake Huron, channel northwestward of Cape Hurd, buoys established.

199. June 12. Ontario, Georgian Bay, Victoria Harbor, buoys discontinued.

202. June 20. British Columbia, Canadian list of lights and fog signals, new edition.

203. June 20. British Columbia, Vancouver Island, Juan de Fuca Strait, Sooke Inlet, Whiffen spit, change in color of light.

204. June 20. United States of America, Haro Strait, San Juan Island, Limekiln light established.

205. June 22. Canadian list of lights and fog signals, new edition.

206. June 22. Ontario, Lake Huron, Goderich north breakwater, fog alarm under construction, new lighting apparatus being installed in beacon.

207. June 22. Ontario, Georgian Bay, east side, Brebeuf Island, Brebeuf front range light improved.

208. June 23. Ontario, Napanee River, dredging, list of buoys.

209. June 25. New Brunswick, south coast, Bay of Fundy, Lorneville, light established on breakwater.

210. June 25. Nova Scotia, Bay of Fundy, Minas Basin, Tennycape, pole light on wharf

211. June 25. Quebec, River St. Lawrence below Quebec, Traverse of St. Roch, lower end, change in position of lightship.

212. June 25. United States of America. Massachusetts, Boston harbor, Gallups Island, light and fog signal established.

213. June 26. Ontario, Georgian Bay, east side, inside channel between Penetanguishene and Parry Sound, buoys established.

214. June 26. Ontario, Georgian Bay, east side, inside channel between Penetanguishene and Parry Sound, beacons erected.

215. June 29. Quebec-Ontario, River St. Lawrence, Lake St. Francis, eastern portion, chart, Coteau Landing to Lancaster, issued.

216. June 29. Ontario, River St. Lawrence, Thousand Islands, channel northwest of Grenadier Island, buoyage.

217. June 30. British Columbia, Vancouver Island, west coast, off Cape Beal, submarine bell buoy not to be established

218. June 30. British Columbia, Vancouver Island, west coast, off Clo-Oose, submarine bell buoy to be established.

219. June 30. British Columbia, list of buoys, beacons and daymarks, corrections.

220. June 30. British Columbia, Porlier Pass, south of Virago Rock, buoy to be withdrawn.

221. June 30. British Columbia, Vancouver Island, east coast, False Narrows, buoys to be withdrawn.

222. June 30. British Columbia, Portland Inlet, Naas Bay, Fort Point, day beacon erected.

223. July 2. Canada, regulations governing the operation of swing spans of railway bridges.

224. July 3. Nova Scotia, south coast, Halifax harbor, Ives Knoll, conical buoy to be replaced by gas buoy.

225. July 3. Prince Edward Island, north coast, Savage harbor, bearing of range lights.

226. July 3. New Brunswick, north coast, Chaleur Bay, Grande Anse, light established.

227. July 3. Quebec, River St. Lawrence, off Metis Point, change in position of submarine bell buoy.

228. July 3. Quebec, River St. Lawrence, Lavaltrie to Ile Deslauriers, positions of buoys marking Repentigny Channel.

229. July 8. Quebec, River St. Lawrence, Lake St. Louis, inner channel between Lachine wharf and Dorval, buoys established.

Telegraph, Telephone and Cable Matters.

J. D. Wood, assistant traffic chief, Great North Western Telegraph Co., Montreal, died there, July 4, after an illness lasting from the commencement of the year.

The Dominion Government is undertaking the erection of a telegraph line from Lake Saskatoon, Alta., to Fort St. John, B.C. It is expected that the work will be completed by the end of the year.

The Pacific Cable Board has applied to the Department of Public Works for permission to lay a cable from the Pacific cable hut at Bamfield to Alberni, B.C., and has deposited a plan and description of the site selected.

The Maritime Telegraph and Telephone Co. has laid a combined telegraph and telephone cable between Wood Islands and Caribou, thus establishing telephone communication between Prince Edward Island and the mainland.

The Canadian Northern Telegraph Co. has opened an office at Weldon, Sask.

J. Kent, Manager, C.P.R. Telegraphs, and J. McMillan, General Superintendent of Telepraphs, Western Lines, inspected the telegraph lines in the western provinces during July.

J. G. Davies, heretofore local manager, C. P. R. Telegraphs, Victoria, B. C., has been appointed local manager, Great North Western Telegraph Co., Ottawa, Ont., vice C. G. Davies, his brother, promoted. Pending the arrival of the new manager, R. J. Daly acted in that capacity.

The Marconi Wireless Telegraph Co. (English) announces dividends of 10% on both the preference and ordinary shares, making a total of 17% on the preference, and 20% on the ordinary for the year. The gross profits last year were £254,583, and the net £122,323.

The Department of Public Works received tenders to July 27, for the supply of 23 knots of single conductor submarine telegraph cable, delivered at Halifax, N.S.; 14 knots of similar cable, delivered at Vancouver, B.C.; 270,000 lbs. of galvanized iron telegraph wire, delivered at Montreal, and 342,000 lbs. of similar wire, delivered at Vancouver, B.C.

C. E. Davies, local manager, Great North Western Telegraph Co., Ottawa, Ont., has been appointed Superintendent of Traffic, Toronto. He came to Canada in 1906, from Helena, Mont., where he had been in the Western Union Telegraph Co.'s service, and entered G. N. W. T. Co.'s service as chief operator at Ottawa. He was appointed local manager there in 1906, and in 1911 was also appointed Superintendent of Equipment.

The old building, which housed the Western Union Telegraph Company in New York since 1875, is being taken down to make room for a modern structure. The telegraph company has moved to new quarters. Moving a large station such as this, with 2,500 wires and over 1,000 employes, handling 150,000 messages a day, was no small matter. Promptly at midnight on Saturday, June 27, the moving commenced. During the slack hours of Sunday the transfer was completed, and the operators had a chance to become acquainted with their new surroundings.

The Universal Radio Syndicate's wireless telegraph station at Newcastle, N.B., is completed, and the companion station at Ballybunion, Ireland, is reported to be almost complete. The system of telegraphy in use is the Poulsen, differing materially from the Marconi system. In the latter the line of transmission is opened at each sig-

nal, whereas in the former the current is continuous, the signals varying at the will of the operator. The cost of the Newcastle station is about $175,000, the plant occupying about 54 acres on the bank of the Miramichi River. The steel tower is 506 ft. high, and there are 6 wooden towers, all on concrete foundations.

W. E. Earle, Superintendent, Western Union Telegraph Co., North Sydney, N. S., retired from active service, June 30, after 55 years of telegraph service. He entered the New York, Newfoundland and London Telegraph Co.'s service in 1859, and was stationed at St. John's, Nfld. He was transferred to North Sydney in Aug. 1875, and acted as assistant to the Manager, and was subsequently appointed Superintendent. In recognition of his long and faithful service, the company has granted him a retiring allowance of $1,800 a year. He entertained the local staff to a steamboat excursion on July 4.

The Dominion Telegraph Co.'s annual meeting was held at Montreal, July 8. The report for the year ended June 30 showed total assets of $1,307,859.30, and liabilities (including dividend, payable July 15, $14,600) of $1,015,959.33, with a balance at credit of profit and loss of $291,899.97. The interest at 6% per annum, guaranteed by the Western Union Telegraph Co., has been paid quarterly in advance for the past 35 years. The Western Union leases the company's property, for 99 years from July 1, 1879. The officers were reelected for the current year as follows:—President, T. Swinyard; Vice President, Sir Henry Pellatt; Secretary and Treasurer, F. Roper; other directors, B. Brooks, T. F. Clark, R. C. Lowry, Aemilius Jarvis, C. O'Reilly and G. P. Scholfield.

The Board of Railway Commissioners has extended the time to Dec. 1, for the approval of telegraph tolls, as follows,—C. P. R., between points in Canada, west of and including Sudbury, Ont., to and from points west of Sudbury from and to points east thereof and east of and including Windsor, Ont.; Great North Western Telegraph Co., between points in Canada west of North Bay, Ont., and to and from points west of North Bay and to points east thereof, and east of and including Windsor, Ont.; White Pass and Yukon Route, between points in Canada; G. T. Pacific Telegraph Co., between points in Canada, with the exception of the tolls between its local offices on the Ottawa Division, and between them and Swanton, Vt.

At a meeting of the Dominions Royal Commission at London, Eng., recently, on a discussion relating to the proposal to establish an all British cable route between England and Australasia, by way of Canada, S. J. Goddard, European representative, Western Union Telegraph Co., submitted a proposition covering the leasing to the Governments concerned, of one of the company's existing Atlantic cables, including an arrangement to operate it by British subjects on British territory, on behalf of the Governments. He stated that he had placed the proposal before the President of the company, who saw no insuperable objection, subject to the company's interests being properly protected. The proposal covers the leasing of a line between London and Montreal, where connection would be made with a C.P.R. land line, leased to the Pacific Cable Board, running to British Columbia, where it joins the Pacific cable operated by the Pacific Cable Board.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened an office at Weldon, Sask.

The liquidation of the assets of the United States Ex. Co., which retired from business June 30, as mentioned in our last issue, is proceeding satisfactorily. The mileage operated has been distributed amongst the other companies in certain proportions, and it is said that the various offices and general equipment will be taken over by the other companies, and that practically all of the employes will also be employed.

H. D. Walker, a teller in the Dominion Ex. Co.'s service at Vancouver, B.C., pleaded guilty there, July 6, to the theft of $8,050 from the company, all of which had been taken within six weeks of his arrest. His statement that he had taken certain amounts at various times, to make good the loss of a parcel of the company's bills amounting to $3,000, several years ago, was not borne out by the company's books, as his accounts were quite correct to the end of March. He was sentenced to five years imprisonment.

In connection with the recent litigation between the British Columbia Express Co. and the G.T. Pacific Ry. regarding certain bridges across the Fraser River, which the former claimed interfered with its business, the Board of Railway Commissioners has dismissed the B.C. Ex. Cos. application for an order directing the G.T.P.R. to remove the temporary bridge across the Fraser River below the confluence with the Nechaco River, and to make openings in the permanent steel bridge across the Fraser River at mileage 142 and at 189.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Canadian Steel Foundries, Ltd.—Herbert Ewan, of the company's sales department, has been appointed Sales Manager, succeeding E. C. Jackson, resigned to go into business for himself.

Brown Hoisting Machinery Co., Cleveland, Ohio, has issued catalogue S. 1914, 42 pages, 6 by 9 inches, describing and illustrating Brownhoist suspended concrete bins.

Canadian General Electric Co., Ltd., Toronto, is distributing General Electric Co.'s bulletin 44010, describing and illustrating the high voltage d.c. equipment of the Pittsburg and Butler St. Ry.

Canadian Gold Car Heating and Lighting Co., Ltd., 346 St. James Street, Montreal, has issued two circulars describing and illustrating Gold's no. 938 packless quick opening twin supply valve and Gold's no. 940 packless quick opening supply valve.

Canadian Gold Car Heating and Lighting Co., Ltd., 346 St. James Street, Montreal, has issued a 4 pg., illustrated circular about Gold's no. 804 S positive lock coupler, interchangeable with all makes, entire coupler M.C.B. recommended practice.

Young's, Ryland St. Works, Birmingham, Eng., have issued a 12 pg. booklet, 6½ by 8 inches, "The Ryland Patent Worm Screw Pulley Block," the special advantage claimed for which is its quick lowering and control brake. It is made to lift up to 3 tons.

The American Hoist and Derrick Co., St. Paul, Minn., manufacturer of contracting and quarrying machinery, has removed its office in Seattle, Wash., from 613 Western Ave., to 1512 L. C. Smith Bldg., which is a most central location. F. R. Schoen has charge of the Seattle office, and a full line of hoisting machinery and repair parts is carried there.

The Titanium Alloy Manufacturing Co., Niagara Falls, N.Y., announces that it has organized a bronze department, for the manufacture of Titanium bronze specialties, and that W. M. Corse, formerly Works Manager, Lumen Bearing Co., Buffalo, and lately General Manager, Empire Smelting Co., Depew, N.Y., will be Manager of the new department.

Butterfield & Co., of Derby Line, Vt., and Rock Island, Que., are building an addition to their factory at Rock Island. The new building will be 185 by 60 ft., and three stories high, of brick and concrete construction. A portion of it will be used for manufacturing twist drills and milling cutters. It is hoped the factory will be in operation by January 1, 1915.

Babcock & Wilcox, Limited, Montreal, write as follows:—"We understand it has been currently reported that it was a Babcock & Wilcox boiler which blew up and caused the recent disaster at Westville, N.S., and it is only fair to ourselves that this should be contradicted emphatically. The boiler that blew up was of the staybolt water leg design, and an entirely different boiler to the Babcock & Wilcox forged steel sectional type. The Intercolonial Coal Mining Co. has since purchased two large Babcock boilers to form the nucleus of a new steam plant."

The Independent Pneumatic Tool Co., of Chicago and New York, has leased the two story building at 334 St. James St., Montreal, and has arranged to open a branch store, where its Canadian business will be transacted after Aug. 9. A complete line of Thor pneumatic tools, electric drills, accessories and spare parts will be carried in stock for immediate delivery on orders in Canada, and Thor users will receive service direct from the company in the future. W. H. Rosevear, who has been in railway service and in the railway supply and machine tool business, latterly in Winnipeg, has been engaged as Manager, and is now in Montreal.

Transportation Conventions in 1914.

Aug. 11-14.—Railway Gardening Association, New York.
Aug. 18.—International Railroad Blacksmiths' Association, Lima, Ohio.
Aug. 20, 21.—American Association of Railroad Superintendents, New York.
Sept. 1-4.—American Boiler Manufacturers' Association, New York.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Nashville, Tenn.
Sept. 15, 16.—American Association of General Passenger and Ticket Agents, Boston, Mass.
Sept. 22-24.—Railway Signal Association, Bluff Point, N.Y.
Oct. —.—American Association of Dining Car Superintendents, Washington, D.C.
Oct. 12-16.—American Electric Railway Association, Atlantic City, N.J.
Oct. 14-16.—American Association of Railway Surgeons, Chicago, Ill.
Oct. 19-23.—Association of Railway Electrical Engineers, Chicago, Ill.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17.—National Association of Railway Commissioners, Washington, D.C.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.
Nov. 18.—American Railway Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, Counsel, F. King, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

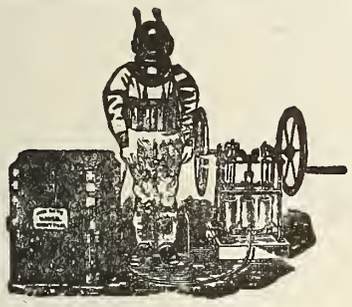
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, A. F. Dion, Quebec.

Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.

Western Canada Railway Club, Louis Kon, Immigration Agent, G.T. Pacific Ry., Winnipeg. Meetings at Winnipeg 2nd Monday each month, except June, July and August.



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NOTICE.

The General Railway Signal Company of the United States of America, the owner of the exclusive rights to Canadian patents No. 92323, No. 93127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signalling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents to the fact that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.

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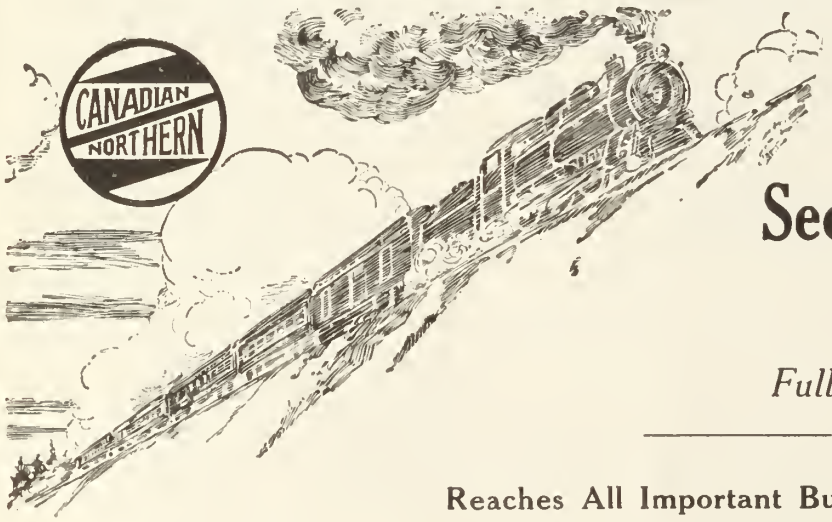

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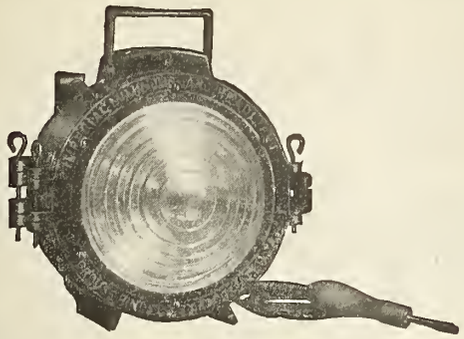

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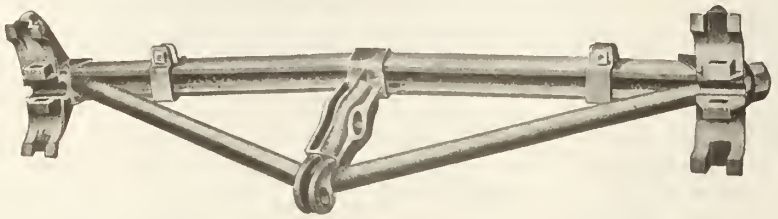

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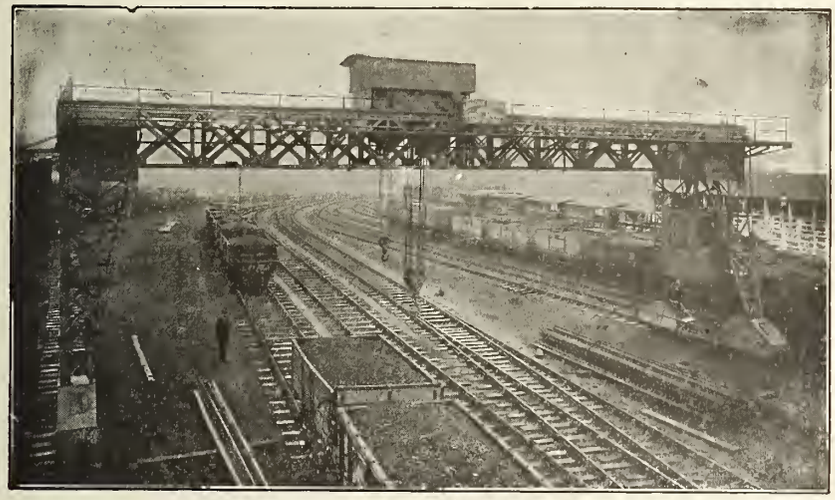

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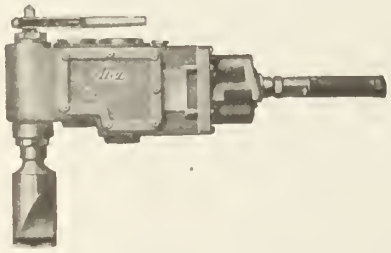

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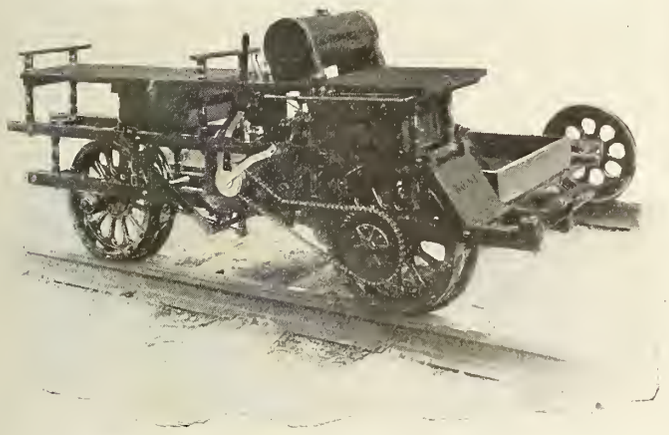

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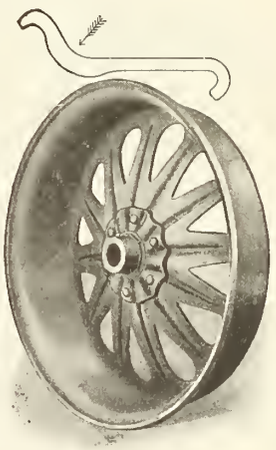

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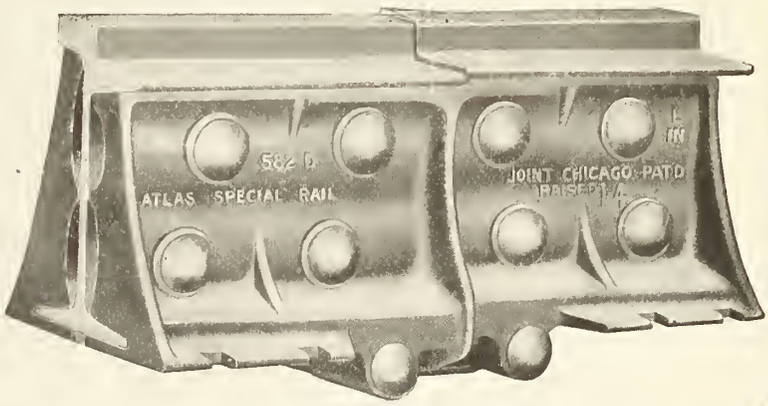

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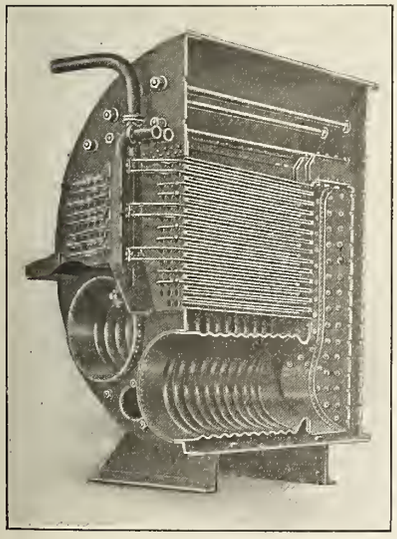

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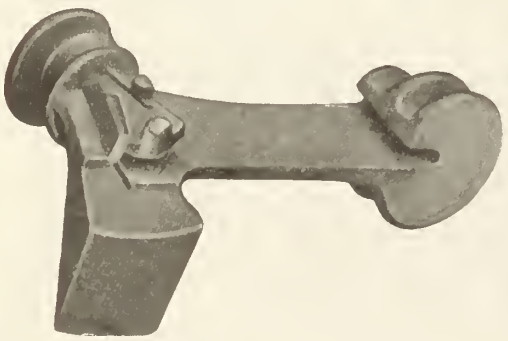

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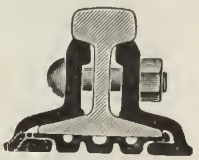

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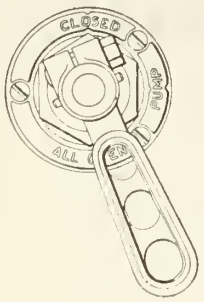

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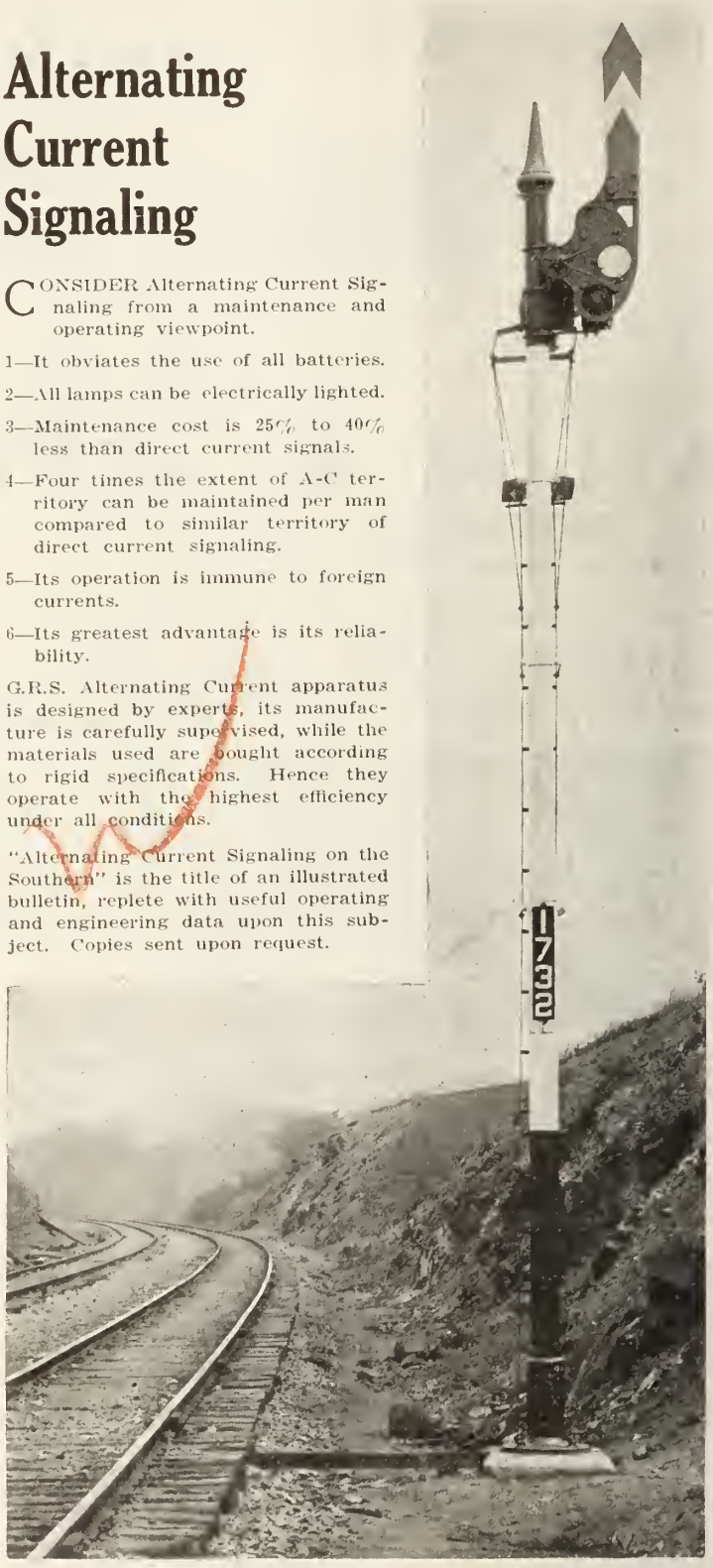

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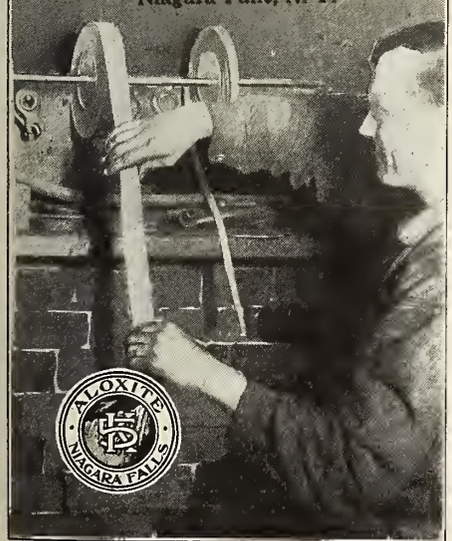

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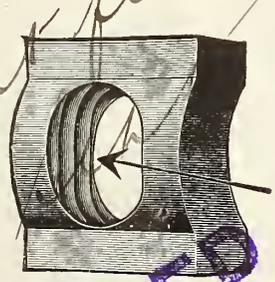

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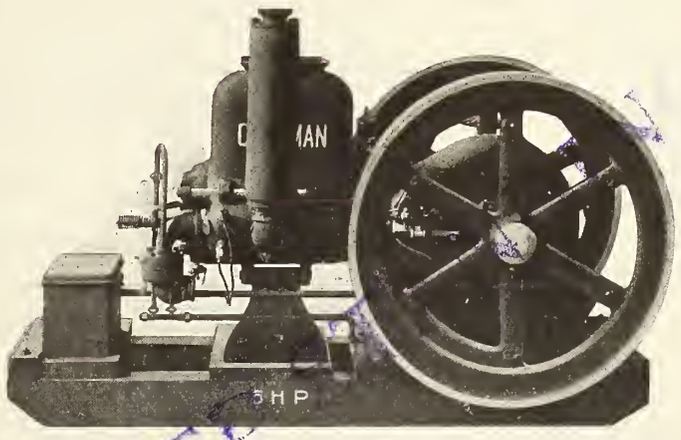

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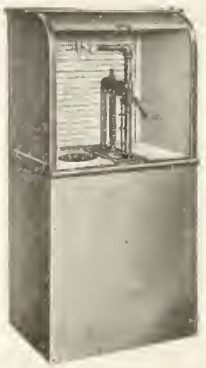

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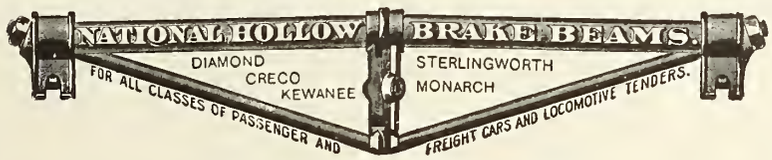

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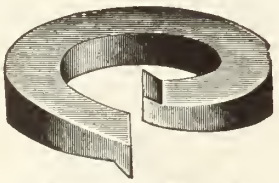

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E. F. Phillips Electrical Works
Standard Und Cable Co. of Can.
Steel Co. of Canada
WIRE, TRANSMISSION AND TROLLEY
Canada Wire & Cable Co.
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WRENCHES, CAST STEEL
Amer. Brake Shoe & Fdry. Co.
YACHTS
Polson Iron Works.

This New Pamphlet Should be in the Hands of Every Railroad Repair Shop Man —

Because it tells how the Thermit process of welding will save you thousands of dollars in repair costs.

Engine frames can be welded in place in from 10 to 24 hours. Many other sections, such as side rods, crossheads, etc., can be welded in a few hours time.

The process is now in use in over 430 railroad shops throughout North America.

Many useful drawings, tables and illustrations are shown in this new book, and will be of greatest assistance to all those engaged in Thermit welding.

If you have not as yet received a copy, write for one to-day.

This pamphlet is known as Pamphlet No. 2144, second edition.

GOLDSCHMIDT THERMIT COMPANY

WILLIAM C. CUNTZ, Gen. Mgr.
103 Richmond St. W., Toronto, Ont.
329-333 Folsom Street, San Francisco
90 West Street, New York
7300 South Chicago Avenue, Chicago

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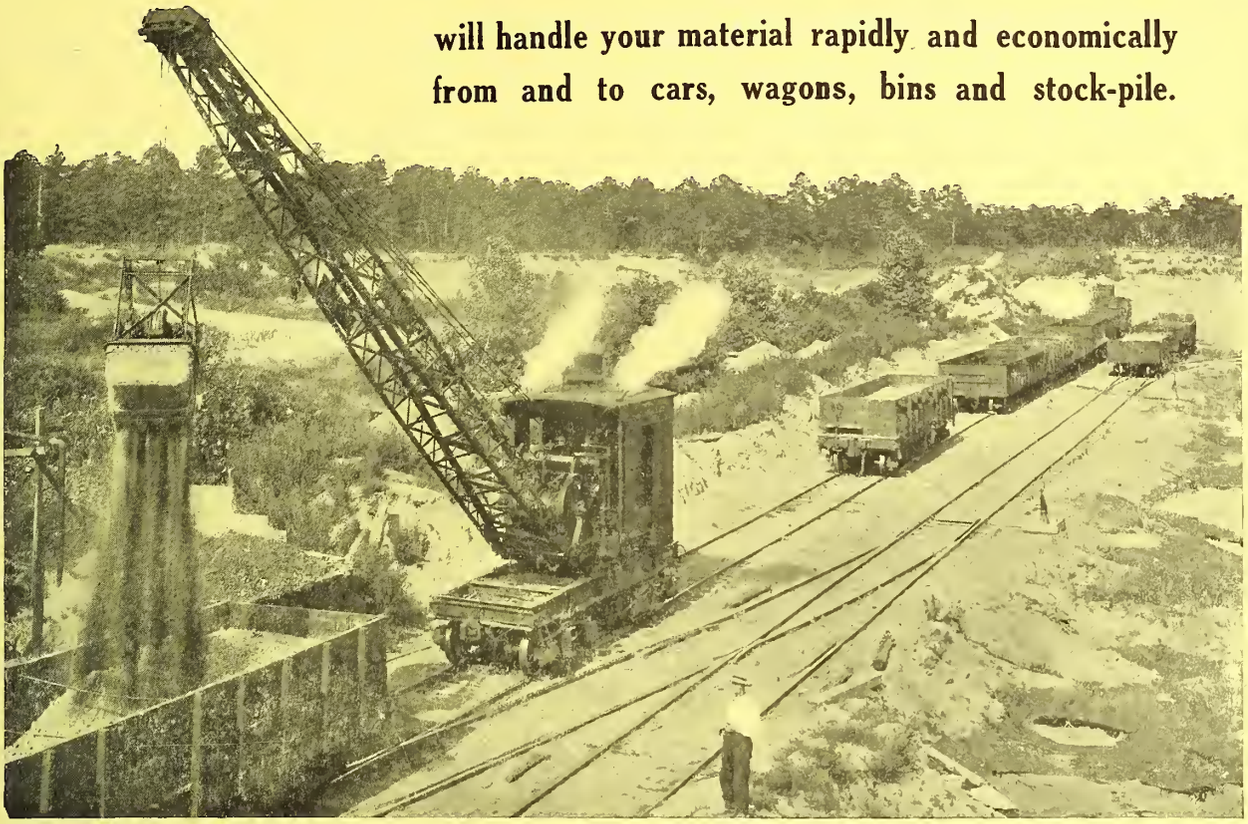
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

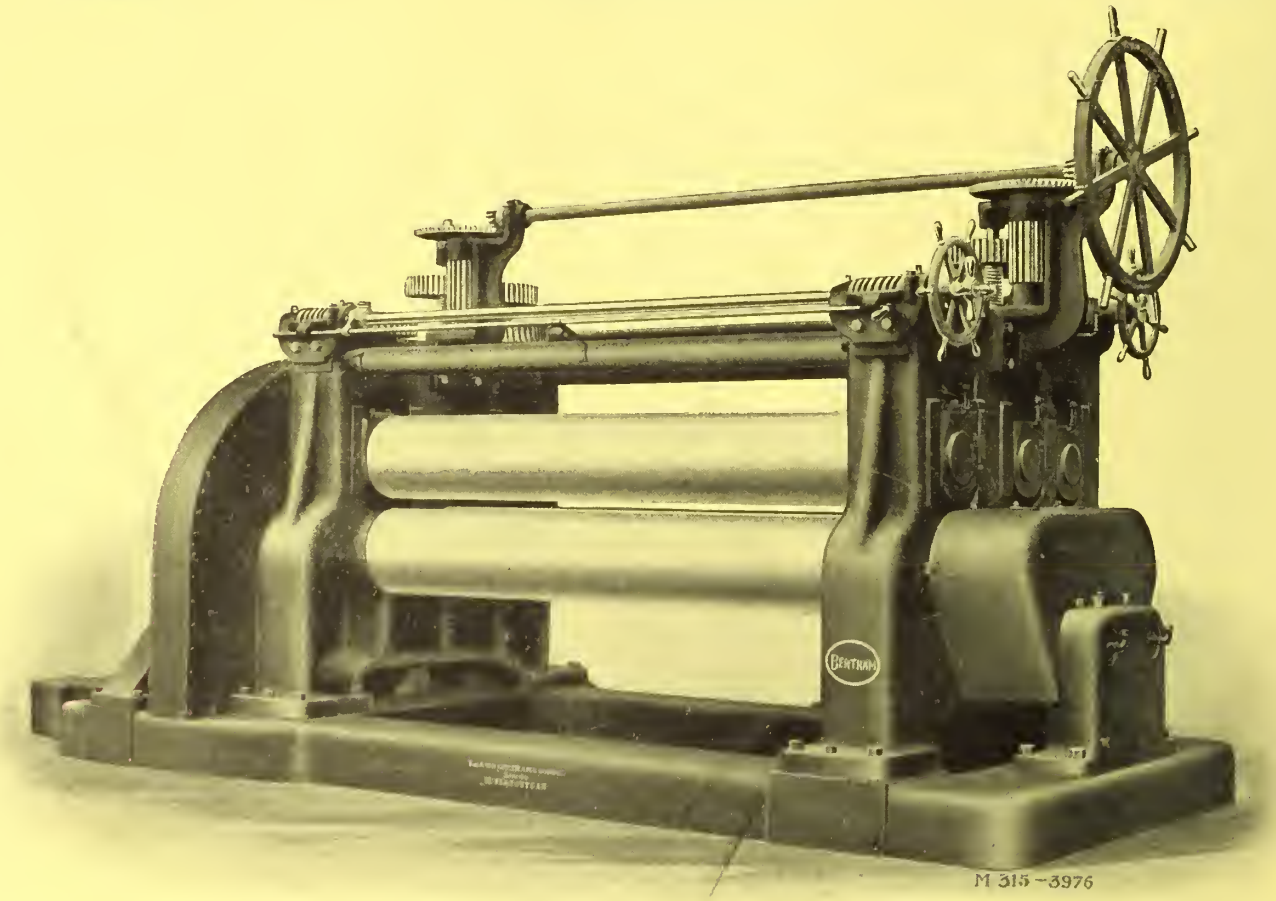
Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO, U.S.A.

CHANGE

Bending and Straightening Machines



SIX-ROLL PLATE STRAIGHTENING MACHINE

With Reversing Motor Drive.

Capacity for 7/8-inch plates 8 feet wide.

We build a complete line of Bending and Straightening Rolls for all classes of work. Specifications and photographs sent on request.

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

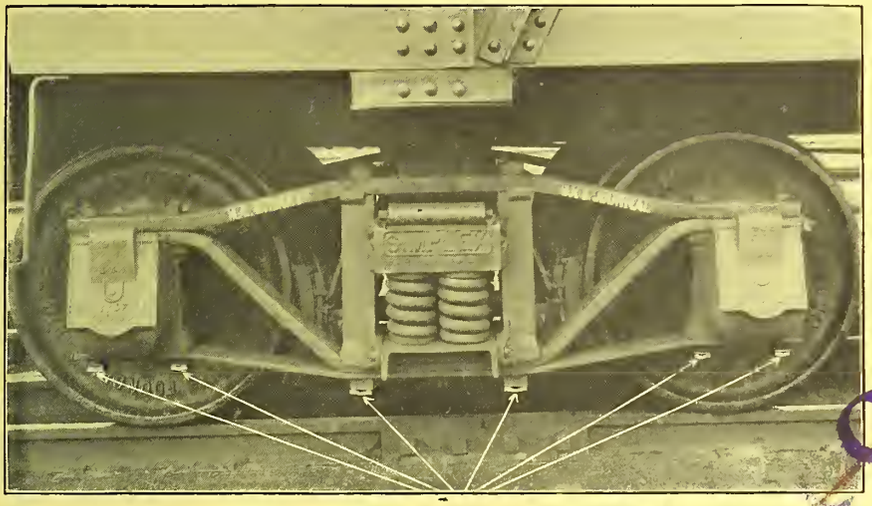
Agents: The Canadian Fairbanks-Morse Company, Limited

Offices: MONTREAL, TORONTO, WINNIPEG, VANCOUVER, CALGARY, SASKATOON, ST. JOHN.

Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 199 — TORONTO, CANADA, SEPTEMBER, 1914 — Subscription Rates Page 421



GRIP NUTS

The Sign of Safety

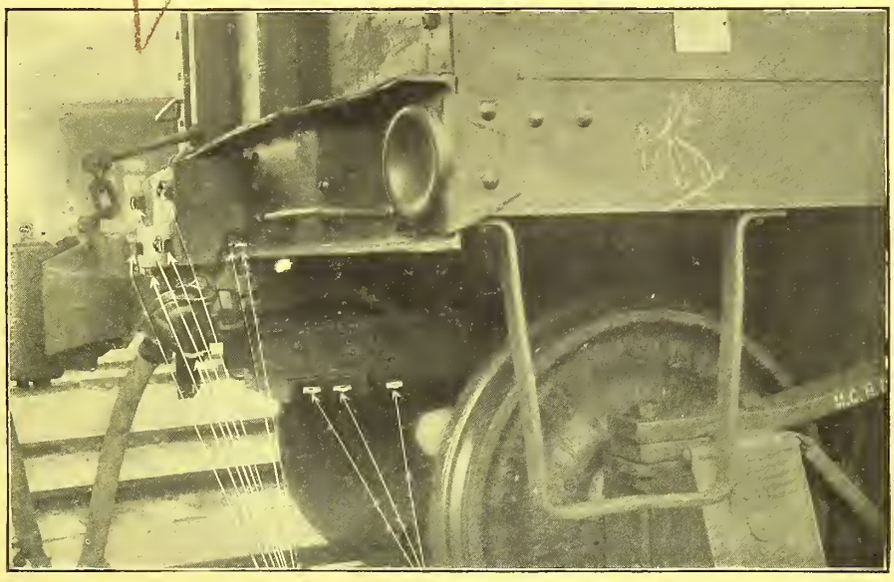
Look for This Sign in All Modern Equipment.

Wonderful Results Obtained from the Use of

GRIP NUTS

The By-word of All Railway Yards.

Let Us Explain.



GRIP NUTS

Canada Grip Nut Co., Limited

803 E. T. Bank Bldg., Montreal. — **Works, St. Johns, Que.**

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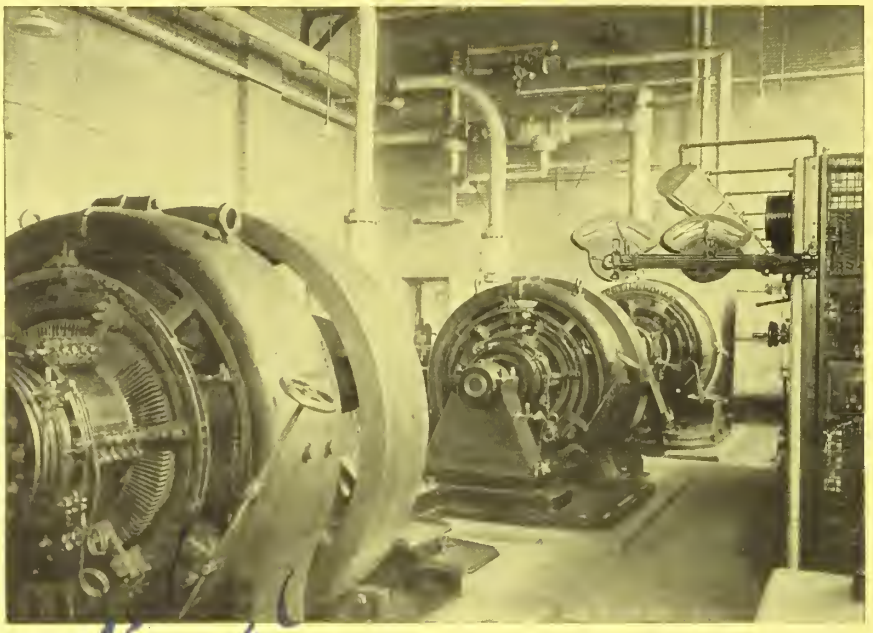


A Westinghouse Direct-Current Engine-Type Generator Installation.

Westinghouse

Direct-Current Engine-Type Generators

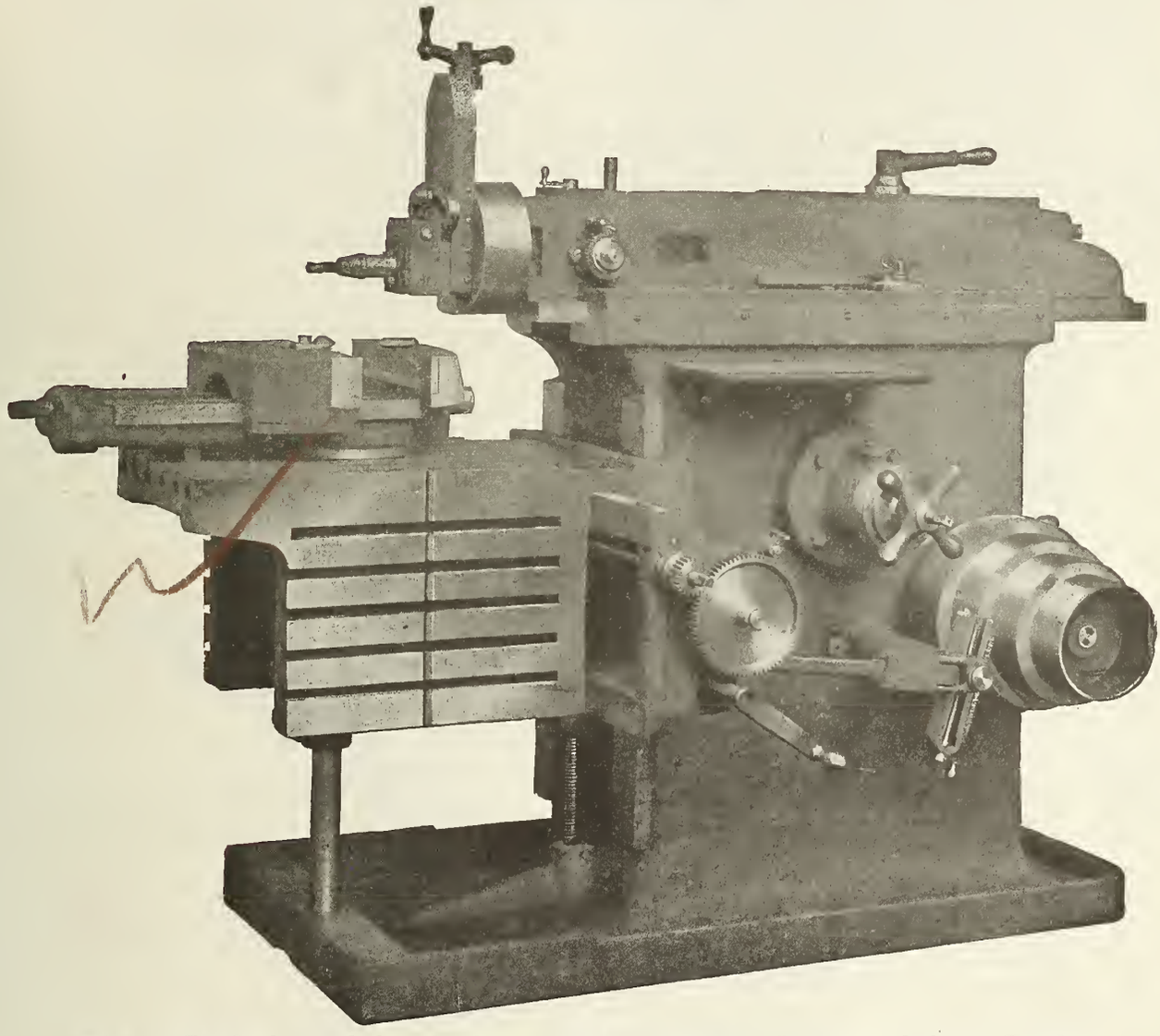
BUILT to meet the most exacting conditions. They will carry heavy momentary overloads without sparking. They are economical to maintain and stand up under long continued service.

Westinghouse Generator installations of 10 and 20 years ago are giving excellent service right down to the present time.

Canadian Westinghouse Co., Limited, Hamilton, Ontario

TORONTO	MONTREAL	OTTAWA	HALIFAX	FT. WILLIAM	WINNIPEG	CALGARY	VANCOUVER
Traders Bank Building	52 Victoria Square	Ahearn & Soper, Ltd.	Telephone Bldg.	Telfer Bl'g.	158 Portage Ave. East	Grain Exchange Bldg.	Bank of Ottawa Bldg.

SHAPERS C.M.C. SHAPERS



24 x 30 Back Geared Crank Shaper with Automatic Down and Cross Feeds.

Our shapers do **accurate** work at **high** speeds and with **heavy** feeds.

The substantial and rigid design together with careful construction make this possible, convenient adjustment handles with graduated collars enable the operator to produce more and better work.

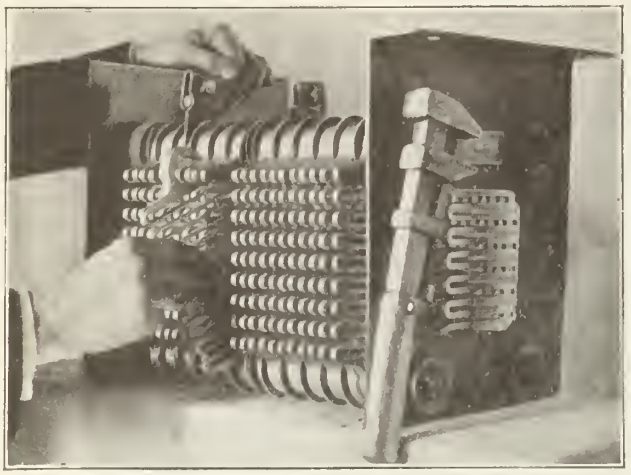
Our careful selection and inspection of materials ensures long life for the machine. Built in two sizes 16"x20" and 24"x30". Details of design and construction given in our Bulletins sent on request.

Representatives:—

QUEBEC: Williams & Wilson, Limited, Montreal. MANITOBA: The A. R. Williams Machinery Co., Ltd., Winnipeg

Canada Machinery Corporation, Ltd., Galt, Ontario

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.



Grids Are Easily Replaced.

Automatic Sectionalizing Switch.

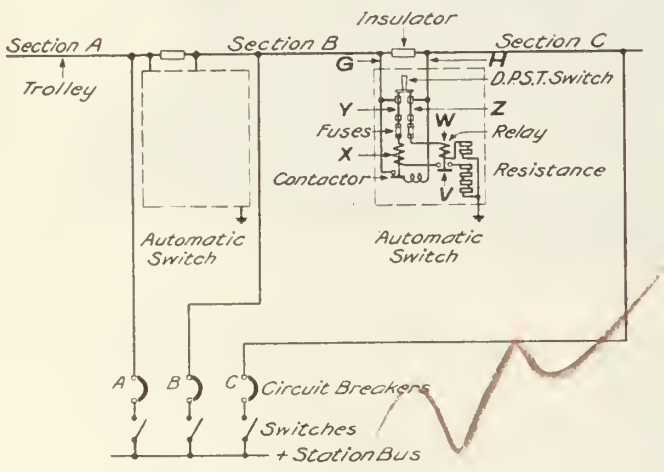


Diagram of Connections.

ELECTRIC RAILWAY SUPPLIES

A NEW RHEOSTAT

Our new "R.G." type of rheostat for electric railway service has many valuable features. A grid broken may be easily replaced without removing the rheostat from the car, thus saving the time which, with other rheostats, is required to dismount, dismantle, assemble and again mount on the car. The grids are supported top and bottom by means of slotted lugs, and the openings are designed so that the grids cannot drop out, but must be raised in order to be removed. To replace a grid it is only necessary to loosen the nuts of the supporting rods, when the grid can be removed and a new one inserted without the use of additional material. The test for each rheostat includes a potential of 5,000 volts between the frame and all of the grids.

SECTION SWITCHES

The Automatic Sectionalizing Switch, here shown, is designed to improve the efficiency of direct current feeder systems by permitting all section feeders to be placed in multiple. This is accomplished by connecting the switch directly across the section insulators, which, while giving all the advantages of the non-sectionalizing system, does not, in consequence of the automatic operation of the switch, do away with the beneficial results of the sectionalized system. Exchange current readings taken during rush hours have recorded as high as 600 and 700 amperes, with a resultant increase of potential of from 100 to 150 volts.

CHANGE

CONNECTIONS ON D.C. TROLLEY SYSTEMS

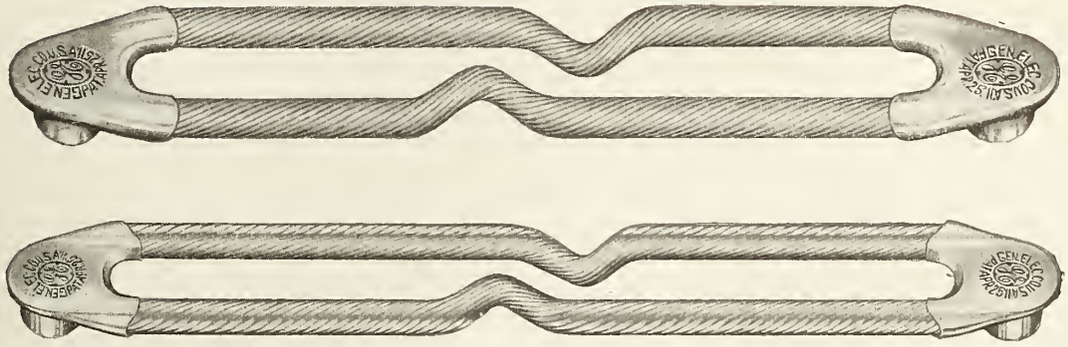
The switch is connected across the section insulator by the taps G. and H. Circuit breaker B. on being closed energizes section B. and current passes through tap G., switchblade Y., contactor operating coil X., to contact stud on relay, which is open circuited. On closing circuit breaker C., section C. is energized; current passes through tap H., switchblade Z., and relay operating coil W. to ground, closing the relay disk V. This in turn completes the circuit through the contactor operating coil X., causing the contactor to close and completing the circuit across the insulator, thus placing all feeders in multiple. Should cars become banked in any one section, current from the other sections will be fed across the section insulators, thus increasing materially the efficiency of the entire copper distribution.

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Some Vital Reasons Why You Should Use C-G-E Compressed Terminal Bonds



Compressed terminal Bonds — Installed with simple tools

- Soft copper studs; Large contact areas; Moisture proof contacts; High conductivity
  - Low contact resistance; Every one the same; Permanent results; lasting indefinitely
    - High efficiency
      - Millions in use
- Conductor strands protected by sleeves
  - Withstand more than a million vibrations
  - Repairs and renewals without interrupting service
    - Efficient operation
      - Low cost of maintenance
- Inexpensive equipment
  - Competitive bidding on bond and equipment
  - Small initial investments; Small interest on investment; Standard supplies easily obtainable; Low rental charges; No restricting clauses
  - Ordinary labor gives uniform and lasting results
    - Minimum cost per bond installed

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

LIDGERWOOD

SCRAPER BUCKET EXCAVATORS

FOUR LIDGERWOOD
BUCKET EXCAVATORS WORKING ON A DRAINAGE CANAL

The "LIDGERWOOD" SCRAPER BUCKET EXCAVATOR will make a complete revolution, will dig and deposit the load at any point within the circle, and will move by its own power, being mounted either on hardwood rollers, truck wheels or trucks, as elected by the purchaser.

The machine is especially adapted for open cut work of all descriptions, sits on top of its work, and either backs away or moves forward upon the filling accomplished by it. Is especially adapted to digging irrigation and drainage ditches, making railroad embankments and levees, stripping overburden from and digging gravel, coal, phosphate matrix, iron ore, placer mining, etc. Will dig under water. Can be equipped with either steam or electrical power, and is operated by patented Pneumatic Control of frictions. Can be used in a revolving derrick or pile-driver.

Exclusive Agents in Canada

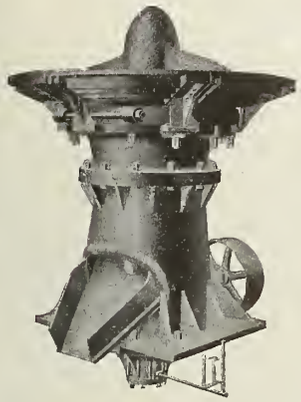
CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

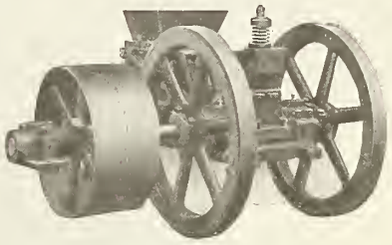
Contractors' Equipment

Rock Crushing Plants with Gyratory or Jaw Breakers, Screens, Elevators, Conveyors and Power Equipment. See Bulletin 1411.

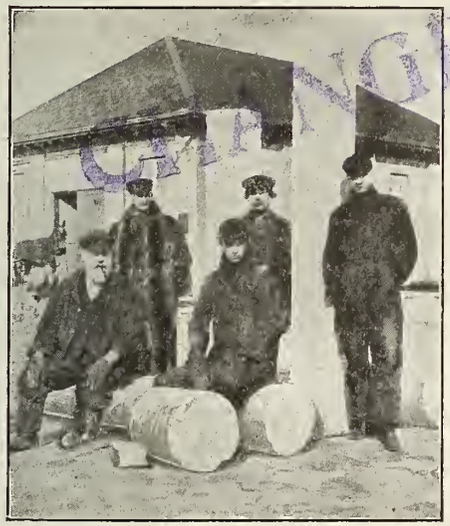


Gates' Breaker.

The Dodge Sectional Crusher has openings 7 x 9 but no piece exceeds 170 lbs. except the swing jaw 280 lbs. and 2 frame sections 250 lbs. each. See Bulletin 1451.



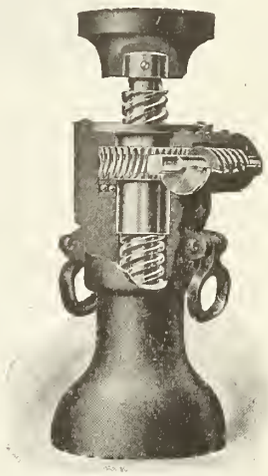
Dodge Sectional Crusher.



16-in. Limestone Cores.

In connection with the construction of new steam or electric rail ways, or with the development and extension of older properties, the **McKiernan-Terry Core Drill** has been found of remarkable utility. It is used for test borings, either for the purpose of road-bed construction or for determining the position of anchorages and piers for bridges.

The McKiernan-Terry Atlas Jack can be elevated to one-thousandth part of an inch **and remain elevated with the load for any length of time.** This feature has been highly commended by contractors having delicate shoring operations to do, and their statement that when the Atlas has raised its load it would be found in the same position months afterward, is sufficient proof of the claim.



Atlas Jack.

Exclusive Agents for Canada.

CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

What Do You Really *Know* About The Simmen System of Signaling

Did you ever talk about it to any responsible official of any of the high-speed interurban roads using the Simmen System?

Did you ever ride on a car protected by this System? And see the cab signal constantly staring the motorman in the face—see it change from green to red and back to green again?

Have you ever sat at a Simmen Dispatcher's Table and watched the automatic recording of the movements of every train? Seen the dispatcher stop a train at a given point by simply pushing a lever?

Have you ever examined the interlocking feature on the dispatcher's levers which prevents him from giving clear signals to opposing trains?

Have you ever had definite authoritative figures on the cost of installation and operation of the Simmen System?

How can you judge of the value of the Simmen System without thoroughly investigating its workings and cost?

You can make such an investigation easily and conveniently. Do it.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

Canadian Locomotives

for contractors, industrial works, railroads, etc.

CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 10 tons. Weight of tender in working order 150,000 lbs.

All locomotives are equipped complete with fittings, fixtures, tools and all appliances necessary for their operation.

If desired, we will furnish with all tenders on standard locomotives, complete detailed specifications, fully describing all construction features, with the various sizes of dimensions noted. Specifications can also be accompanied by photographs showing the type of locomotive proposed, with any modifications clearly mentioned.

We have had a half century's experience which may be useful to intending purchasers in selecting locomotives suitable for peculiar conditions, or where roads are not fully completed or surveyed.

Our plant is now being greatly enlarged. New equipment has been installed and the capacity of the works brought up to an output of about eighteen locomotives a month, which will soon be increased to twenty-five a month. Consult us before purchasing a locomotive!

We are also builders of stationary boilers suitable for contractors or industrial plants.

Canadian Locomotive Company, Limited

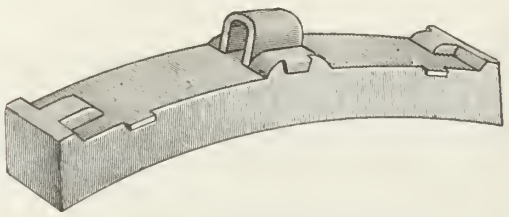
Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly.

New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

Our Improved Reinforced
BRAKESHOES

For All Classes of Steam and Electric Cars.



RAILWAY BRAKESHOE

Locomotive Driver and Truck Shoes For All Types.

WE ARE NOW TURNING OUT BEST QUALITY

STEEL AND BRONZE CASTINGS

IN OUR ELECTRICAL FURNACES

We Specialize in M.C.B. Standard Journal Bearings.

CHANGE

For Freight and Passenger Cars. Also all kinds of Engine Brasses.

THE CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.

25 - ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.

35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

Canadian Brakeshoe Company, Limited

Sherbrooke, Que.

Sole representatives for the sale of our Brakeshoes in the Dominion of Canada outside British Columbia, Messrs. Taylor & Arnold, Montreal and Winnipeg. The Province of British Columbia, The B. C. Equipment Co., Vancouver.

1600 Bonds Stolen!

We heard of one traction company having this number of bonds stolen from their rails. No one blames THEM for being greatly incensed at it, to say the least.

The Surprising Thing

is the fact that there are dozens of roads from which an equal or greater number of bonds have been worse than stolen by the corrosive effect of moisture, and THEY are not saying anything about it.

Perhaps they don't know it. Electric Weld Rail Bonds do not corrode at the terminals.

The Electric Railway Improvement Co.

2070 East 61st Street,

Cleveland, Ohio

Warm Days --- Cool Nights

OCEAN

RIVER

NOVA SCOTIA

NEW BRUNSWICK

PRINCE EDWARD ISLAND

QUEBEC

Boating
Bathing
Yachting
Fishing
Tennis
Golf

Every Summer Enjoyment

LAKE

STREAM

Are described in a beautifully illustrated book of 300 pages.

"Summer Provinces By The Sea"

Send 15c in stamps to
General Passenger Agent,
Canadian Government Railways,
Moncton, New Brunswick.

EDISON
EBSCO
PRIMARY BATTERY
FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

RSA Cell, 400 Ampere Hours Capacity.

Since automatic signals provide the most efficient traffic protection, it is usually desirable to make the funds available for signaling cover the greatest possible mileage.

While the miles of track that can be protected for a given amount depends, to a certain extent, on local conditions, the selection of the method of generating the energy for operation is of vital importance in reaching a satisfactory solution.

Edison Primary Battery makes possible the installation of a signal system at a cost per mile much lower than if any other current source of equal reliability is used. Its dependability is attested by the thousands of miles of automatic signals that are now being operated by the Edison cells. It provides economical maintenance, the cells requiring attention only once a year on the average road and it broadens the field from which maintainers can be obtained as compared with the more involved power systems.

RSA Barrel Shaped Cell, 400 Ampere Hours Capacity.

Correspondence solicited. Catalog on request.

The Cheapest Form of Battery Energy

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

Canadian Consolidated Rubber Company Limited

T. H. Rieder, Vice-President and General Manager.

***Executive Offices,* Notre Dame Street, MONTREAL, P.Q.**

Selling Agents for

Dominion Tire Company, Limited, Berlin, Ont.
The Canadian Rubber Company of Montreal, Limited, Montreal, Que.
The Granby Rubber Company, Limited, Granby, P.Q.
The Merchants Rubber Company, Limited, Berlin, Ont.
The Berlin Rubber Manufacturing Company, Limited, Berlin, Ont.
The Maple Leaf Rubber Company, Limited, Port Dalhousie, Ont.
Dominion Rubber Company, Limited, St. Jerome, P.Q.
Berlin Felt Boot Company, Limited, Berlin, Ont.

Rubber Goods Best by Test for All Purposes

Air Brake Hose (regular) and Special "Nonfreezing" Air Signal Hose
Steam Heating Hose
Vacuum Hose
Hot Water Hose (White)
Cold Water Hose
Air Hose—for Drills and Pneumatic Tools
Hose Bags—Corrugated
Heavy Suction Hose
Wire-lined Gas Hose
Fire Hose and Supplies
Hose for every special use

"Star" Red Sheet Packing
"Canadian" Spiral Packing
Pure Gum Sheet
Valves—For Hot and Cold Water (all densities for any pressure)
Pebbled (Dot) Rubber
Moulded Mats
Hammer Bumpers
Air Brake Gaskets
Special Moulded Goods for every mechanical use
Tubing—all sizes
Rubber Strips

Rubber Boots and Shoes

"Jacques Cartier," "Merchants," "Dominion," "Anchor," Brands.
Fleet Foot Outing and Sporting Shoes. Felt Boots and Specialties "Berlin" Brand.

Automobile Tires Truck Tires Carriage Tires

Original "Diamond" design Inlaid Rubber Tiling. Estimates and samples cheerfully furnished. We specialize in Rubber Goods required by Steamboat and Electrical Car Companies. Write for catalogues and prices.

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Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

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Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

Tests and Correspondence Solicited.

S. A. MEGEATH,
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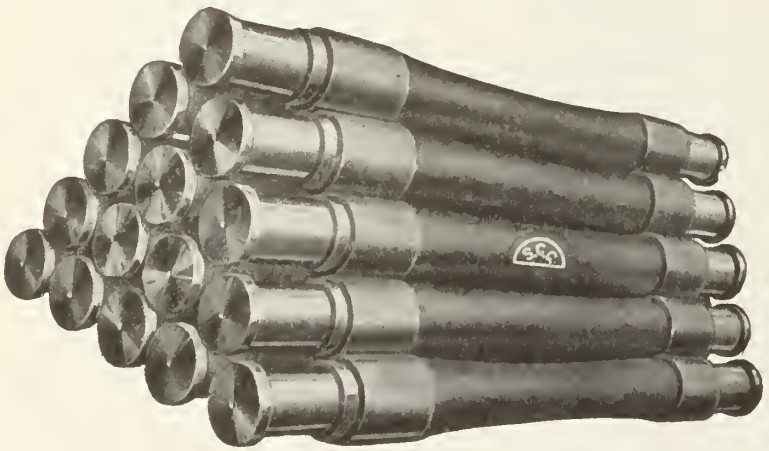
HAMILTON, ONT.

Forged Steel Axles



We are prepared to furnish all kinds of forged steel axles for cars, freight, passenger and electric, and for locomotives, including drivers, engine trucks or tender trucks.

We Carry a good Stock of

Railway Track Equipment

including

Track Bolts **Track Spikes** **Tie Plates** **Angle Bars**

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Wire, Wire Nails, Staples, Screws, Rivets, Putty
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Is the Most Practical, Efficient and Economical Means of Improving the Quality of Open-Hearth Rail Steel

This fact has been demonstrated in service, in the mills and by chemical, physical and microscopic examination.

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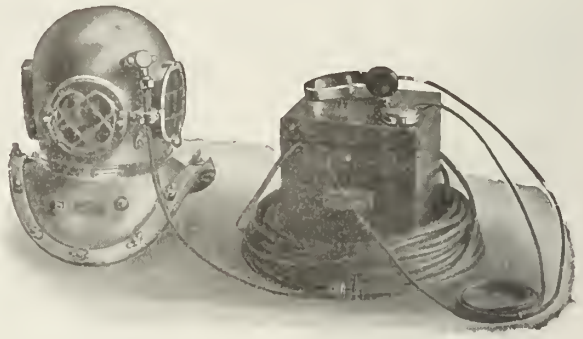
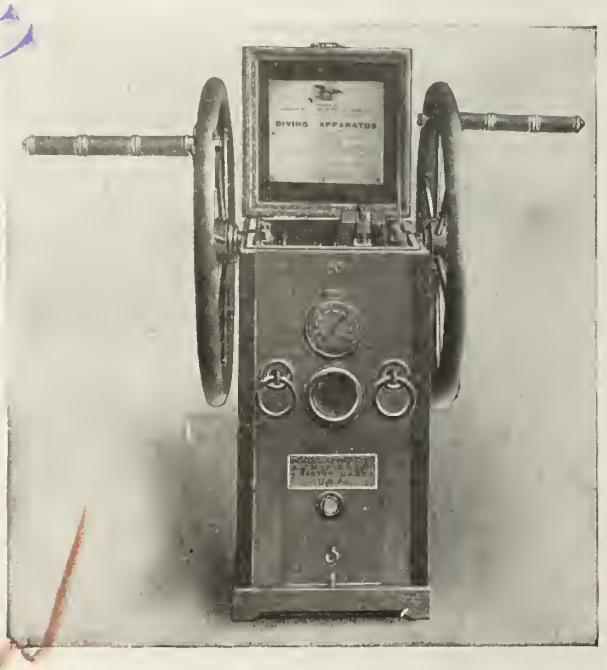
Morse Air Pumps Range in Capacity from a Few Feet to Over 200 Feet Depth of Water.

Morse Diving Dresses are Made of the Best Material and are Reinforced Where Exposed to Most Wear.

Morse Diving Helmets are Especially Designed for Comfort and Safety.



Submarine Telephone Outfit



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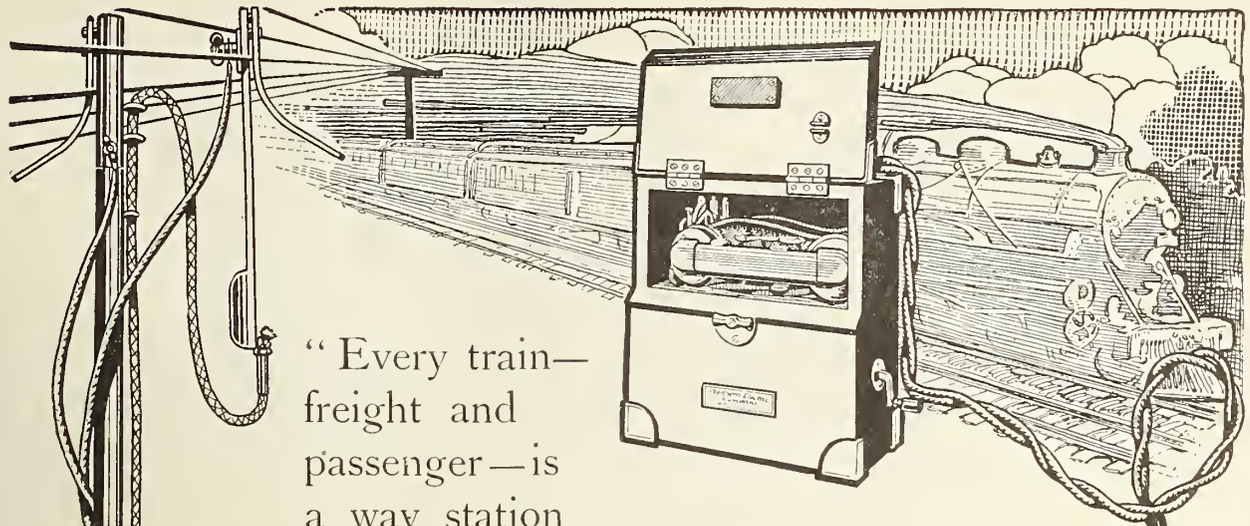
10th Ave. and 3rd St. East	101 Water St.	142 Peter St.	78 Granville St.



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PORTABLE TELEPHONES

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"Our dispatchers," continued the railway superintendent, "have practically every foot of the line under observation. Those portables help a lot."

They will help you on your lines.
Let us quote you.

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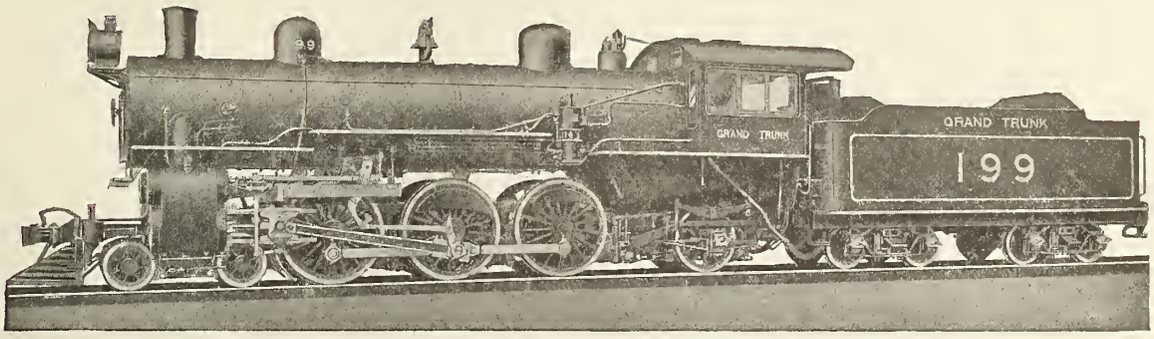
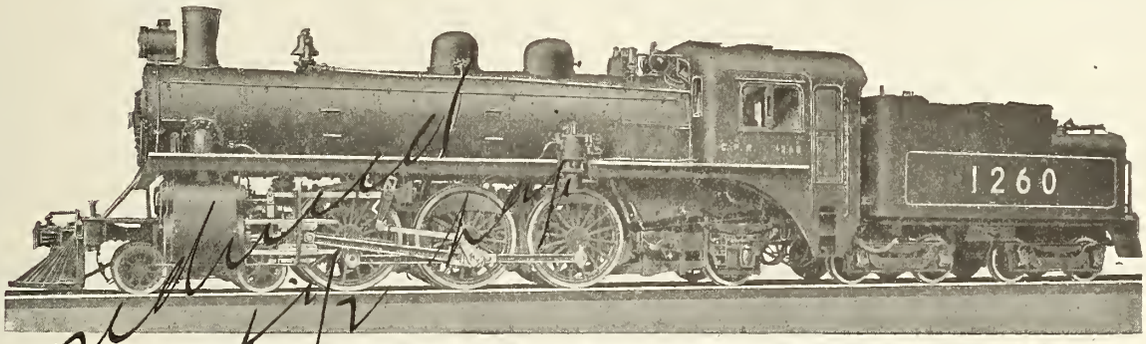
FOR FAST PASSENGER SERVICE



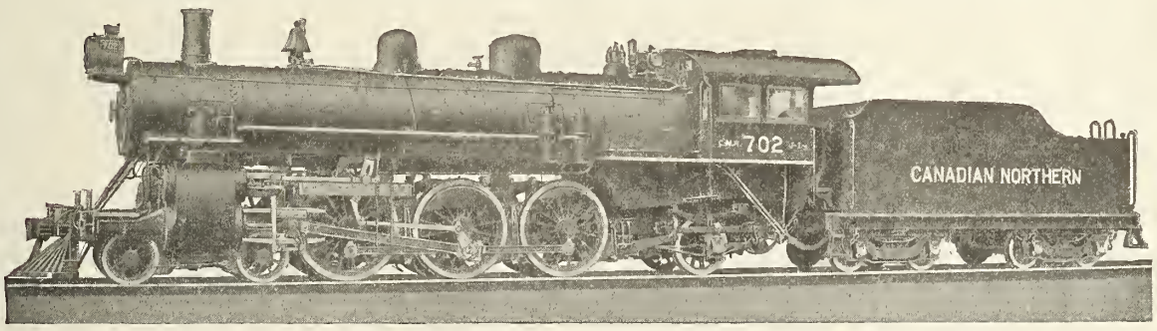
PACIFIC TYPE LOCOMOTIVE BUILT FOR GRAND TRUNK RAILWAY.

Total Weight of Engine, 226,000 pounds; Weight on Drivers, 145,500 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 185 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power, 33,900 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN PACIFIC RAILWAY.

Total Weight of Engine, 223,000 pounds; Weight on Drivers, 142,000 pounds; Diameter of Drivers, 70 inches; Boiler Pressure, 200 pounds; Cylinders, 22½ x 28 inches; Maximum Tractive Power, 34,500 pounds.



PACIFIC TYPE LOCOMOTIVE BUILT FOR CANADIAN NORTHERN RAILWAY.

Total Weight of Engine, 216,000 pounds; Weight on Drivers, 136,400 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 170 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power, 31,100 pounds.

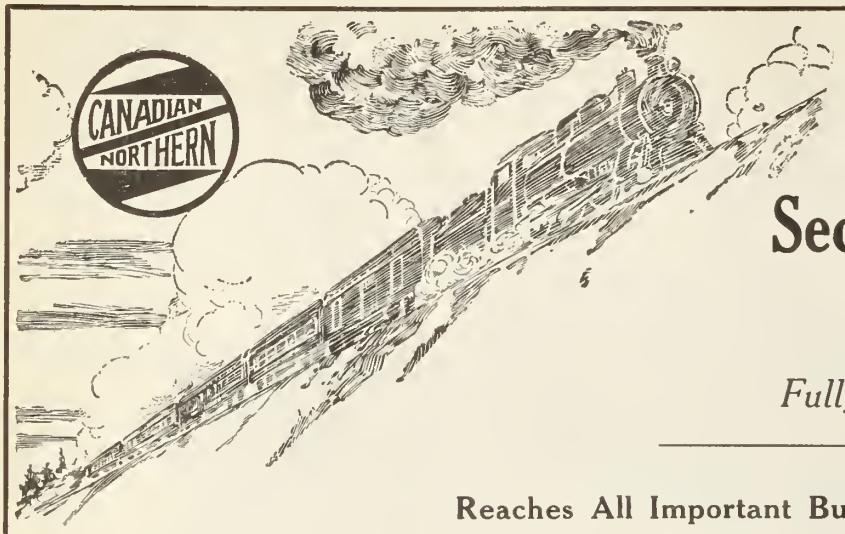
These locomotives represent the combined knowledge and experience of the officials of the roads and builders.

They were designed and built to fit the physical and operating conditions of the roads.

They include only features which have been thoroughly proven in service, skillfully combined in proportions known to be correct.

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA



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Solid Vestibuled Trains
Fully Equipped Dining and Parlor Cars

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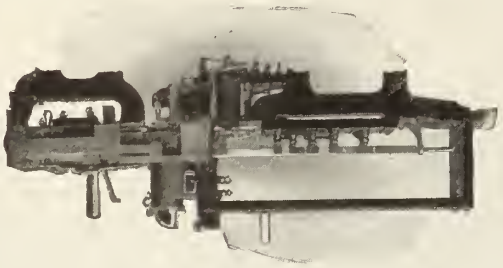

NOW it is the HALL ELECTRIC INTERLOCKING

Because that apparatus offers safety features that are found in no other. Alternating current control of return indications is safer than using the same kind of current for operating functions. Double protection is secured by using a higher voltage for the return than is used for the operating.

It is of unit construction. Levers may be removed or added without interference with the others.

HALL SWITCH AND SIGNAL CO.

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Montreal Works: **Garwood, N. J.** **Chicago**

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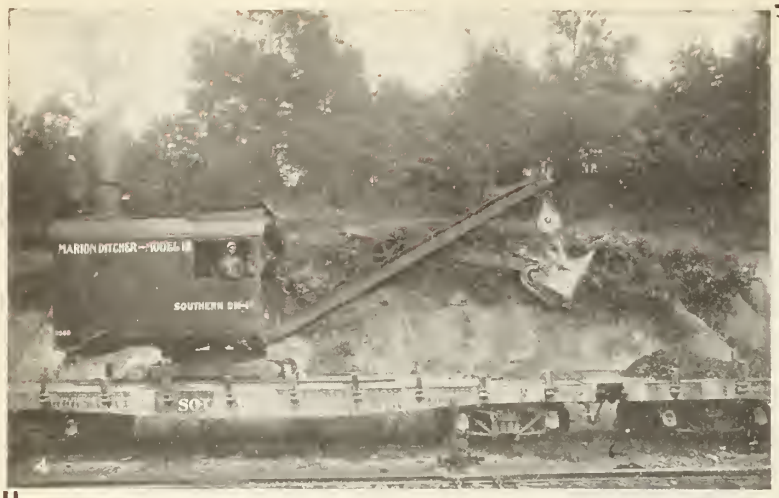

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are specially designed for cleaning out or widening old ditches or cutting new ones along the right-of-way

Exclusive Features

Several exclusive and invaluable features are embodied in all Marion Railroad Ditchers. Three independent sets of engines for governing the hoisting, swinging and thrusting motions. Ditchers are equipped with boom raising and lowering device.

MADE IN TWO SIZES — ILLUSTRATIONS AND FULL PARTICULARS UPON REQUEST

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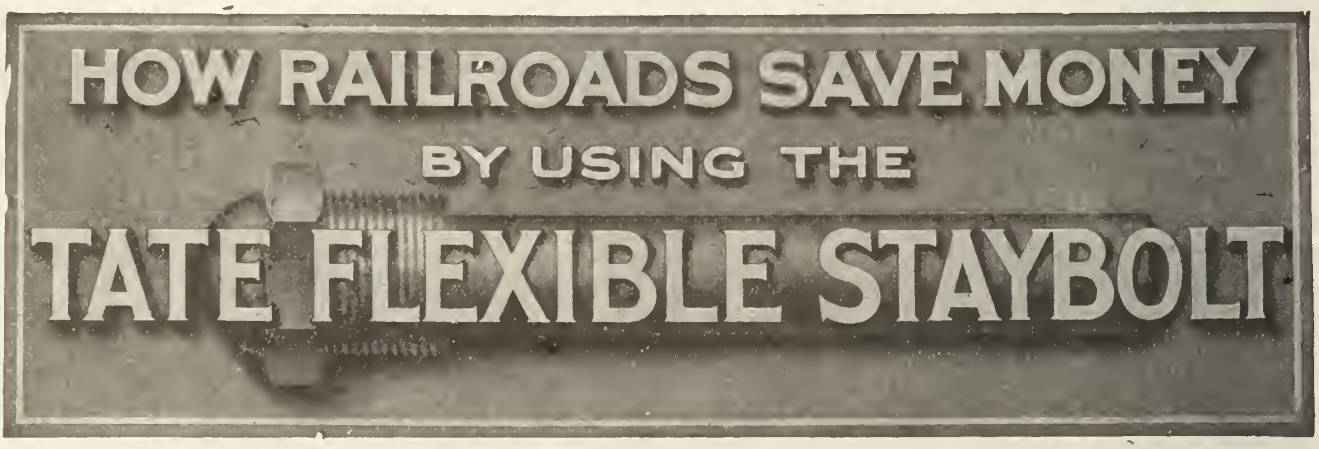

TIME HAS DEMONSTRATED

FIRST—That flexible staybolts produce more satisfactory and more economical results than rigid staybolts.

SECOND—That TATE FLEXIBLE STAYBOLTS are best of all, measured by every standard.

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– PATENTED –

Always Ready for Use

One Man Operation

Quickest and Easiest Operated Car Built

Built in Any Size or Capacity

All Steel Composite or Wood

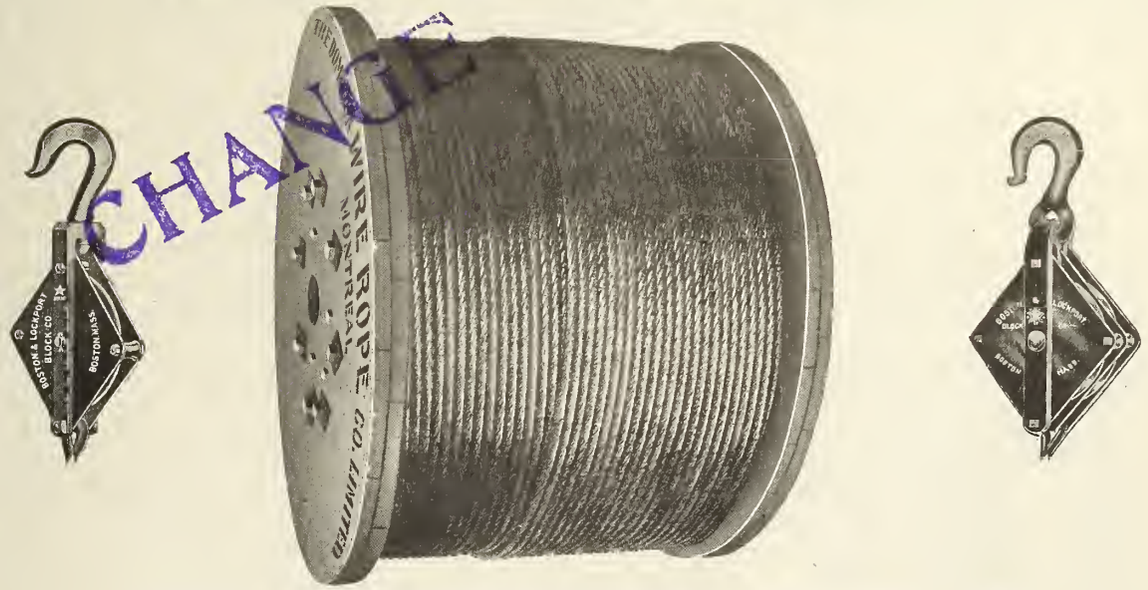
For Standard or Special Service

Thousands in Use

THE MOST PRACTICAL CAR FOR ALL BULK FREIGHT.
A DUMPING GONDOLA FOR ALL SERVICES.

THE HART-OTIS CAR CO., LIMITED : MONTREAL

Why Go Elsewhere for Your Wire Ropes When You Can Buy Them in Canada?



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Enamelled iron signs are ideal for station name and station door signs.

They are much superior to a painted wooden sign, which has to be repainted at frequent intervals, and they last a lifetime.

There is absolutely no wear to them, and we guarantee that they will not fade or be affected by the weather in any way.

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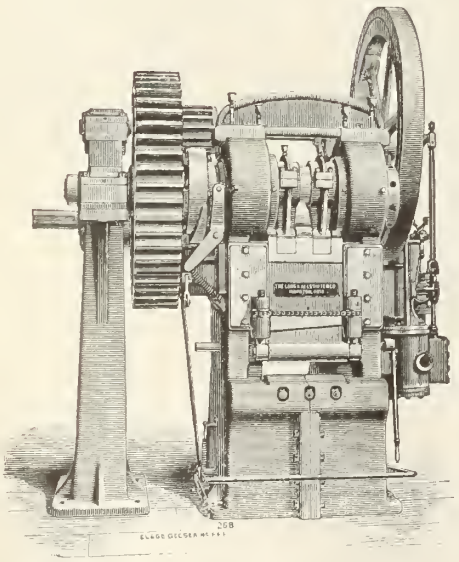

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Hamilton, Ohio, U. S. A.

Riveting Machines — Tire Welding Machines

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The Safety Car Heating and Lighting Company

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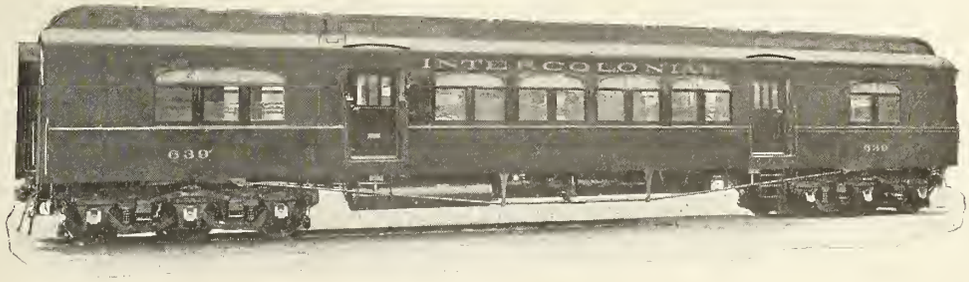

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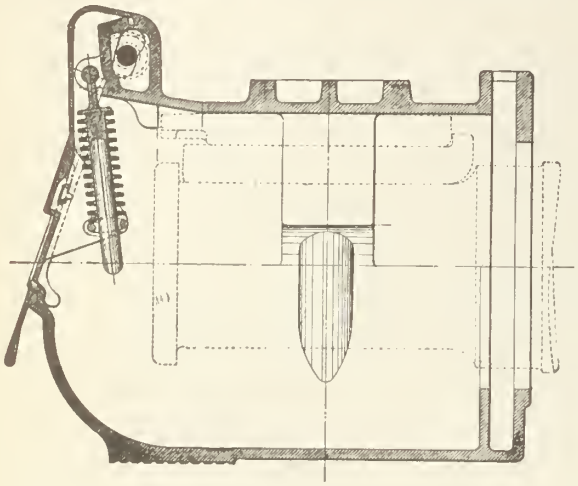

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FAST TRAIN FROM COAST TO COAST

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The Canadian Pacific can ticket you around the World, and enable you to travel over two-thirds of the World's journey on their own trains and steamships.

Those contemplating a trip of any nature will receive full particulars and literature from any C. P. R. Ticket Agent, or write

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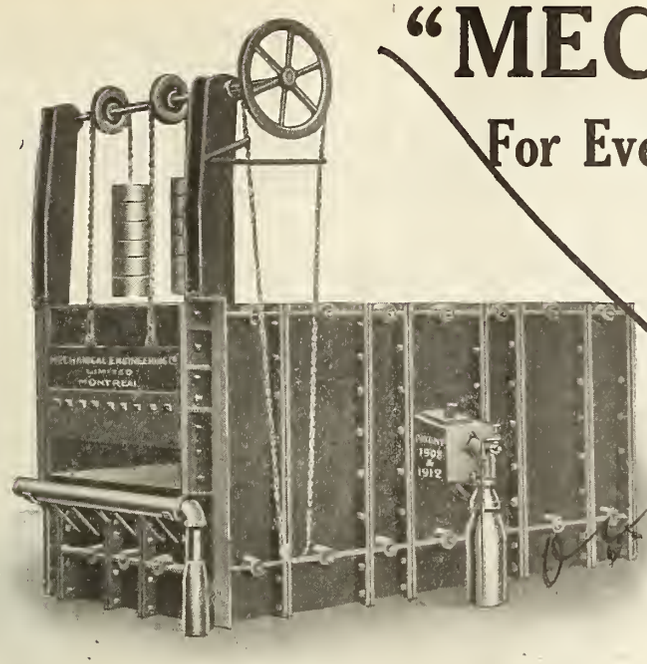

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Designed for Natural or Producer Gas, Oil, Coal or Coke as fuel.

Canadian Agents for R. D. Wood & Company's Gas Producers.

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WIRES AND CABLES

BARE and INSULATED WIRES, RAILWAY and POWER FEEDER CABLES in Copper or Aluminum. COPPER TROLLEY WIRE COPPER CLAD WIRE (Duplex Metals) GALVANIZED STEEL STRAND GUY WIRE.

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Until YOU have had an opportunity of trying them out at OUR expense.

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Catchers
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Wheels
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If you are really interested in a strictly "*non-obligating*" proposition, fill in the coupon. It costs you nothing.

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Gentlemen: What is your "non-obligating" proposition?

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"Hot Boxes" and "High Spots"

can generally be traced to the use of inferior or worn-out files.

With a NICHOLSON-MADE-FILE your workman doesn't need to "get the hang." The file he gets to-day is exactly like the ones he used last week—or the ones he will get next month.

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Our complete control over every step in file-making—from raw steel to finished file—insures absolute uniformity in NICHOLSON-MADE-FILES. They cut deepest—last longest—give maximum service.

And by teaching your men to use two files where they now use one, you cut your filing cost 25% to 50%. What you save in time and labor pays many times over for the extra files.

Try the "Use-More" plan to-day with NICHOLSON-MADE-FILES. Let their saving tell the story.

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"FILE FILOSOPHY"—A 50 years' education on files in an hour, and our Catalog, sent FREE on request.

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Such thorough, scientific handling of bad water propositions alone insures constant and uniform results in the prevention of scale, corrosion, pitting and foaming.

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Fairmont Motor Cars Are Used For Many Purposes

other than track work. The engines, being controlled so successfully by our patented governor, can be run at any speed required for any class of work. The two pictures shown here will give you an idea of their adaptability.

Everywhere you go you will find Fairmont cars and engines —and they are always working. Roadmasters, bridge builders and section men in every State in the Union, in Canada and in Mexico are using them. No other machine has become such a universal favorite.

Beaumont, Texas, May 12, 1914.

Fairmont Machine Co., Fairmont, Minn.

Gentlemen:—I now have seven of your 5 h.p. motor cars on my division and I wish to advise you that we are all highly pleased with them. There is no question about their speed, power or reliability. We pull two push cars with 20 ties and 25 men at a time and make 18 to 20 miles an hour. I wish to say also that my 3 h.p. inspection car gets better all the time and I wouldn't be without it.

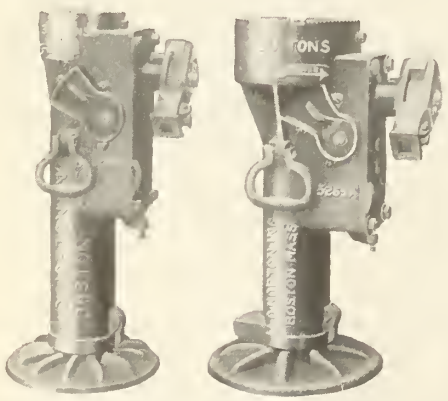
Yours truly,
W. S. VAN DORN, Roadmaster.

In addition to our motor cars, we build engines especially designed for the use of men who wish to build their own cars. Engines for this purpose are mounted on a plank the length of an ordinary hand car, and are furnished complete with everything needed—belt, pulleys, batteries, spark coil, spark plug and wrench, and a half gallon of lubricating oil. The outfit can be installed on a car in less than two hours.

We will be pleased to give you all information about our cars and engines, together with prices and our easy payment plan, if you will send us your name and address.

FAIRMONT MACHINE CO.,
DEPT. W., FAIRMONT, MINN., U.S.A.

NORTON SELF LOWERING JACKS ARE THE FASTEST JACKS MADE



No matter what ANYONE says.
You can prove it by trying them beside any other make.

When load is raised, *your work is done.*

You do not have to crank or pump the load down as with other Jacks. Just "press the button" and the Jack lowers its full load with *absolute safety.*

Send for complete Catalogue and Discount. 35 and 50 Tons Capacity. Plain and foot lift.

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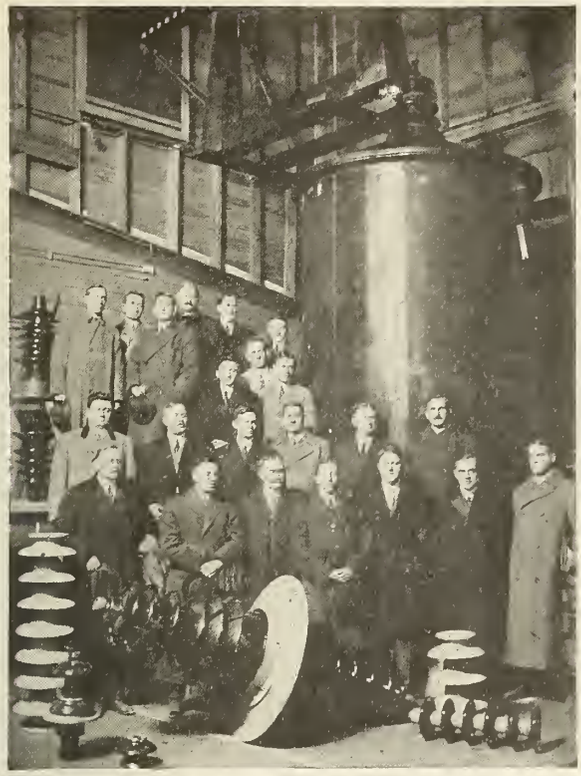

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Stand for Quality

All possible care is exercised and the best equipment used to give to users the maximum of service.

Illustration shows our large testing transformer. It is rated at 200 K.V.A. and has a maximum voltage capacity of 600,000.

Large wall bushing in foreground is for 150,000-volt service and has a dry flashover of approximately 375,000 volts.

See page 243 to 396 of new Catalog No. 14 for complete listing of O-B Insulators and accessories. There's an O-B Insulator for every condition.

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2,000 feet above sea level.

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Furnishes splendid hotel accommodation. Rates $2.50 to $3.00 per day; $16.00 to $18.00 per week.

In addition, Camps "Nominigan" and "Minnesing" offer novel and comfortable accommodation at moderate rates.

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View of Standard Type Baggage Car Recently Completed on Order of Grand Trunk Railway.

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Once said that an applicant for a position as motorman on one of their electrified divisions gave as one of his qualifications the fact that he had successfully repaired the electric bell system at home on the farm and saw no reason why he couldn't handle the job.

That man had no idea of the training necessary to fit himself for the service he would be expected to render.

In our organization every man has to first be qualified by experience and then becomes a factor in our own particular system of training. Each workman on passenger equipment is trained to know his work well and whether or not it will pass our inspection.

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Canadian Railway and Marine World

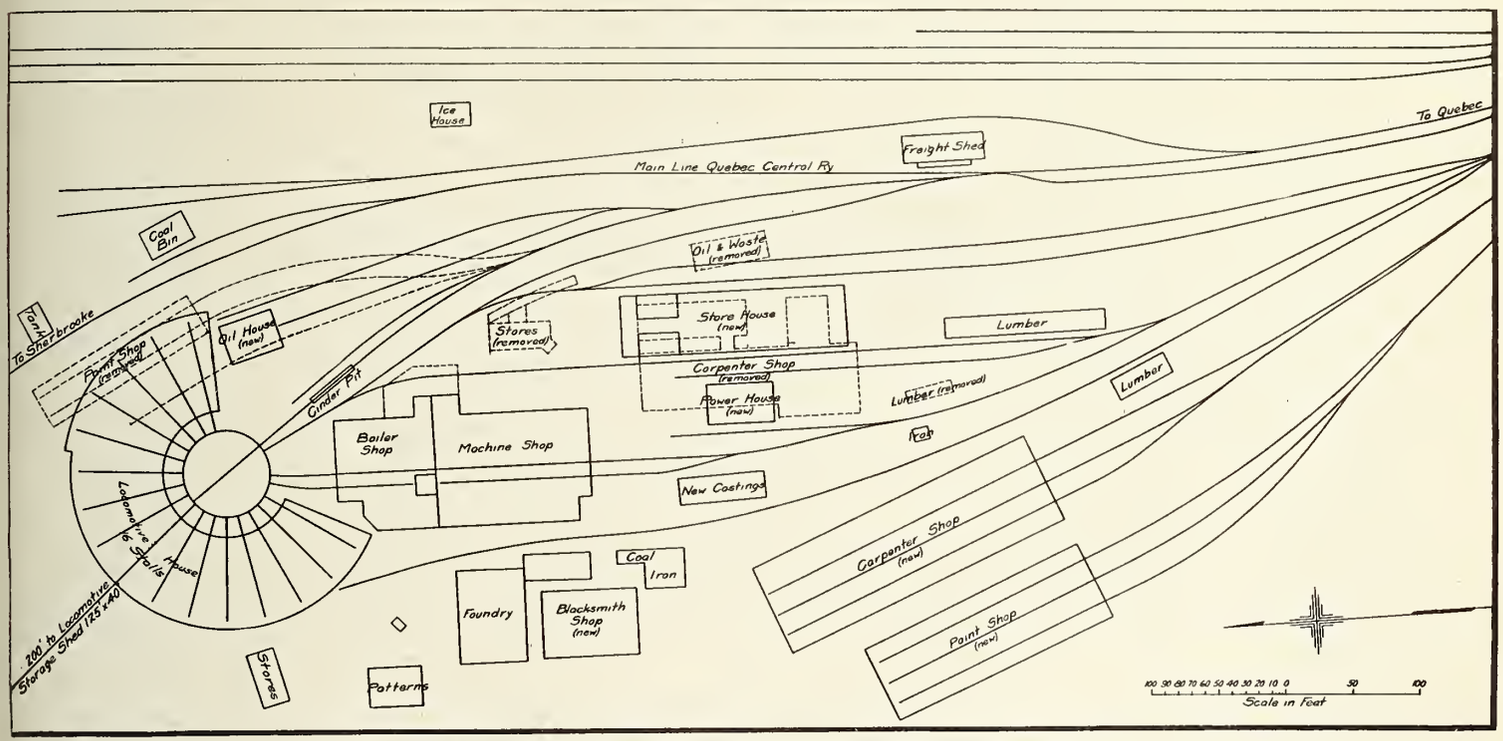
September, 1914.

The Quebec Central Railway Shops at Sherbrooke.

During the past year, extensive alterations and additions have been made to the Quebec Central Ry. shops at Newington, a suburb of Sherbrooke, Que. A plan of the old and new arrangements is given herewith, the former buildings being shown in dotted lines, while the remaining buildings of the old arrangement, and the recently, or to be, constructed buildings, are shown in full lines. The arrangement now will involve a quite complete layout, such as is seldom to be seen on such a short line.

The Quebec Central Ry. is a subsidiary unit of the C.P.R., retaining its entire organization, with complete operating staff, with headquarters at Sherbrooke, from which point the line runs northerly to Levis, opposite the City of Quebec, with two branch lines, one of which leaves the main line at Tring Jct., connecting with the C.P.R. Montreal-St. John, N.B., line at Megantic, the other leaving the main line at Valley Jct., and running northeasterly to St. Sabine, from which point the line is being extended gradually towards the New Brunswick boundary. This gives a total mileage of 253.

It is claimed that nearly 85% of the world's asbestos supply comes from the section of Quebec traversed by this line, and practically all this tonnage is handled by the Q.C.R., other lines only touching the fringe of the asbestos field. Valuable copper mines, producing a high grade of copper ore, extensive granite and lime works, and pulp and paper manufacturing industries, are also located on the Q.C.R., and in addition the northern section passes through a rich agricultural country, from which extensive shipments of cheese, butter and other farm products are made. It also opens up rich spruce forests. Consequently, most of the company's traffic is produced on its own line, and the various commodities are handled almost entirely in car load lots, most of the trains operating solid from the loading point to the transfer point, for distribution to various markets in Canada and the United States. To handle this traffic, the company has 35 locomotives, 1,067 freight cars, and 46 cars of passenger equipment of all kinds. All the repairs to this equipment are handled at the Newington shops, and the majority of the passenger and freight cars on the line have been built in these shops, a policy which has been found advantageous in keeping the shop output uniform through all the seasons.



Old and New Layouts in the Quebec Central Railway Shops.

From the fact that a large part of the freight traffic can be handled in train loads of full capacity, from time to time the company has had to add to the motive power by large capacity freight locomotives, for the maintenance of which the old shops were taxed to the limit. In consequence of this, it was decided to remodel the old shops, retaining such parts of the old layout as could be profitably utilized in the new scheme, and building a number of new ones to replace the removed ones and to extend the shop capacity. From the accompanying plan it will be seen that of the old layout the only larger buildings to be retained are the locomotive house, machine and boiler shop, and foundry. The locomotive house, formerly of 11 stalls, is rather unique from the viewpoint of modern practice, the radii to which the inner and outer walls have been struck being much smaller than usual practice dictates. The inner wall radius is 45 ft. and the outer 115 ft., giving a stall depth of 70 ft. In the centre is a 66 ft. steel turntable, which only provides a distance of 12 ft. from the edge of the turntable pit to the inner wall of the locomotive house, which, in consequence, does not provide sufficient room for locomotives between the turntable and locomotive house. The small diameter of the locomotive house makes the stall width at the outer wall very roomy, with lots of working space.

The new layout has included a 5 stall addition on the east end of the locomotive house, necessitating the removal of the old paint shop, which stood in the way of this extension. An additional depth of 5 ft. was given the new stalls, making them 75 ft. deep, so as to handle the larger new locomotives. The locomotive house is a wooden frame structure, sheathed in iron, on concrete foundations, with three rows of wooden columns, supporting a galvanized iron roof. The flooring is concrete, as are also the pits. There are driving wheel and engine and trailing drop pits, with jacks, and in the new addition there are two inspection pits. The old building was heated by stoves, but the new layout provides for steam heating of the whole building. The smoke jacks are of wood. To the rear of the locomotive house there is a locomotive shed, 125 by 40 ft., which existed in the old layout.

The boiler and machine shop, which remains as before, was the nucleus of the shop area, formerly being a packing factory, which was bought by the railway, and the main building of the plant converted

into the machine and boiler shop. It was not exactly suited for a locomotive shop, as it was very high roofed, but it has been altered so as to make it suitable to meet all requirements. The machine shop occupies the southerly end, and the boiler shop the northerly end, the two being divided by a central wall, in which there is a large brick chimney, remaining from the old packing days, which has been found useful for handling the blacksmith shop smoke, the blacksmith shop heretofore occupying the west side of the machine shop. The dimensions of the machine and boiler shop are 185 by 85 ft.

To the west of the machine shop is the old foundry building, retained in the new layout, and which is 50 by 70 ft., with a cleaning room annex, 50 by 20 ft. A coal and iron building adjoins the foundry. The new blacksmith shop is located in the L of the foundry building, and is of brick, 70 by 50 ft. This department, being removed from the west side of the machine shop, provides needed room in that shop for expansion.

The old stores building, to the east of the machine shop, which contains the Master Mechanic's office, will be removed, and another larger brick building, 165 by 45 ft., erected to the south, to house this department. The Master Mechanic's office will also be in the new building. To make way for this building, the carpenter shop, where most of the passenger equipment used on the line was built, will be removed. A new power house, 50 by 40 ft., will also be erected on the site of the old carpenter shop, to the west of the new store house. To the south of the new stores building were three lumber storage sheds, one of which has been removed. The new carpenter shop, 220 by 70 ft., will be located on a new piece of ground to the southwest of the old shop area, and will contain three shop tracks. It will be of brick, on concrete subwalls, spanned by steel roof trusses, and with a monitor roof. It will contain all the machinery now housed in the old carpenter shop.

The new paint shop, already built, is 175 by 60 ft. of brick, concrete and steel construction, and contains three tracks. It replaces the two track paint shop removed to make room for the locomotive house extension, the old oil and waste house is to be removed and replaced by a more modern structure, the details for which have not been decided on. It is expected that it will be about 40 by 30 ft., and it will contain a good oil handling system.

The shops are in charge of G. M. Robins, Master Mechanic. E. M. Green is General Foreman, Machine Shop, and R. G. Price, Car Foreman. We are indebted to J. H. Walsh, General Manager, for permission to secure the information on which this article is based, and to G. M. Robins for the detailed information obtained.

Flange lubricators on the forward driving wheels of all passenger locomotives are recommended by the German Railway Administration Society, and also on the rear wheels of locomotives having a tender as part of the locomotive. The lubricator cup is generally placed above the running board, and the lubricator so attached that the vibration or the movement of the driving springs cannot influence its position against the flange. A grease and tarry compound and crude oils are two of the lubricants used.

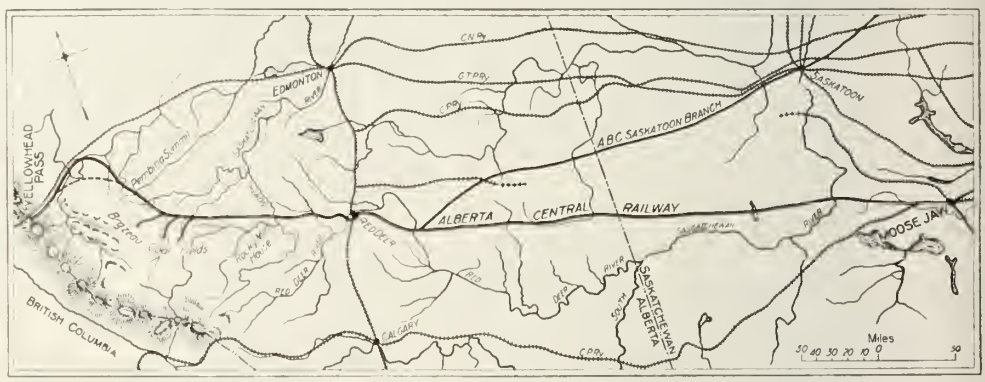
Old car trucks were put to a novel use recently on the Southern Pacific Lines, when a threatening washout of a section of the line was prevented by throwing a large number of old trucks down the embankment, thereby forming a solid retaining wall.

The Inception and Location of the Alberta Central Railway.

By J. Grant Macgregor, M. Can. Soc. C.E., formerly Chief Engineer, A.C.R.

Opportunity to open up a large tract of fertile prairie land gives access to the Brazeau coal fields and ultimately form a link in a new transcontinental railway was the germ in the idea of the Alberta Central Ry., construction on which was begun in 1910. Upon its locating engineer rested the responsibility of choosing a route that would allow at once a low first cost and later economical reduction of grades to the requirements of a trunk line. The reconnoissance surveys to find this route are believed to be of interest and will therefore be described in some detail.

The charter of the Alberta Central Ry. was granted by the Dominion Government in 1901, and, with subsequent amendments, provided for a line from Moose Jaw, Sask., to the Yellowhead Pass, on the boundary line between Alberta and British Columbia, a distance of approximately 700 miles. It stipulated as an intermediate objective point the town of Red Deer, Alberta, and provided for a branch running to Saskatoon in a northeasterly direction from a point on the main line 100 miles east of Red Deer. An act of amendment in 1911 embraced extensions from Saskatoon to Hudson Bay Moose Jaw southerly to the international boundary, and several minor branches to the Brazeau coal fields.



Map of Alberta Central Railway, as projected, and surrounding territory between Moose Jaw and Yellowhead Pass.

This map was drawn to show the situation at the inception of the A.C.R., and shows only one line west of Edmonton to Yellowhead Pass, instead of two, the Canadian Northern and Grand Trunk Pacific, as there now are. Other lines now existing in the territory covered are also not shown.

Advantages of Line.—A glance at the map will at once show the tremendous advantages to be expected of a line so located, on account of the extent and exclusiveness of the territory to be served. In this, however, the anticipations of the original promoters were doomed to disappointment, for no sooner had surveys been made and plans filed than two more companies were in the field with plans for divergent routes across the same territory. The competitive companies referred to, being stronger organizations, with greater interests at stake, followed up their surveys with their construction forces, and in a comparatively short time were in indisputable possession of their respective routes. Considering, however, that there is a zone of country from 50 to 100 miles wide tributary to those lines, much valuable territory still remains to be served by the Alberta Central Ry. The country referred to lies east of the town of Red Deer, principally between the Red Deer and South Saskatchewan Rivers. It is remarkable that although this region consists of a very large portion of the most fertile prairie land in the Provinces of Saskatchewan and Alberta, its invasion by railways is of comparatively recent origin. Many conflicting reports were in existence with regard to its character until the first survey was made for railway purposes. Experienced pioneers from the Dakotas, Montana and Washington proved the fallacy of previous reports by settling themselves comfortably on the land long before the advent of the railways—believing faithfully that their solitude would not remain long undisturbed.

The country lying to the west of Red Deer, as far as the foothills, is of a very different character, and may be described as beginning with park prairie country, bordering on the prairie country above described, and gradually increasing in diversity of contour and density of vegetation until it mingles with the virgin forests of the foothills. The soil is a rich black loam, affording abundant moisture and luxuriant grass—ideal conditions for the mixed farmer and rancher.

Reconnoissance.—As the work of reconnoissance involved the determination of the resources and possibilities of the country as a revenue producer, in addition to the usual surveys for the determination of its physical character, the foregoing introductory remarks as to its general character may not be devoid of interest. Where lines are projected in regions the resources of which are more or less unknown, it is important that the work of reconnoissance should be of the twofold character mentioned. This article is designed to deal principally with the work of reconnoissance and location.

In Aug., 1909, the writer was authorized to investigate the possibilities of a direct line from Moose Jaw to the Yellowhead Pass. The advantage of a direct line between points mentioned suggested to the original promoters another link in the transcontinental lines of the Dominion, and special emphasis was laid on the request that whatever was done in the way of reconnoissance, the ultimate object would be the location of a line with low grades, the maximum to be 0.4% in both directions. At the same time it was generally understood that for the present the Alberta Central could be no more than a colonization railway, the feature of low grades being only admissible where the cost would compare favorably with that of similar railways or branch lines built for colonization purposes.

Character of Ground.—Between Moose Jaw and Red Deer no difficulty was experienced in finding low enough summits to admit of a 0.4% ruling grade in each direction, with a reasonable amount of surface development to secure sustaining ground

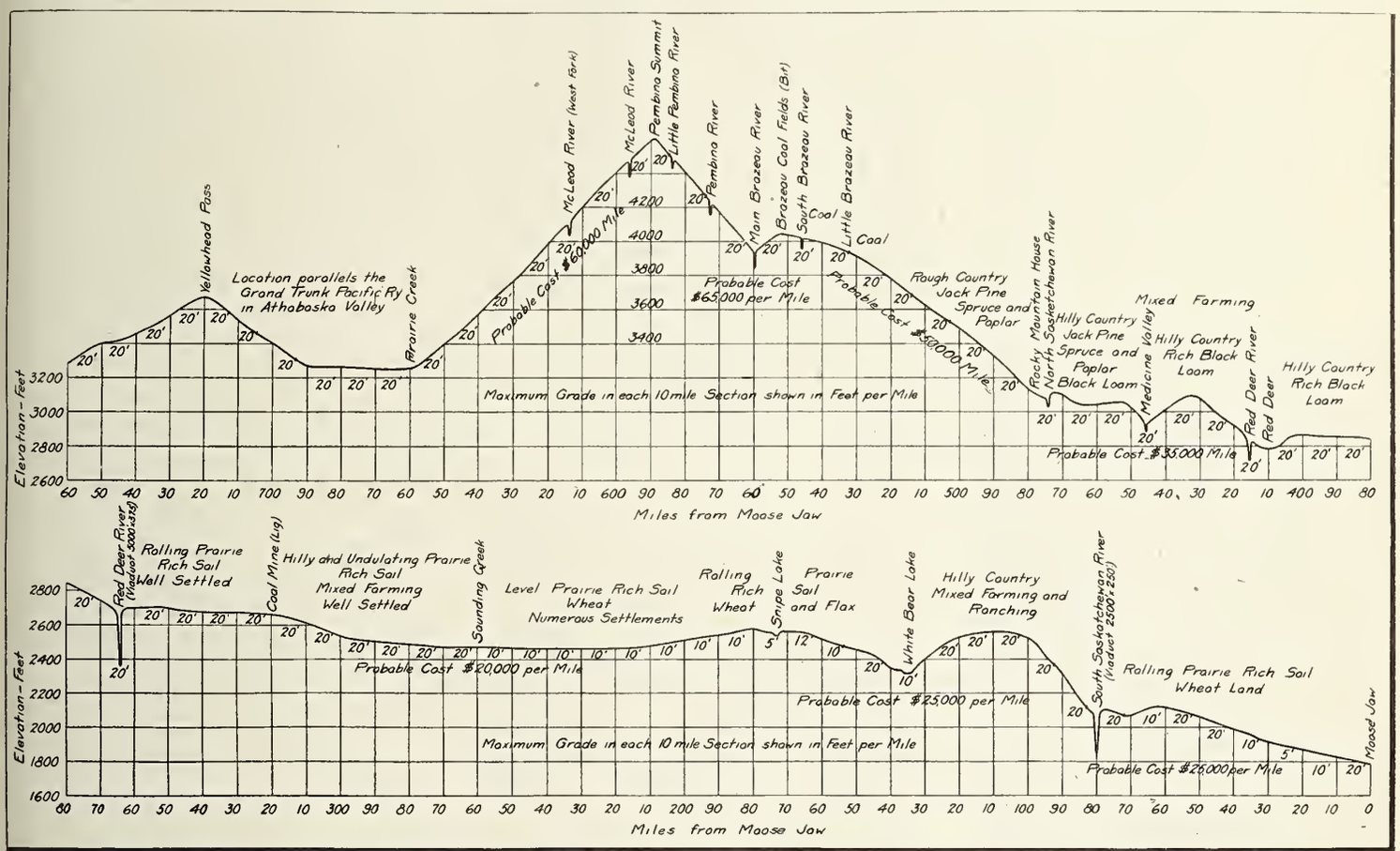
for a moderately cheap line, but from Red Deer to the mountains many long detours were necessary to attain this purpose. In the latter case it is evident that in endeavoring to obtain the shortest possible routes the topography will invariably develop long stretches of maximum grades. The question as to what extent distance should be sacrificed in order to avoid this so-called objectionable feature necessarily involves one or more of the intricate problems of railway location, and in order to provide for this during the work of reconnoissance sufficient margin was left for the locating engineer to work out the economic equations dependent thereon. The possibility of introducing velocity grades at favorable points during location was also considered. These were the governing features of the work of reconnoissance as carried out, but nevertheless the application of so extremely low a ruling grade was often found to be difficult and uneconomical.

two 3 in. field aneroids reading to 15,000 ft. After carefully considering the advantage of stationary readings and self recording aneroids for correcting the error due to atmospheric conditions the writer was induced to abandon these methods and adopt a method by which a vigilant observer can ascertain the correction for atmospheric changes to better advantage in the field. Two instruments were in use in the field, one for observing the altitudes and the other in reserve in case of emergency and for detecting errors of a physical character in the instruments in use.

One day's work will suffice to illustrate the method of recording the observations and corrections made for determining the altitude. A start is made at some point, the altitude of which, above sea level, is already known and carefully recorded by the aneroid a few hours before starting. Another observation is made by the same instrument at the same spot when starting, the

ined at the start, or wherever available during the progress of the work, was added or subtracted, as the case might be, and the result entered in the column for "Elevations above sea level." The condensed profiles which accompanied the reconnoissance reports were afterward prepared from the elevations above sea level. These profiles pieced together form the continuous profile accompanying this article and cover a distance of more than 700 miles.

The accuracy of the work was amply proved to be satisfactory for the purpose of a reconnoissance. The country from Red Deer eastward 200 miles was explored from Red Deer and checked on the return journey. The country from Moose Jaw westward 250 miles was covered by a single trip from the Moose Jaw end, making connection with the work from Red Deer eastward near Sounding Creek. On comparing the reading with sea level after a trip of 250 miles the error was found to be not more than 20 ft. Of



Reconnoissance profile, showing main characteristics and estimated unit costs for various sections, Alberta Central Railway.

The work in the field was facilitated by reference to the township maps and section corners. A straight line was drawn between objective points on the map and a zone of country 3 miles wide on each side of this line laid off to indicate the extreme limits of deviation. Next to grades in importance were to be considered the instructions relative to directness of route, but it was considered by the writer that a route which did not vary much more than 3 miles on each side of a "crow-fly" line would in a distance of 300 or 400 miles be considered fairly if not unusually direct, even on the prairies.

To those familiar with the use of the aneroid, with its contingent variations and vagaries, and the vigilance necessary to avoid errors in the field, the writer's experience may be of more than ordinary interest. The instruments used were one 4½ in. compensated surveying aneroid, reading to 8000 ft. for stationary reading, and

difference of the two readings giving any local variations. The practice was to take observations of local variations every few hours, usually at meal hours. If the weather appeared unsettled, a rest of half an hour between meal hours was often found to be time well spent on the journey. Observations were always made on retiring at night, on rising in the morning, on starting out for the day and on arriving at the next camping place in the evening.

Record of Observations.—The accompanying blank form will illustrate the system used for recording aneroid observations in the field book and afterward reducing them to sea level. By carefully studying the fluctuations of the barometer during the day the corrections for each observation were determined by interpolation and entered in the column for "Corrected barometric readings." The difference between the corrected reading and sea level, which was determ-

course this does not indicate that the error throughout the work was not at any time more than 20 ft. It would be more reasonable to suppose that in such a long distance, without a check, errors would compensate for errors, but at any rate the result is sufficient to show that accurate work can be done by the method explained. It may be added that the weather was extremely favorable for barometric observations.

The work of reconnoissance west of Red Deer was more tedious, particularly in the unsurveyed territory west of Rocky Mountain House. Several long journeys were made ahead of the preliminary survey party to define certain summits, but except for these occasional trips the reconnoissance engineer kept in touch daily with the preliminary survey party—which is, after all, the only satisfactory way of doing the work in rough country if preliminary surveys are already authorized.

Beginning of Construction.—The preliminary survey immediately followed the work of reconnoissance, and construction, which was begun in Aug., 1910, was well advanced before the preliminary survey party was withdrawn from the field. Altogether 400 miles of line were located, about equally divided east and west of Red Deer. Plans and profiles of this location have been filed and approved by the Board of Railway Commissioners, giving the Alberta Central Ry. Co. access to the Brazeau coal fields on the one hand and the fertile prairies of central Alberta on the other, with a prospect of a through line to the coast, in which event considerable traffic would be developed in both directions.

Little of interest remains to be said with regard to the location which followed the reconnoissance, except that deviations from the route mapped out for the locating engineer were slight and consisted of more or less surface development for the purpose of gaining sustaining ground or distance. In one instance only in the rolling prairie country the locating engineer made a slight deviation, expecting to find better sustaining ground, only to return to the route mapped out after many weary miles of useless work. An important part of the work of preliminary location, however, was that of the topographer, upon whose work at the close of each day the locating engineer depended for the final adjustment of the located line to the contour of the ground. The value of accurate topographical work can hardly be overestimated, although seldom fully appreciated in the work of railway location.

Record of Reconnoissance Observations and Calculations

Date	Hour	Field barometer reading	Elevation above sea level	Corrected barometric reading	Stationary barometer (if any)	Location and remarks

Another feature, and by no means the least important, is the type of profile developed and the economic value of this location in country which is obviously hostile to a 0.4% grade. On the long stretches of maximum grade referred to in a previous paragraph, heavy cuts and fills were unavoidable, and looked almost forbidding, and would only be justifiable when the volume of traffic reached an average of twelve trains per day operated as a through line. The line located will, therefore, in course of time, it is assumed, admit of grade reduction to this extent without abandoning right-of-way, bridges or townsites. The maximum grade for present requirements was fixed at 0.8%. The application of an 0.8% maximum grade to the profile of a 0.4% location will eliminate nearly all of the heavy work, and in many instances leave a mere surface line for present construction.—Engineering Record.

Editor's Notes.—The Alberta Central Ry. Co. was, as above stated, incorporated by the Dominion Parliament in 1901, the provisional directors being G. W. Smith, W. A. Moore, G. W. Greene, Red Deer, Alta.; D. J. Munn, New Westminster, B.C.; J. T. Moore, J. Flett, R. C. Clute, Toronto. It was given power to build a railway from tp. 38, range 23 west of the 4th meridian westerly to Red Deer, thence westerly to tp. 39, range 7, west of the 5th meridian. In 1903 the company was given additional time for construction and power to extend its line easterly to tp. 39, range 11, west of the 4th meridian. It obtained another extension of time for construction in 1905, and again in 1907, in which year the names of J. J. Gaetz and J. C. Moore were added as provisional directors and that of W. A. Moore struck out. Another extension of time was granted in 1909, and authority given to build additional lines as follows:—From the westerly terminus near Rocky Mountain House to the G. T. Pacific Ry. near Yellowhead Pass; from the easterly terminus near the elbow of the Battle River to Saskatoon or Warman, Sask., and from near Red Deer southerly and easterly to Moose Jaw, Sask. The company's powers were considerably extended in 1909, when it was given authority to extend its Saskatoon line to Fort Churchill, Hudson Bay, with a branch through Pas to Port Nelson, Man.; to extend its Moose Jaw line to the International Boundary in tp. 1, range 16, west of the 2nd meridian; a line from between Red Deer River and Cygnet Lake northeasterly to Blackfields and on to Lacombe, Alta.; three branch lines into the Big Horn Range, between the North Saskatchewan and Brazeau Rivers; two branch lines in ranges 20, 21 and 22, tps. 43, 44, 45 and 46 west of the 5th meridian, and another branch along the Brazeau and Pembina Rivers.

The organization of the company was completed in 1909, J. T. Moore being President and J. G. MacGregor, Chief Engineer. The first location plans for the line from Red Deer to Rocky Mountain House were approved in 1910, and a contract was entered into with the Dominion Government under the act granting aid for construction, for the building of a 70 mile line between these points. Construction was started and carried on during the season by day labor under the direction of the Chief Engineer, and there was a "display" of tracklaying in the presence of the Minister of Railways, Aug. 11, 1910. It was reported that about 20 miles of grading had been completed up to Dec. 31, 1910. A contract was let for grading early in 1911 to D. F. McArthur, Winnipeg, for the line to Rocky Mountain House, and at Dec. 31, 1911, track had been laid on seven miles.

It was reported early in 1909 that the C.P.R. was about to take over the charter and complete construction of the line, but this was denied. It was, however, understood that the C.P.R. would ultimately become possessed of the line, and in Jan., 1912, an official announcement was made that the transfer had taken place, and at the C.P.R. annual meeting, in Oct., 1912, a resolution was passed approving of the lease of the A. C. Ry. for 999 years at a rental equal to 4% interest on the bonds issued for construction. The company continues its separate existence, but it is officered and controlled by C.P.R. men.

After the lease to the C.P.R., the construction programme was rearranged, a new contract was entered into with the Dominion Government for aid, and at the end of 1913 about 20 miles had been completed, which it is expected to open for traffic this summer.

Soon after the company began locating its lines the Canadian Northern Ry., either directly or by one of its subsidiary companies, filed plans for a line from near Stettler to Rocky Mountain House, and started construction. This led to a lengthy fight, which has been terminated by the conclusion of an agreement, ratification of which has been secured from the Dominion Parliament.

An arrangement has been made, and approved by the Dominion Parliament, under which the Canadian Northern Western Ry. will use a certain portion of the line, and the A. C. Ry. will use jointly with the C. N. W. Ry. an extension which it proposes to build. The details of the agreement were given on pg. 175 of our April issue.

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

THE MANUAL OF STATISTICS; Stock Exchange Handbook for 1914. 1,100 pages, 8 by 5½ in., cloth. The Manual of Statistics Co., 20 Veysey St., New York. $5.

This is the 36th annual issue of this standard publication, which adequately presents the organization, finances and position of all the leading railway and industrial companies of North America, as well as those in which U.S. and Canadian investors are interested in Mexico, South America, and the West Indian Archipelago. Since the issue of 1913 was compiled there have been numerous issues of new stocks, and changes in the organization of many of the companies noted, all of which changes are incorporated in the present edition. The tabulated statements give a great variety of information, and the stock exchange reports, add other features which render the manual an important volume of reference for the investor and the public man.

TESTS OF BOND BETWEEN CONCRETE AND STEEL. By D. A. Abrams. 238 pages; 6 by 9 ins.; illustrated; paper. Published by the University of Illinois, Urbana, Ill. Free.

This bulletin, no. 71, of the University of Illinois Engineering Experiment Station, covers an exhaustive series of tests on the strength of bonds between concrete and steel, and gives the results obtained by pulling out bars embedded in blocks of concrete, and also the results of tests made to study the bond stresses developed in large reinforced concrete beams. Nearly 2,000 tests are reported, and a wide range of conditions are represented.

TRACTIVE RESISTANCE OF A 28-TON ELECTRIC CAR. By H. H. Dunn. 63 pages; 6 by 9 ins.; illustrated; paper. Published by the University of Illinois, Urbana, Ill. Free.

This bulletin, no. 74, of the series being issued by the University of Illinois Engineering Experiment Station, records the results of tests made to determine the tractive resistance of a 28-ton electric car when running on a straight track in still air. The tests were planned to eliminate wind resistance. The results are fully expressed in the form of a curve, the coordinates of which are car resistance and speed, showing that the resistance varied between 5.25 and 26.12 lbs. per ton at 5 and 45 m.p.h., respectively. In addition to these curves, and tabulated results, the bulletin describes the car tested and methods of conducting the tests.

Air ingress openings in locomotive ash pans should be of sufficient area to ensure the presence of atmospheric pressure under the fire when the grate is working at its maximum fuel rate.

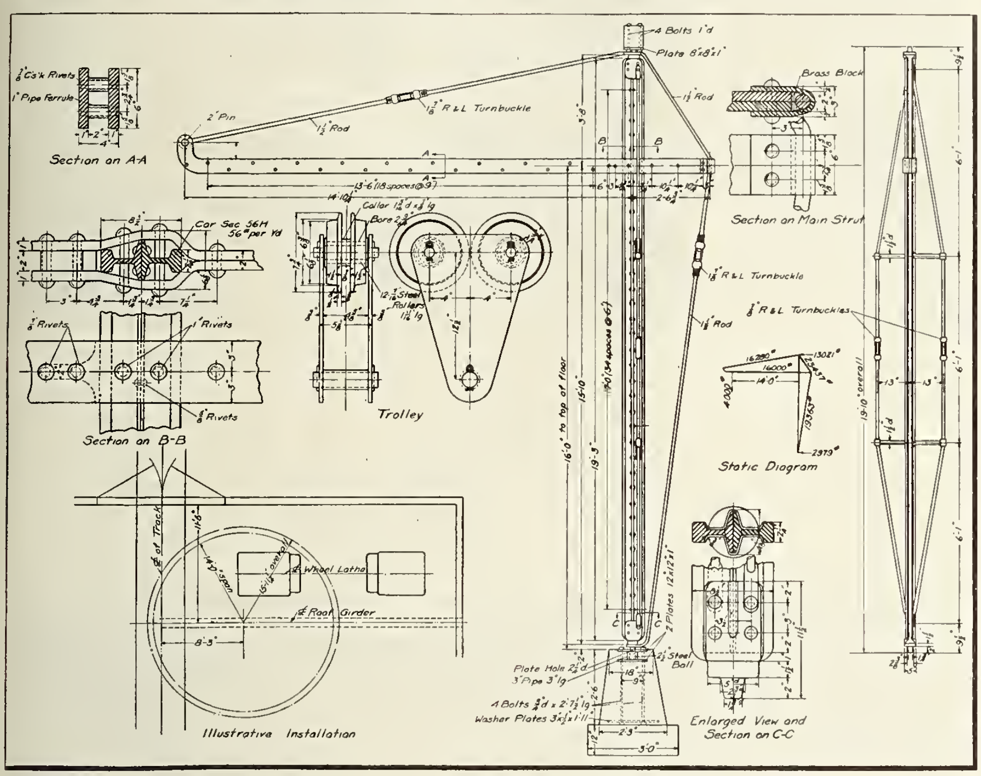
An arbitrary factor of safety for locomotive boiler construction is said to be in contemplation by the Interstate Commerce Commission.

Railway Mechanical Methods and Devices.

3,000 lb. Jib Crane for Canadian Northern Railway Shops.

In pursuance of the C.N.R.'s policy in developing, under the most advantageous conditions, equipment for its shops, a new type of light jib crane has been designed that is claimed to be superior to anything it has used heretofore, not only from the standpoint of lightness, but also from the all important standpoint of expense, all the members used in the construction being, lengths of 2 in. pipe, and fastened together by 20 ⅞ in. countersunk head rivets and 6 ⅞ in. button head rivets, the latter at the strut end, the others being countersunk to clear the trolley.

Connection at the vertical column is made through two 1 in. rivets, the arm plates being made to suit. The rear end of the arm forms a 20 in. strut for the 1½ in. truss rod that braced the vertical column in the plane of the jib arm. This truss rod has a 1⅞ in. right and left hand turnbuckle, and the ends are forged to fit over the pivot statical diagram. These stresses will not be reached normally, as the rated capacity of the crane is only 3,000 lbs.



3,000 lb. Jib Crane for Canadian Northern Ry. Shops.

for the most part, simple rolled sections that are to be found in most shops. Hence its peculiar advantage of being easily made at any point where required, and not at the main shop and to be shipped to the shop in which it is to be installed.

The construction is simple and yet efficient, in that the moving parts are so arranged that as little friction as possible must be overcome in the operation. The crane proper is pivotted on a finished steel ball, 2½ ins. diameter, set in a 3 in. length of 3 in. gas pipe, resting between two 1 in. plates, 12 ins. square, these being bolted to and imbedded in a concrete pier, 3½ ft. deep, 18 ins. square at the top and 3 ft. square on the base, the top being flush with the floor level.

The vertical member is composed of two 56 lb. rails, rivetted together base to base by 70 ⅝ in. rivets. The top and bottom connections are malleable iron sleeves into which the rail sections fit. The outer faces of these castings have a cast tip, which forms the pivot. This vertical member is secured against lateral buckling by two ⅞ in. truss rods, the central lengths of which are 13 ins. each side of the member, on 1½ in. struts. These truss rods are each provided with a right and left hand turnbuckle, and rivetted to the sleeve castings top and bottom by four ⅞ rivets.

The main arm and strut form a continuous member, built up from two 6 by 1 in. bars on edge, spaced 2 ins. apart by 2 in. castings, top and bottom of the column. The strut portion of the main arm has no pipe separators as in the jib end, and for a bearing for the truss rod there is a brass block on the end, the whole end finished off with a ½ in. cover plate, 6 ins. deep, secured by two rivets. The brass block is inserted on assembly, the tightening up of the truss rod holding it in place.

The outer end of the jib arm turns upward at an angle of 90 degrees to give clearance to the trolley, and is bored to receive a 2 in. pin. Connection between the latter and the top column casting is made through a 1½ in. rod, with a 1⅞ in right and left hand turnbuckle.

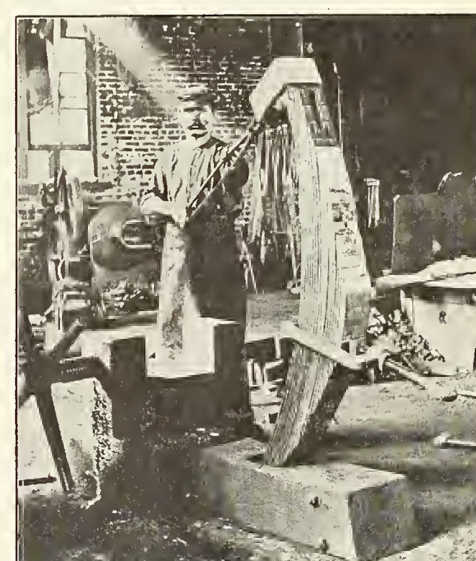
The trolley consists of two ⅜ in. plates, held between which, on two axles at 8 in. centres, are four 6⅜ in. cast iron rollers, placed back to back in pairs, running on roller bearings, the pins being 1¼ in. diameter, each having 6 7-16 in. steel rollers. The tackle supporting pin is 12½ ins. below the roller centres, and is 1½ in. diameter, with a 1½ in. pipe spacer.

The installation shown in the accompanying illustration is representative of how the crane should be installed for a wheel lathe. If it is to be used for other purposes, corresponding allowances should be made. If an air hoist is to be used, it should not exceed a diameter of 8 ins., with a stroke of from 4 to 5 ft. The stresses in the different members, and at the two points of support, for a load of 2 tons, are shown in the

Spring Making in Michigan Central Railroad Shops, St. Thomas.

The practice of making locomotive driving wheel springs appears to vary to a marked degree in practically every shop, not so much in the final finish of the product, as in the manner in which the several steps in the process are carried out. In the M.C.R. St. Thomas shops, the several leaves are made in the more or less conventional manner, first of all cutting the leaves to length, centering, and slotting the end holes, leading up to the curving and tempering stages. The first leaf is curved by hand to a form laid down on the blacksmith's surface plate, and when at the desired heat, immersed in oil, and then placed back in the furnace to draw to the desired temper. The subsequent leaves are made in much the same manner, except that, having the first one formed to the desired shape, the following one is first roughly bent by hand on the plate and then passed through a hand roller to conform to the curvature of the first, each separate leaf being so formed from the one preceding.

On completion of the series of leaves, they are placed in a pile under an air operated clamp, the centres in each of the



Powerful Screw Operated Clamp for Tightening up Spring Bands.

leaves centering the pile correctly. When correctly located with regard to each other, the pile is clamped together under the press, and the screw clamp shown on the assembled spring in the illustration tightened up on it. It is then to the position shown in the illustration. This arrangement consists of a short beam section with a recess in the top into which the spring can be stood on end. In this position the heated band is slipped over the spring and hammered down to a centrally marked position on the assembled spring. On this being done, the spring is tipped over on its side into the stationary screw clamp shown, the band resting in the clamp jaws. This clamp consists of a heavy iron casting, in one side of which there is a powerful square threaded screw which tightens up on the spring, compressing it

to the limit. This tightening springs out the band, which is then forced down flat by the sledge. The spring is left under the clamp screw pressure until it has cooled, when it can be removed, ready for service.

Machining Radius Links, Montreal Locomotive Works.

A useful jig for machining the radius links for both Stephenson and Waslchaert valve gears is in use in the Montreal Locomotive Works, and is illustrated herewith. To the table of the planer there is secured a base casting, in the upper face of which there is a pinned block, engaging in a cross slot in a superimposed clamping casting, in which the link to be machined is secured by set screws and clamp bolts in a T slot, all as shown. An arm on one side of this casting has screwed into it, at right angles to tbe jaw faces, a long rod, to which can be clamped, in any desired position, a swivel block.

Jig for Machining Radius Links in the Planer.

On a bed plate, at right angles to the bed of the lathe, and slightly above the floor level, there are two T slots, with the upper surface of casting machined. A braced casting may be moved along this surface, and may be clamped in any desired position by bolts in the T slot. The swivel block before referred to fits into the head of this casting. The link clamping member swings about this swivel block as a centre as the planer table moves back and forth. The swivel block and supporting casting can be located as desired, to give any radius within the limits of the machine. It has been found to be a very useful mechanism.

Testing 120 Ton Crane, National Transcontinental Railway Shops.

The method employed for testing the 120 ton overhead travelling crane in the N.T.R. locomotive shop at Transcona, Man., is shown in the accompanying illustration. The crane specifications called for a test load of 25% in excess of normal rating, and to subject the crane to this loading the following measures were taken: Across one of the locomotive pits there were placed cross timbers, and lengthwise of the pit, on top of these timbers, were placed two heavy I beams. Across the top of the I beams there were placed short sections of rail, and over these, in line with the I beams below, there were placed rails in a pile to make up the desired load, the number of rails required to make up this load having been previously computed. Under one end of the two supporting I beams was placed the locomotive rear end jacking link, attached to one of the crane lifts, and under the other end, cables, attached to the other crane hoist. In this position the two hoists lifted the load of 150 tons and then carried it the length of the shop and back. The cranes proved easily capable of carrying the specified overload.

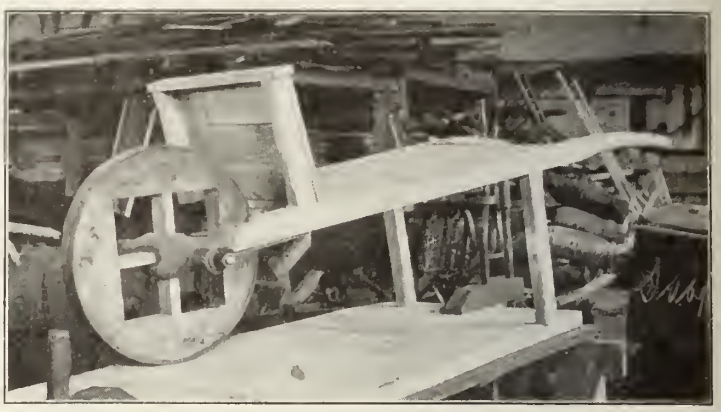
The Board of Railway Commissioners and Standard Railway Fences.

Chief Commissioner Drayton has given the following decision:—The engineering department has drawn to the Board's attention the fact that the different railway companies use different fences. For example, the Grand Trunk Pacific uses a 5 wire fence with a board on top; the Grand Trunk uses a 10 wire fence, the Canadian Pacific uses a 5 wire fence to stop cattle and horses only, and a 7 wire fence on smooth or level ground with the bottom wire 6 ins. from the ground; while the Canadian Northern uses 7 wire fence.

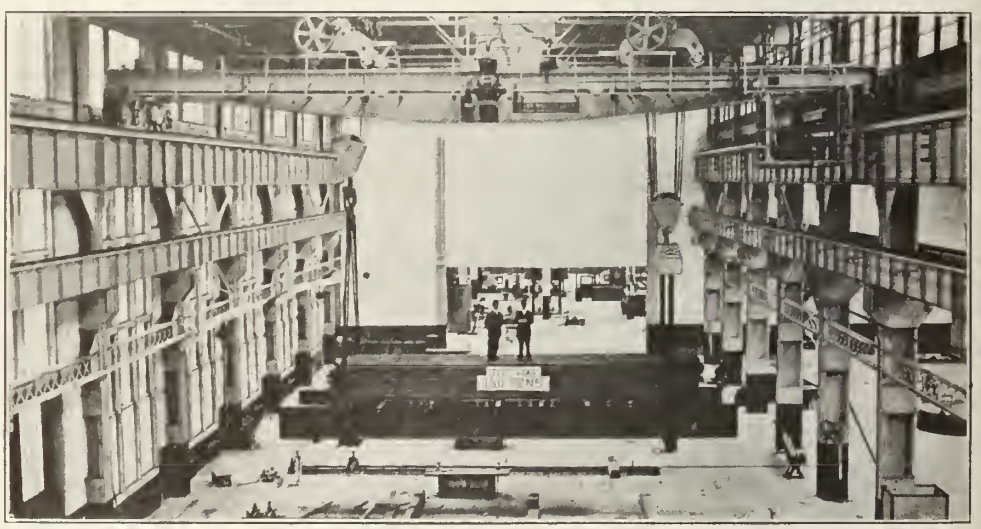
The question of the adoption of a standard fence was brought to the attention of the railway companies during the Board's western trip recently. No representations have, however, been filed by the railway companies. I am of the opinion that it is inadvisable for the Board to prescribe any standard fence. The statutory obligation of the company to my mind forms a sufficient protection to the public. The obligation thrown on the railway companies is to provide such fence as will be sufficient to prevent cattle and other animals from getting on the railway. This includes (with the exception, of course, of poultry), all the farmers' stock. If the Board were to order the adoption of any particular standard, it might well be that, in some instances, its standards would not be sufficient, and in others would be unduly onerous. Leaving the matter as the statute leaves it, the responsibility of the railway company in each case is clear—the fences must be sufficient to stop live stock from getting on the railway track.

Simple Design of Wheelbarrow in Central Vermont Railway Shops.

For shop use there has been developed in the Central Vermont Ry. shops at St. Albans, Vt., a simple design of wheelbarrow, which is illustrated herewith. The frame consists of two horizontal hardwood members, into which have been tenoned four cross bearing members, supporting tbe decking, which is nailed thereto. Near the rear of the decking are tenoned two vertical supporting legs. The upright from the decking consists of two vertical short arms, tenoned into the side members, with sheeting secured to the inner side. Two straps bolted to the forward end of tbe side members are forged to form side bearings for the wheel, which consists of a central hub, reinforced at the ends with retaining bands, with shaft pins extending about 1½ in. at each end. Tenoned into this hub are four rectangular spokes, which at the outer end are tenoned into four plain blocks of wood, the outer periphery of which are turned to receive a retaining band of iron. This completes the wheelbarrow, and while it is not a very graceful construction, it has proved very useful for general service, and, in addition, has the advantage of being cheap in construction, as well as strong enough to stand severe usage.



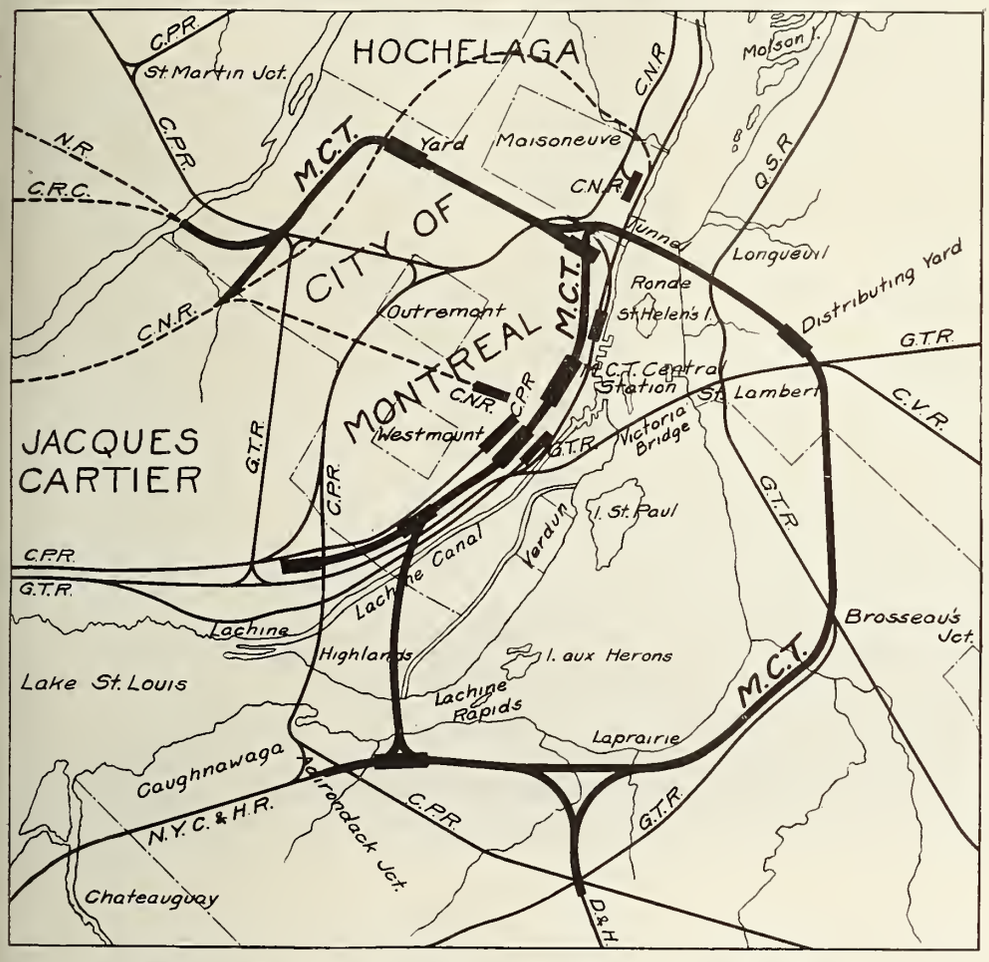
Simple Design of Wheelbarrow for Shop Use.



Testing 120 Ton Travelling Crane with Rail Loading to 25% Overload.

The Montreal Central Terminal Company's Project.

Canadian Railway and Marine World published in a recent issue general particulars of a prospectus issued in England, offering for sale £1,028,800 ($5,000,000) 1st mortgage 5% bonds of this company, due June 1, 1964, the issue price being 90. The prospectus states that the bonds are to be secured by a mortgage on the company's central station, proposed to be built in Ontario St., Montreal, with yards, warehouses, etc., in connection therewith, and railway lines to be built between the central station and the point of junction, near Bordeaux, with railways entering Montreal from the north and west. It is further stated that the proposed system of the company's railways will be connected, when completed, with at least 12 railway lines and will exchange traffic therewith. Following are additional extracts from the prospectus:—



Projected Line of the Montreal Central Terminal Co. Around Montreal.

"The company has been formed for the purpose of providing facilities for the entrance into Montreal of the traffic of a number of railway lines and systems which are at present debarred or restricted from free communication with the city. Montreal is . . . situated on an island, and there is only one bridge across the River St. Lawrence, opposite the city, and it is controlled by one railway company. This bridge, together with its approaches, is nearly two miles in length. Another railway company has a bridge across the river seven miles west of its city station. Other means of access to the city from the south are urgently required. Besides these vital requirements there is no efficient means for the exchange of traffic between the different railways at Montreal, and for the collection and distribution of goods traffic in the city. It is therefore proposed to construct the necessary railway lines, bridges and tunnels, freight and passenger stations, in accordance with the powers granted to the company by the Dominion Parliament. To complete the scheme will require the construction of nearly 50 miles of railway, a large central passenger station, and a number of goods depots, transfer yards, etc. The company intends to carry out the work in sections, each section being self-supporting. The first section to be completed will provide facilities for the railways coming into the city from the north and west. It is intended to proceed at the same time with the tunnel under the St. Lawrence and the connections with the railways from the south and east, which should be completed soon after the first section.

"The company has also been granted powers by Parliament to construct freight and passenger stations, elevators, warehouses and general freight and passenger terminals in and about the city, and such branch lines and sidings as may be necessary to connect them with the company's lines. The company may also, subject to the approval of the plans by the Governor in Council, construct a bridge across the St. Lawrence opposite Montreal, or construct a tunnel or tunnels in lieu of such bridge. The company has also been granted powers to construct lines on both sides of the St. Lawrence in order to form connections with any railways coming to Montreal from every direction, and it may also construct its lines, bridges and tunnels so that it may convey and distribute power, heat, light, gas, air and water by conduits, wires, tubes, pipes, or otherwise. The company has been authorized by Parliament to enter into agreements with any railway lines desirous of entering Montreal for the use of its tunnels, bridges and other terminal facilities and for exchange of traffic. The company's acts provide that all companies are entitled to equal facilities on equal terms. The amount of business offering fully justifies a very large expenditure on terminal facilities, and should assure much more than the income necessary to pay fixed charges.

"The proceeds of this bond issue, after payment of the expenses of the issue and outstanding liabilities of the company, up to £20,000, are to be used in the purchase of the necessary properties required in connection with the undertaking and the construction of passenger and freight stations, warehouses, and other buildings, and of the different lines of railway to connect same with railways coming into Montreal, and upon interest during construction. The properties and works mortgaged are all in Montreal, and the greater part (over 7,000,000 ft.) of the land required has been secured, so that the work may be proceeded with at once. The company should obtain a large revenue from the lease of a portion of this property not required for its own purposes. The great advantage to the lessees of this property of the railway facilities which they will enjoy should create an active demand for these sites. It is expected that the terminal station yards, etc., will be sufficiently advanced by July, 1915, to permit of their use for passenger and goods traffic, and that the work will be fully completed by Dec., 1915. The estimated earnings from this section of the company's enterprise, until the tunnel and connections with the railways on the south shore of the river have been completed, are $1,494,835

"Working expenses, 60%	896,900
"Net earnings	$597,935
"Required for interest on bonds	250,000
"Surplus	$347,935

"The amount required for sinking fund after June 1, 1919, will be $50,000 a year. After the completion of the tunnel these earnings should be largely increased. The above estimate is from railway traffic alone, and does not include any revenue from leases of land or from other sources. The yearly increase in railway traffic at Montreal is so great that it is safe to expect that it will double within the next five years, by which time two new transcontinental lines will be in active operation."

The directors are C. Newholme Armstrong, Vice President, Central Ry. of Canada, London, Eng., President; J. E. Wilder, manufacturer, Montreal, Vice President; Hon. T. Berthiaume, proprietor, La Presse, Montreal; Sir Thos. H. C. Troubridge, London, Eng.; A. E. Labelle, Harbor Commissioner, Montreal; F. H. Allen, New York; and F. E. Came, M. Can. Soc. C. E., Montreal. Sir Douglas Fox and Partners, Montreal, are consulting engineers.

Maple draught timbers are reported to be in use in large numbers on Canadian railway equipment, this information being elicited in the discussion following the submission of the report on the uniform grading and inspection of lumber at the Railway Storekeepers' Association annual meeting. It is said that they are giving as good or better service than the average oak received from the south.

By having the conductor's valve graduated, it would be possible to make a service stop where an emergency stop was not necessary. The conductor's valve is especially valuable in backing into sidings, particularly in foggy weather.

Articulated Locomotive With Tender Motive Unit.

A radical departure in locomotive design has been produced in the new articulated 2-8-8-8-2 locomotive completed recently for the Erie Rd. It is called the triplex compound, or centripede type, and, as the name implies, goes beyond the Mallet articulated type by the addition of a third motive unit, made possible by placing another pair of cylinders and another group of driving wheels under the tender, the latter being articulated with the front two sections. It is said to be the largest and most powerful locomotive ever constructed, having a theoretical tractive effort of 160,000 lbs., exceeding the tractive effort of 115,000 lbs. of the Virginian Mallet, which, up to the production of this new type, held the record.

The six cylinders are all the same size, 36 by 32 ins., and as large as the clearance limits will permit. The pair on the central unit are the high pressure, the pairs on the front and rear units being the low pressure, the locomotives working compound, as this was considerably more feasible than working triple expansion, on account of the excessive size of the low pressure cylinders for such a locomotive. The right high pressure cylinder exhausts into a receiver, which supplies the front pair of low pressure cylinders, and the left hand high pressure cylinder exhausts to the rear pair of low pressure cylinders, in a similar manner, giving a cylinder volume ratio of 2 to 1, the usual ratio existing for compounding locomotives.

The boiler is of unusual size, at the front end being 94 ins. diam., and at the dome ring, 108⅛ ins. diameter, the barrel having a taper course. The firebox is made quite shallow to sit over the rear three of the central pairs of 63 in. drivers. The boiler centre line is 10 ft. 7 ins. above the rail, requiring a very short dome for clearance considerations, 13 ins. high and 33 ins. diam. For similar reasons, the sand box, instead of being one dome, forms two comparatively small ones, 2 ft. either side of the centre line. The firebox is radial stayed, and is 162 ins. long by 108 ins. wide at the mud-ring. The grates extend forward 120 ins. to a Gaines brick wall, forming a combustion chamber at the forward end. The Schmidt superheater is the largest ever applied to a locomotive, and has 53 elements, with 1,584 sq. ft. of superheating surface.

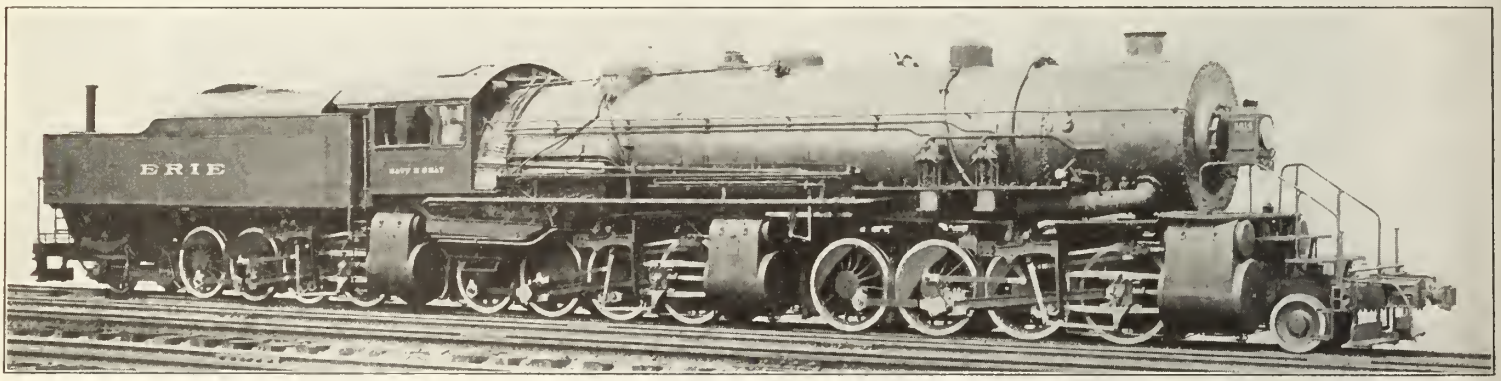
Steam passes to the high pressure cylinders through outside pipes, with a ball and sliding joint. Front and rear receiver pipes, with ball and sliding joints, transmit the steam to the low pressure cylinders. The front cylinders exhaust to the stack, while the exhaust from the rear ones passes through a feed water heater, and then out by a short, vertical pipe at the rear end of the tender. All the valves are 16 ins. diam., and are controlled simultaneously by a power reverse gear.

The frames are vanadium cast steel, 6 ins. thick. The front spring equalization is continuous, as is also the middle unit, only without cross connection, while on the rear unit, the first and second drivers are equalized together, each side independently, while the third and fourth drivers are equalized with the trailing truck.

A feed water heater supplies water at 200 degs. Fahr., being forced into the boiler by two single acting pumps, one on each side of the locomotive, and driven from the cross-heads through simple levers. In addition, the locomotive is equipped with two injectors. Following are a few of the principal dimensions:—

Tractive effort, compound	160,000 lbs.
Weight on leading truck	32,050 lbs.
Weight on first group of drivers	250,000 lbs.
Weight on second group of drivers	254,300 lbs.
Weight on third group of drivers	257,300 lbs.
Weight on trailing truck	59,400 lbs.
Total weight on drivers	761,600 lbs.
Total weight of locomotive and tender in working order	853,050 lbs.
Wheel base, each group	16½ ft.
Wheel base, total driving	71½ ft.
Wheel base, total locomotive and tender	90 ft.
Cylinders	36 by 32 ins.
Valves, diam. and type	16 in. Piston
Valve gear	Baker
Driving wheels, diam.	63 ins.
Leading truck wheels, diam.	33½ ins.
Trailing truck wheels, diam.	42 ins.
Working pressure	210 lbs.
Tubes and flues, length	24 ft.
Tubes, No. and o.d.	326—2¼ ins.
Flues, No. and o.d.	53—5½ ins.
Heating surface, tubes	6,418 sq. ft.
Heating surface, arch tubes	88 sq. ft.
Heating surface, firebox and combustion chamber	380 sq. ft.
Heating surface, total	6,886 sq. ft.
Heating surface, superheater	1,584 sq. ft.
Heating surface, total equivalent	9,262 sq. ft.
Grate area	90 sq. ft.
Tender water capacity	10,000 U.S. gals.
Tender coal capacity	16 tons

The locomotive was built by the Baldwin Locomotive Works, the designs being evolved by that company in conjunction with the railway company.

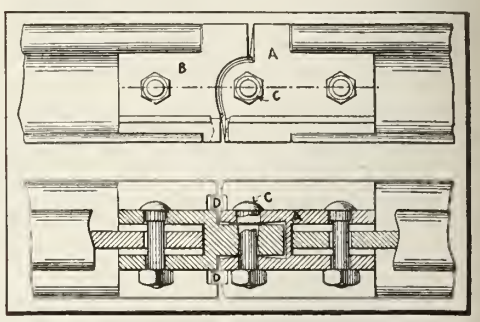


Articulated Locomotive, With Tender Motive Unit, on the Erie Rd.

Flexible Rail Joint for Steam Shovel Tracks.

The track on which steam shovels operate needs considerable flexibility to adapt itself to the irregular surface upon which it is laid. The track is in short sections, usually spliced in the usual way, but the splices do not allow for longitudinal bending in a horizontal plane. If the splice joints are bolted tight they do not allow for lateral movement, and there is likely to be breakage or distortion, but if the bolts are left loose enough to allow lateral play, the track may be insecure and lead to derailment, especially as the joint may be covered with mud or water.

A special rail joint for this particular service has been used for several months on the Panama Canal, and after satisfactory results with the first lot, a sufficient number was ordered to equip ten steam shovels, each shovel track (in 6 ft. lengths) having 22 joints. The device is shown in the accompanying illustration, and it will be seen that it consists of two steel castings, bolted to and projecting beyond the rail ends. One casting A is of H section, the end of the web of the rail entering one of the recesses,



Flexible Rail Joint for Steam Shovel Tracks.

while the other receives the end of the casting B, bolted to the other rail.

Each casting is secured to its rail by a single bolt, while a third bolt C, through the engaging portions of the castings, forms a pivot allowing for longitudinal flexibility. The outer or projecting ends of the H casting are curved laterally, as shown, thus allowing for lateral flexibility. In case this lateral movement should be undesirable at any time, however, it may be prevented by driving spikes in the slots D, provided for the purpose.

This joint is the invention of P. J. Thull, of Culebra, Panama Canal Zone, who was a steam shovel operator on the canal.

Locomotive headlights of the following kinds and numbers were reported recently as in use on locomotives on U.S. lines:—Electric arc, 22,120; electric incandescent, 632; acetylene, 2,904; and oil, 42,213. This was ascertained in connection with proposed legislation requiring greater candle-powers in headlights. The railways object to this legislation on the ground that with more powerful headlights the concentration of such powerful rays often has the effect of confusing the engineman, or causing him to misinterpret signals, rather than to prove of real assistance to him.

Steel and steel underframe cars to the number of 12,798 were reported in service in the U.S. on Jan. 1. Of these, 8,863 were steel and 3,935 steel underframe. On the same date there were in service 44,560 wooden cars, which shows a retirement of 3,566 such cars in the previous two years. The charge to operating expenses under the classification of accounts of the Interstate Commerce Commission, assuming a value of $4,000 per car replaced, will be $178,240,000.

Cross Ties Purchased by Railways in 1913.

This bulletin is based on reports received from 47 steam railways and 32 electric railways purchasing ties in 1913. The total number of ties purchased was 19,881,714, valued at $8,470,849, and of this total 3,254,587 ties valued at $1,827,358 were reported as having been purchased in the U.S. This brings out the fact that Canadian railways imported 16.4% of their ties and paid on an average 13c. a tie more for this than the native article.

Table 1 gives the details of the ties purchased in Canada in 1912 and 1913 by kinds of wood. The decrease in the number of ties purchased in 1913 was 6.7% of the total for 1912. Out of 20 kinds of wood reported the two most important, jackpine and white cedar, were reported in smaller quantities than in 1912, as were seven of the other kinds of wood. The use of Douglas fir increased and formed 12.2% of the total, compared with 10.2% in 1912. The use of this wood has steadily increased since 1908. Four other British Columbia species, Western larch, spruce, hemlock and red cedar, all showed increases from 1912 to 1913. The eastern species of these woods all showed decreases during the same year. Oak ties, of which the greater part are imported, were purchased in increased numbers, but all the other hardwoods, with the exception of elm, showed decreases.

The average price of ties of all classes was practically the same in 1913 as in the preceding year. The two most important woods were purchased at a slightly lower price than in 1912, and of the others five showed increases and eight decreases.

Table 2 shows the details of the ties purchased by the 47 steam railways in 1912 and 1913 by kinds of wood. A total of 19,490,491 ties, or 98.0% of all those purchased in Canada, were used by steam railways. This total is a decrease of 6.4% from the total for 1912. The ties imported for use by this class of companies amounted to 3,235,022, valued at $1,813,256, and formed 16.6% of the total.

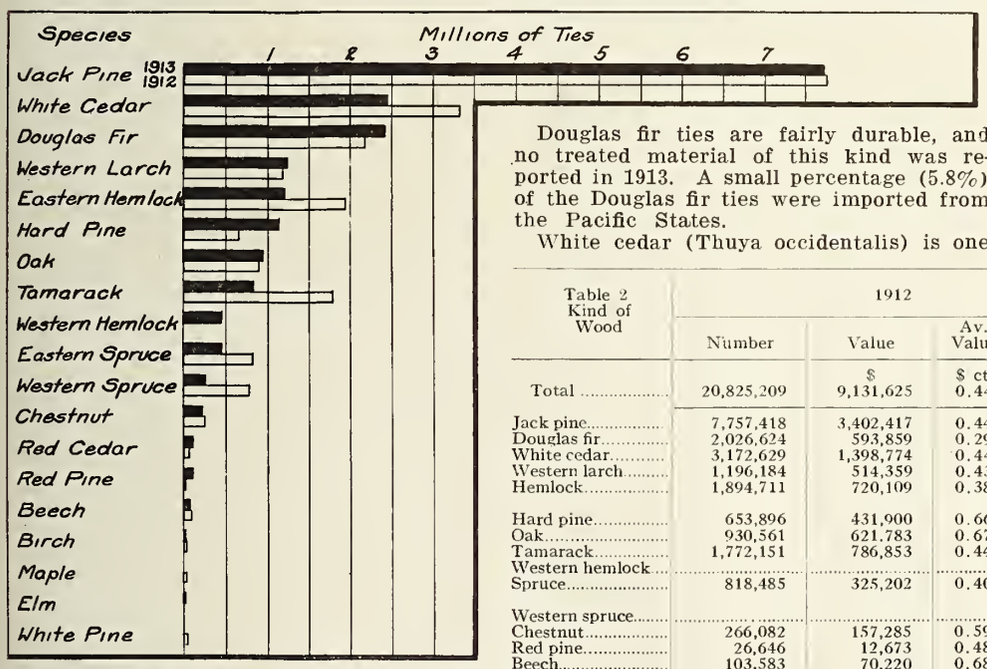
The jackpine ties included in this table were made up of two separate species, eastern jackpine (Pinus Banksiana), which is cut in every province east of British Columbia, and lodgepole pine, which is cut only in British Columbia and western Alberta. Although this is one of the most widely distributed and abundant trees in Canada, the steam railways reported the purchase of 161,023 imported jackpine ties from the U.S. This wood is used for ties chiefly because of its cheapness and abundance, and the fact that it is fairly strong.

Table 1

Kind of Wood.	1912 Number	1912 Value	1912 Av. Value	1912 Per Cent.	1913 Number	1913 Value	1913 Av. Value	1913 Per Cent.
		$	$ cts.			$	$ cts.	
Total	21,308,571	9,373,869	0.44	100.0	19,881,714	8,740,849	0.43	100.0
Jackpine	7,783,034	3,417,238	0.44	36.5	7,773,674	3,103,140	0.40	39.1
White Cedar	3,332,105	1,486,456	0.45	15.6	2,451,527	1,090,436	0.44	12.3
Douglas fir	2,183,554	661,891	0.30	10.2	2,427,100	801,710	0.33	12.2
Western larch	1,196,184	514,359	0.43	5.6	1,225,956	636,631	0.52	6.2
Hemlock	1,947,474	743,535	0.38	9.1	1,199,699	455,662	0.38	6.0
Hard pine	658,096	434,840	0.66	3.1	1,138,351	621,032	0.55	5.7
Oak	933,486	624,174	0.67	4.4	978,554	673,244	0.69	4.9
Tamarack	1,803,696	806,049	0.45	8.5	866,231	369,666	0.43	4.4
Western hemlock					479,113	148,725	0.31	2.4
Spruce	835,121	330,854	0.40	3.9	458,256	151,049	0.33	2.3
Western spruce	8,000	4,640	0.58		267,917	70,685		1.3
Chestnut	266,082	157,225	0.59	1.2	232,179	126,795	0.55	1.2
Red cedar	82,357	29,109	0.35	0.4	115,578	77,328	0.67	0.6
Red pine	26,646	12,673	0.48	0.1	114,852	52,112	0.45	0.6
Beech	103,583	70,220	0.68	0.5	96,923	60,552	0.62	0.5
Birch	37,943	22,605	0.60	0.2	24,736	10,447	0.42	0.1
Maple	51,465	39,681	0.77	0.2	16,860	14,381	0.85	0.1
Elm	2,868	1,361	0.47	x	13,674	6,421	0.47	0.1
Ash					503	216	0.43	x
Cherry					31	17	0.55	x
White pine	44,408	15,348	0.35	.02				
Balsam fir	12,469	1,621	0.13	.01				

xLess than one-tenth of one per cent.

Untreated jackpine ties decay very rapidly in the roadbed, and the practice of treating them to prevent decay is becoming more prevalent each year. In 1913, 709,227 jackpine ties received preservative treatment before being laid in the steam roadbeds.



Douglas fir ties are fairly durable, and no treated material of this kind was reported in 1913. A small percentage (5.8%) of the Douglas fir ties were imported from the Pacific States.

White cedar (Thuya occidentalis) is one of the most durable woods in Canada and has always been a favorite tie material, although its softness makes frequent renewals necessary where traffic is heavy. Most of the cedar ties used wear out before they decay, and therefore preservative treatment is not necessary under prevalent conditions. White cedar ties are obtained in Ontario, Quebec and New Brunswick, and 6.6% of those purchased came from the Lake States.

Western larch or tamarack (Larix occidentalis) is a hard strong wood, but one which is not so durable that preservative treatment does not effect a saving in its use. The wood is cut in British Columbia, and 4.7% of the ties used in Canada in 1913 were imported from Washington and Oregon. Altogether only 3.4% of the larch ties were treated.

Eastern hemlock (Tsuga Canadiensis) is cut only in the provinces east of Manitoba and is not considered a first class tie material. All the ties of this wood were purchased in Canada and none were given any preservative treatment.

Oak ties were the most expensive on the list, among the more important woods, and were used for switch ties and on lines where the traffic is exceptionally heavy. By far the greatest part of the oak ties were imported, 96.8% coming from the U.S., and were made up of a large number of commercial species. The fact that it pays to apply preservative treatment to a hard, strong and even durable wood like oak is demonstrated by the fact that the steam railways in 1913 purchased 525,623 treated oak ties, this number forming 54.3% of the total.

Hard pine from the southern Atlantic and

Table 2

Kind of Wood	1912 Number	1912 Value	1912 Av. Value	1912 Per Cent.	1913 Number	1913 Value	1913 Av. Value	1913 Per Cent.
		$	$ cts.			$	$ cts.	
Total	20,825,209	9,131,625	0.44	100.0	19,490,491	8,245,166	0.42	100.0
Jack pine	7,757,418	3,402,417	0.44	37.3	7,706,720	3,070,003	0.40	39.5
Douglas fir	2,026,624	593,859	0.29	19.7	2,421,118	7,799,271	0.33	12.4
White cedar	3,172,629	1,398,774	0.44	15.2	2,305,868	1,013,763	0.44	11.8
Western larch	1,196,184	514,359	0.43	5.7	1,223,444	634,742	0.52	6.3
Hemlock	1,894,711	720,109	0.38	9.1	1,180,131	448,235	0.38	6.1
Hard pine	653,896	431,900	0.66	3.1	1,136,356	619,924	0.55	5.8
Oak	930,561	621,783	0.67	4.5	963,794	660,200	0.69	4.9
Tamarack	1,772,151	786,853	0.44	8.5	838,999	355,858	0.42	4.3
Western hemlock					479,113	148,725	0.31	2.5
Spruce	818,485	325,202	0.40	3.9	450,256	148,249	0.33	2.3
Western spruce					267,917	70,688	0.26	1.4
Chestnut	266,082	157,285	0.59	1.3	232,179	126,795	0.55	1.2
Red pine	26,646	12,673	0.48	0.1	114,852	52,112	0.45	0.6
Beech	103,583	70,220	0.68	0.5	96,771	60,400	0.62	0.5
Birch	37,943	22,605	0.60	0.2	24,736	10,447	0.42	0.1
Red cedar	57,357	16,234	0.28	0.3	20,578	6,761	0.33	0.1
Maple	51,465	39,681	0.77	0.2	16,799	14,320	0.85	0.1
Elm	2,778	1,195	0.43		10,326	4,440	0.85	0.1
Ash					503	216	0.43	x
Cherry					31	17	0.55	x
White pine	44,227	14,965	0.34	0.2				
Balsam fir	12,469	1,621	0.13	0.1				

xLess than one-tenth of one per cent.

Gulf States forms an increasing proportion of the tie material imported into Canada each year. This wood does not grow in Canada and is the product of at least four different species of pines, the most valuable of which is long leaf pine (Pinus palustris). The wood of the hard pines, when used for ties, usually decays before it fails through mechanical wear, and therefore it repays the cost of a preservative treatment that will postpone this decay. Of the hard pine ties used in Canada by the steam railways in 1913, 17.5% were treated.

Western spruce is made up of two species, which are confined for the most part to British Columbia. Englemann spruce (Picea Engelmanni) is found on the Rocky Mountains and in the eastern part of British Columbia, and Sitka spruce (Picea Sitchensis) is cut on the Pacific coast. All the western spruce ties were native material, and on account of their rapid rate of decay in the ground 34% of those purchased were given preservative treatment.

Eastern tamarack (Larix laricina) is very similar to the western species and has always been a favorite tie material on account of its spike holding qualities. About half the tamarack ties were imported and none were reported to have been treated.

Western hemlock (Tsuga heterophylla) is usually considered to be a much better tie material than the eastern species, but in British Columbia, where this tree grows, it has so many rivals among the good tie timbers that it is not used to a very great extent. All the western hemlock ties were purchased in British Columbia and none were given preservative treatment.

Eastern spruce in Canada is made up of three different species that grow east of the Rocky Mouutains. All the spruce ties were of native material and none were treated.

Chestnut (Castanea dentata) is one of the most durable woods of America, although not to be classed among the hard, heavy tie materials. Practically all the chestnut ties were imported from the eastern States and none were treated.

Of the other hardwoods purchased, such as beech, birch and maple, the greater part of the ties were treated before being laid. Altogether about 12% of the ties purchased by steam railways in 1913 received some sort of treatment to prevent decay.

Table 3 gives details of the ties purchased by 32 electric railways in Canada in 1912 and 1913, by kinds of wood. While the electric railways in Canada in 1913 purchased only 2% of the ties, they paid the highest average price for their material. The total for 1913 was a decrease of 19.1% from 1912. The two cedar species in this class formed together three-fifths of the total, and jackpine, which was the most important wood used by the steam railways, was only of secondary importance. As a general rule, the more durable native woods were purchased by these companies, and the treated ties formed less than one per cent. of the total. Oak and cedar ties were imported in the largest quantities, together with all the hard pine, beech and maple.

Table 3 Kind of Wood	1912				1913			
	Number	Value	Av. Value	Per Cent.	Number	Value	Av. Value	Per Cent.
		$	$ cts.			$	$ cts.	
Total	483.362	242,195	0.50	100.0	391,223	225,086	0.58	100.0
White cedar	159,476	87,681	0.55	33.0	145,659	76,673	0.63	37.2
Red cedar	25,000	12,875	0.51	5.2	95,000	70,567	0.74	24.3
Jack pine	25,616	14,821	0.58	5.3	66,954	33,137	0.49	17.1
Tamarack	31,545	19,196	0.61	6.5	27,232	13,808	0.51	7.0
Hemlock	52,763	23,426	0.44	10 9	19,563	7,427	0.38	5.0
Oak	2,925	2,391	0.82	0.6	14,760	13,044	0.88	3.8
Spruce	24,636	10,292	0.42	5.1	8,000	2,800	0.35	2.0
Douglas fir	156,930	68,032	0.43	32.5	5,982	2,439	0.41	1.5
Elm	90	157	1.74		3,348	1,981	0.59	0.9
Western larch					2,512	1,889	0.75	0.6
Hard pine	4,200	2,940	0.70	0.9	1,995	1,108	0.55	0.5
Beech					152	152	1.00	
Maple					61	61	1.00	
White pine	181	384	2 12					

Of the oak ties reported, 9.3% were treated, as were all the imported beech and maple ties. The only western species reported were red cedar, Douglas fir and western larch. The electric railways paid on an average 16c. a tie more than the steam railways, an increase of 8c. from 1912, increasing with the cedars and with oak. All the other woods showed decreases in average cost.

About 10% of the cross ties purchased by both classes of railways were given preservative treatment to retard decay. The practice is a fairly recent one, as is seen by the fact that in 1910 practically no ties were treated at all, and that the percentage of treated material has increased steadily since that time. The treatment under present market conditions is most profitable when applied to the harder, stronger woods, that if used untreated would decay before the end of their mechanical life.

This bulletin was prepared by the Interior Department's Forestry Branch, R. H. Campbell, Director of Forestry.

Unit Office Organization on Western Lines, Canadian Pacific Railway.

By C. C. Connolly, Chief Clerk, Superintendent's Office, Canadian Pacific Railway, Cranbrook, B.C.

This subject is an important one, as the efficient handling of an office depends primarily on the organization. The method in force for handling the clerical work on a superintendent's district several years ago, and that in use now, is familiar to all in the operating department, and I question if there are any who do not appreciate the many advantages and increased efficiency that have resulted from the present organization. When I think of the practice that was in force several years ago, where each officer maintained an office and staff, and compare it with the present organization, I wonder why the present system was not thought of long before it was. When this organization was first suggested, however, there were many who did not think well of the idea, and figured that it would only be a few months until the whole office was in such a muddle that the management would be glad to go back to the old system. This looked for muddle did not materialize, although in the office I was in charge of there was a slight congestion and consequent inconvenience to some officers for a while, due principally to the staff having been reduced a little below a working basis, but a few years trial has shown that this organization has effected a decided improvement in the prompt and intelligent handling of correspondence, and this has been accomplished with a considerable saving to the company.

I believe that some of the improvement in the handling of correspondence has been due to the opportunity that has been given for the chief clerk to become familiar with all matters concerning his work, at least this has been my experience. He is in constant intercourse with all the officers, which was not the case previously, and in that way he is in touch with everything of importance that is going on in the district. A great deal of duplication of correspondence has been eliminated, and it has also made unnecessary the interchange of correspondence between district officers and the superintendent's office. I consider it still necessary for the superintendent to write certain letters or circulars to officers which contain instructions or methods to be followed concerning the work they are in charge of, which enables them to keep a small file of their own containing instructions and rulings in connection with their particular work, and which is always available to them for reference. This is preferable to handling a file from one officer to another, and avoids the possibility of important files becoming mishandled or mislaid. This simply means handing them a copy of the instructions, so each may have it, and does not in my opinion constitute in the slightest degree a deviation from the principles of this organization.

To obtain the best results in the office, the work must be systemized so that each clerk will have a certain line of work to do, be responsible for the proper performance of such work, and have sufficient to do to keep one of the average capacity constantly employed. The present organization requires a chief clerk who should attend to the correspondence concerning the various departments, consulting with the heads of these departments when necessary, and handling correspondence for them according to their advice. He should be expected to relieve the superintendent of the greater portion of his correspondence, consulting with him when necessary as to what line of action is to be followed, and then attending to the details, conscientiously doing to the best of his ability what he believes his superior expects him to do, and in no way infringing on the confidence that is placed in him; by this I mean, neglecting to do certain little things, the nonperformance of which would possibly not be noticed, but which are necessary in the best interests of the company, which we should all have at heart. A conscientious performance of such duties, as well as exercising a general supervision of the office, will keep a chief clerk and a stenographer well employed.

There should be an assistant chief clerk, who will first go through the mail to see that it is properly recorded under correct file numbers, and correct files attached, attend to tracing, and various weekly and monthly reports that it is necessary to submit to the general office, and also handle any correspondence that is assigned to him by the chief clerk. There is usually sufficient work attached to this to keep him and a stenographer constantly occupied.

Then there is a register clerk required who is to stamp and record all inward mail, attach files, and also record all outward correspondence. This is a very important post, and it is not always that we are able to fill it satisfactorily, and it is at

these times that the need of an assistant chief clerk is particularly felt, who should be required to check his work, and see that files are properly numbered and recorded. With a poor man on the register, the work for every one is made more difficult. I consider it essential that a capable clerk of mature years should be placed in this position if the best results are to be obtained, and a wage should be paid that would be sufficient to secure a man of this class, as the proper recording of the correspondence depends largely on the capability of the register clerk, and if a chief clerk is relieved of the necessity of constantly checking his work, he has more time at his disposal to attend to other matters requiring his attention.

Next in line is the junior clerk's position, which should be filled by a careful and conscientious boy, sufficiently matured to grasp the work, and feel the responsibility attached to the position, and with ambition to advance in the office. His important work is putting the files in their proper places, and addressing and sending out the mail. It is so easy for a lad in this position to cause endless trouble by misplacing files in wrong boxes, and misdirecting letters, that it is important to select a good reliable and intelligent boy, and with all this, they usually require close supervision.

Turning now to the statistical work required of a superintendent's office, a first clerk is required to attend to the clerical work affecting roadway and track. Under ordinary conditions, when all roadmasters are located at headquarters, one clerk can attend to all the work without difficulty, but in cases where there may be a roadmaster located at another end of the district he would have to have a clerk with him. He should look after all material reports, prepare track payrolls, requisitions for supplies, attend to correspondence, if any, with various foremen, and attend to any important work in the absence of the roadmaster, and do any other work that may be required of him by the roadmaster.

It is necessary also to have a bridge and building clerk who must be a good reliable fellow. He is required to prepare reports, bridge and building payrolls, distribution, and other clerical work concerning the bridge and building department, such as ordering supplies, attending to correspondence, or any other work given to him by the bridge and building master, and also look after the work during his absence on the road. At Cranbrook this clerk is also able to attend to all the clerical work required by the resident engineer, such as preparing descriptions of sites leased, appropriation requisitions, correspondence, or whatever may be required by the resident engineer; and also write what correspondence there is and look after the clerical work for the telegraph inspector.

A good clerk is required to handle the staff records, who will prepare and submit staff forms for all employes engaged, also forms closing their records, when they leave the service, as well as prepare forms, and keep proper record, for employes disciplined. This work, although receiving the requisite attention in the past few years, was sadly neglected apparently in previous years, men having been employed without proper forms being submitted, and forms not submitted closing records of men who had left the service, the result being that a large part of a staff clerk's time is at present taken up straightening out old records, which frequently means a lot of searching through old payrolls. It is, however, necessary that this should be done, as it is highly important that there should be a proper record of all employes. One of this clerk's duties should be to check over the payrolls monthly to see that all employes are properly covered by staff forms.

There is also necessary an accountant, assistant accountant, general accounting clerk, and stenographer. The stenographer is necessary to type all payrolls, vouchers, reports and whatever correspondence is handled by the accountant. The assistant accountant should keep required record and prepare station payroll, and reports connected therewith, and assist with other statements necessary in connection with the accounts. The general clerk is necessary to assist with such work, look after invoices, time checks, etc. The accountant should handle all correspondence concerning accounting matters, exercise general supervision over preparation of all payrolls, distributions, and other statistical reports for the accounting department.

The above is the personnel of the staff at Cranbrook, and as organized I think we are obtaining good results. There are possibly better methods of handling some of this work, different and more effective ideas for accomplishing certain results, and if periodical meetings of chief clerks were held, such as the one held in Calgary on March 28, and the proper interest taken in them, where suggestions and ideas can be received and discussed, much good would result for all, and the company would profit.

I am not much in favor of the present system of registering letters, and an office should not depend entirely on the register for the records of correspondence, as it is certainly a slow process to have to sit down and try to remember with whom you may have had correspondence concerning a certain subject, and then hunt through the register for an entry in order to locate the file number. An alphabetical card index record should be maintained, in addition to the register, in which should be entered all important files under the subject, several cross entries being made for the same subject so as to lessen the delay in locating it. I believe it is possible to inaugurate a better filing system for correspondence, and no doubt the time will arrive when someone will suggest some system that will be found satisfactory and be generally adopted, and a great deal of the present recording avoided.

Another matter I might mention, which is possibly foreign to the subject of my paper, is the importance of a chief clerk getting out on the road periodically and covering his district, becoming acquainted at first hand with matters that he will be called upon to deal with in the course of his daily duties. And, if possible, he should occasionally travel with his superintendent, or any one of the district officers, who are in a position to bring matters to his attention as he goes along, which might not be noticed if he were travelling alone, and it is because of the educational advantages that are to be derived that I think these trips should be made, and accompanied by someone who has the practical knowledge or experience. By being conversant with the local characteristics of the district there will be a better understanding between the superintendent and his chief clerk, in connection with the handling of the work.

The foregoing paper was read at a meeting of the chief clerks, Alberta Division, C. P.R., and after discussion the following recommendations were made:—

That the chief clerk should see all wire and letter correspondence in the morning before any letters are written.

That stenographers should type payrolls direct from the time books or sheets, instead of having them read off by another clerk.

That chief clerks should be given an opportunity to get out on the line occasionally, to enable them to become acquainted at first hand with matters dealt with by correspondence. This would be of considerable educational value to them, and the value might be enhanced by the chief clerk accompanying an officer on a trip of inspection.

Order Respecting Safety Appliances on Cars.

The Board of Railway Commissioners for Canada issued general order 128, dated July 20, as follows: Re general order 102, Feb. 17, 1913, prescribing rules and regulations respecting safety appliances on trains. Upon the report and recommendation of the Chief Operating Officer of the Board, the reading of what is filed on behalf of the C.P.R.; it is ordered that railway companies be granted an extension of time until July 1, 1916, within which to make the following changes:

To change the location of brakes on all cars to comply with the standard prescribed in the Board's regulations, dated Feb. 17, 1913.

To comply with the standard prescribed in the regulations in respect of all brake specifications contained therein.

To change cars having less than 10 ins. end ladder clearance within 30 ins. of the side of car, to comply with the said regulations.

To comply with the standard prescribed in the regulations in respect to hand holds, running boards, ladders, sill steps, and brake staffs, except that when a car is shopped for work amounting practically to rebuilding body of car, it must then be equipped according to the standards prescribed in the regulations.

And it is further ordered that railway companies be not required to make changes to secure additional end ladder clearance on cars that have 10 or more inches end ladder clearance within 30 ins. of side of car, or to make the changes in end ladders, side ladders, hand grips and steps which have been made in accordance with the provisions of sec. 264 of the Railway Act and General Order 102, or to comply with the Board's regulations aforesaid, until the car is shopped for work amounting to practically rebuilding body of car, at which time such changes must be made to comply with the standards prescribed in the order.

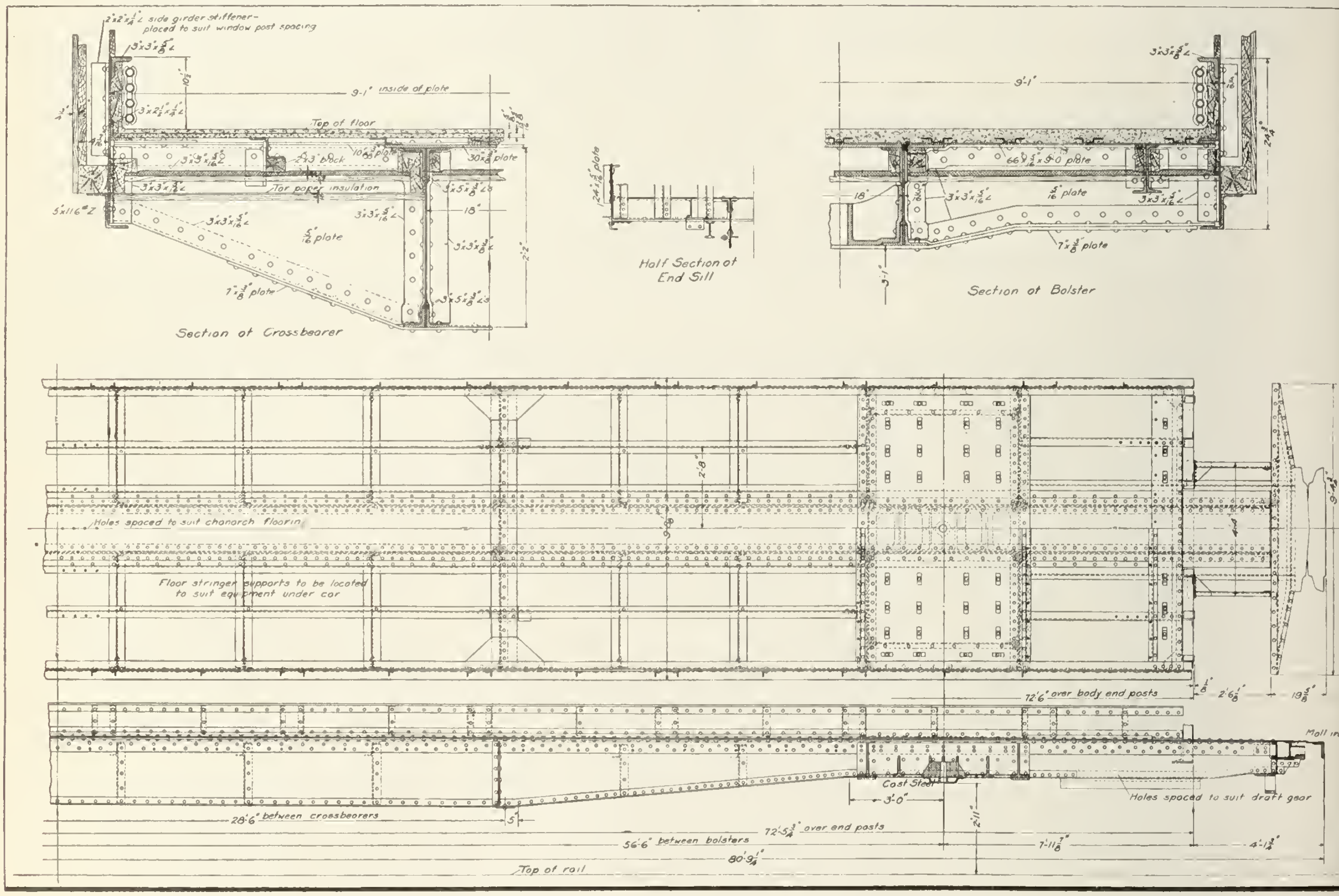
And it is further ordered that railway companies be not required to change the location of hand holds (except end hand holds under end sills), ladders, sill steps, brake wheels, and brake staffs on freight train cars where the appliances are within 3 ins. of the required location, except that when cars undergo regular repairs they must then be made to comply with the standards prescribed in the said regulations.

Boiler Insurance.—That the whole question of boiler safety is one of carefulness and maintenance, is shown by The Travellers' Boiler Insurance Co., which states that out of the money collected for insurance the following distribution is made: securing business, 25%; inspection, 50%; business expenses, 10%; profit, 5%; and loss, 10%.

A new type of tender tank has been developed on the Lehigh Valley Rd., which, it is claimed, eliminates leakage. This has been accomplished by dispensing with the bottom angle irons, flanging the bottom and side sheets to form the rivetting strips. The first cost is said to be less, as is also the maintenance, as repairs may be made without removing the tank from the trucks.

One locomotive boiler explosion per 21,000 boilers per annum is the record in the U.S. for the last two years.

Steel Underframe for Canadian Northern Railway Passenger Cars.



Details of Steel Underframe for Canadian Northern Railway Passenger Cars.

The type of steel underframe adopted by the C.N.R. is shown in the accompanying illustration, and is intended for use under all classes of passenger equipment. It is practically the same as the Barney and Smith standard design for equipment exceeding 70 ft. in length over end sills. The principal differences lie in the refinement in the method of insulation, etc., to care for the more severe climatic conditions to be encountered in the north country, and they are also arranged, as regards the height of body centre plate, to suit trucks now in use under the company's wooden passenger equipment, which has been found to be a difficult feature to embody in steel underframes of any design. The principal dimensions of the steel underframe are as follows:—

Length over buffer angles	80 ft. 9¼ ins.
Length over wooden end posts	72½ ft.
Length over steel end posts	72 ft. 5¾ ins.
Length between crossbearers	28½ ft.
Width over side sill stringers	9 ft. 10½ ins.
Width over side sill Z bars	9 ft. 8⅛ ins.
Width over steel buffer beam	9 ft. 4¾ ins.
Width between side girder plates	9 ft. 1 in.
Width over platform step stringers	4 ft. 4 ins.
Truck centres	56½ ft.
End of car (steel frame) to centre line of bolster	7 ft. 11⅞ ins.
Height, top of rail to underside of centre sill angles at bolster	3 ft. 1 in.
Height, top of rail to underside of body centre plate	2 ft. 11 ins.
Height to centre line of coupler	3 ft. 1 in.
Height, top of rail to top of platform buffer angle	4 ft. 2 11-16 ins.

The underframe is of structural steel throughout, in accordance with the American Society of Testing Materials latest specifications. The centre sill is of the fish belly girder type, with a 25½ by 5-16 in. web plate, reinforced at the top by 5 by 3 by ⅜ in. angles, inside and outside, and at the bottom by 3 by 3 by ⅜ in. angles, inside and outside, with a 30 by ⅜ in. cover plate, running the full length of the car. The side girder is composed of a main member, consisting of a 24 by 5-16 in. plate, with a 3 by 3 by ¼ in. centre angle, 3 by 3 by ⅝ in. top angle, 2 by 2 by ¼ in. angle stiffener at the side posts, and a 5 in. 11.6 lb. bottom Z bar. The top angle of the side girder has a ¾ in. camber, the side girder plate being run straight, with the top and bottom edges parallel to the rail. The rivet gauge in the top angle is 2 ins., beginning 1⅞ in. down on the web plate at each end, rising to 1⅛ in. at the centre of the car.

The crossbearers are built up on 25¼ by 5-16 in. web plates, with 10 by ⅜ in. top plates, 7 by ⅜ in. bottom cover plates connected to the side girders with 12 by 5-16 by 30 in. gussets and 3 by 3 by 5-16 in. angles, and to the centre sills with 3 by 3 by 5-16 in. angles, and having 3 by 3 by 5-16 in. top and bottom angles. The body bolsters are built up on 13½ by 5-16 in. web plates, with 66 by 5-16 in. top cover plate and 7 by ⅜ in. bottom cover plate, the centre filler and centre plate being of cast steel.

The body end sills are of 8 in. 16.25 lb. channels, with 12 by 5-16 in. top cover plate and 8 by ½ in. bottom cover plate, connected to the side girder by ⅜ in. gusset plates and having malleable iron centre filling stop to suit the buffing device. The buffer beams are composed of 6 in. 8 lb. channels inside, and 6 in. 14.75 lb. I beams outside, and fitted with 8⅝ by 5-16 in. top and bottom cover plates. The end construction is composed of 4 in. 13.8 lb. Z bar posts, with 8 by 3½ by ½ in. end plate angles connected to the Z bar posts with 5 by 5 by ⅜ in. angles.

The following weights and loads formed the basis of the design calculations:—

Assumed weight of car	140,000 lbs.
Assumed live load	5,000 lbs.
Total	145,000 lbs.
Deduction for two trucks	40,000 lbs.
Total weight of body	105,000 lbs.

This load of 105,000 lbs. was assumed to be evenly distributed over the entire length, and only the portion of the load which came between the truck centres was considered, the overhang being neglected. The latter, had it been taken into account, would have somewhat reduced the determined fibre stresses at the centre of the car, as the virtual centre to centre distance between supports in an overhanging beam is less than in an end supported beam.

With these assumptions, the maximum bending moment at the centre of the car was found to be 6,900,000 inch pounds. The side girder was calculated to have a section modulus on the compression side of 181 and on the tension side of 184. The centre sills at the centre gave a section modulus of 383 on the compression side and 420 on the tension side. The total section modulus on the tension side for the combined side sills and side girders is 604, with 564 as the section modulus for the combined members on the compression side. With the maximum bending moment of 6,900,000 inch pounds at the centre, these section moduli give a fibre stress on the tension side of 11,520 lbs. per sq. in., and on the compression side of 12,230 lbs. per sq. in. This is based on the assumption that there is no

connection between the centre sills and side girders, but it is undoubtedly a fact that the crossties, bolsters and end sills, tie these two members together in such a way that a far greater strength is obtained from them together than is apparently obtained by adding the strengths of the two members; that is, considering the steel in the side girder and centre sills as one member, and taking the centre of gravity of the entire construction, a much higher section modulus than that given would be obtained, with consequent lower fibre stresses.

It was deemed unnecessary to compute the buffing stresses, as it was considered that in an extremely long car such as this, if it is designed to take care of the loading for this span, there can be no question about the margin of safety for any buffing stresses that might develop. In addition, the spring capacity of the platform springs amounting to 42,000 lbs., and the centre line of the draft being below the centre of gravity of the section, creates a tendency to react with an upward stress at the centre of the car, which is counteracted by the superstructure weight.

We are indebted to A. L. Graburn, Mechanical Engineer, C.N.R., for the data from which the foregoing is compiled.

Birthdays of Transportation Men in September.

Many happy returns of the day to:—

G. W. Alexander, Local Treasurer, G.T.R., Western Lines, Detroit, Mich., born at Lightcliff, Yorks., Eng., Sept. 10, 1859.

H. Bailey, Bridge and Building Master, Dominion Atlantic Ry., Yarmouth, N.S., born at Huntsville, Ont., Sept. 2, 1879.

W. B. Bamford, Division Freight Agent, Atlantic Division, C.P.R., St. John, N.B., born at Belleville, Ont., Sept. 10, 1863.

G. T. Bell, Passenger Traffic Manager, G.T.R. and G.T.P.R., Montreal, born there, Sept. 7, 1861.

W. H. Biggar, K.C., General Counsel, G.T.R. and G.T.P.R., Montreal, born at The Carrying Place, near Trenton, Ont., Sept. 19, 1852.

E. R. Bremner, ex-Division Freight Agent, G.T.R., Ottawa Division, Ottawa, born at Toronto, Sept. 9, 1875.

M. H. Brown, Division Freight Agent, Ontario Division, C.P.R., Toronto, born at Victoria Square, Ont., Sept. 2, 1866.

W. B. Bulling, ex-Assistant Freight Traffic Manager, Eastern Lines, C.P.R., Montreal, born there, Sept. 16, 1858.

W. E. Burke, Assistant Manager, Canada Steamship Lines, Ltd., Montreal, born at Belleville, Ont., Sept. 23, 1881.

C. F. Burns, Auditor of Disbursements, Intercolonial Ry., Moncton, N.B., born at Clements Port, N.S., Sept. 10, 1854.

A. D. Cartwright, Secretary, Board of Railway Commissioners, Ottawa, born at Kingston, Ont., Sept. 20, 1864.

A. W. Davis. Locomotive Foreman, G.T.R., Stratford, Ont., born at Sittingbourne, Kent, Eng., Sept. 5, 1854.

A. S. Dawson, M. Can. Soc. C.E., Chief Engineer, Department of Natural Resources, C.P.R., Calgary, Alta., born at Pictou, N.S., Sept. 6, 1871.

O. L. Dickeson, President, White Pass and Yukon Route, Vancouver, B.C., born at Ottumwa, Ia., Sept. 16, 1877.

M. B. Dube, General Foreman, Transcona Shops, G. T. Pacific Ry., Transcona, Man., born at Quebec, Que., Sept. 6, 1877.

W. E. Duperow, Assistant General Passenger Agent, Grand Trunk Pacific Ry., Winnipeg, born at Stratford, Ont., Sept. 4, 1872.

W. H. Estano, Traffic Auditor, Intercolonial Ry., Moncton, N.B.', born at Halifax, N.S., Sept. 29, 1874.

C. B. Foster, Assistant Passenger Traffic Manager, Eastern Lines, C.P.R., Montreal, born at Kingston, N.B., Sept. 30, 1871.

J. P. Ferguson, representing Galena Signal Oil Co., Ottawa, Ont., born at Drummondville, Que., Sept. 12, 1856.

R. S. Gosset, Auditor of Disbursements, Canadian Northern Ry., Toronto, born there, Sept. 28, 1879.

John Gray, General Agent, G.T.R., Toronto, born at River Beaudette, Que., Sept. 28, 1863.

D. W. Hatch, Travelling Agent, Atchison, Topeka and Santa Fe Ry., Montreal, born at Bedford, Que., Sept. 1, 1841.

W. R. Howard, Chief Dispatcher and Trainmaster, District 1, Atlantic Division, C.P.R., Brownville Jct., Me., born at St. Andrews, N.B., Sept. 14, 1871.

E. Humphreys, Fuel Agent, Alberta Division, C.P.R., Calgary, born at Hull, Eng., Sept. 24, 1869.

J. E. Hutcheson, General Manager, Montreal Tramways Co., Montreal, born at Brockville, Ont., Sept. 15, 1858.

C. B. King, Manager, London St. Ry., London, Ont., and President, Canadian Electric Railway Association, born at Galena, Ind., Sept. 12, 1871.

S. King, ex Superintendent, Canadian Car and Foundry Co., Montreal, Director, National Steel Car Co., Ltd., Hamilton, Ont., now of London, Ont., born at Thetford, Norfolk, England, Sept. 12, 1853.

E. L. Landorph, Resident Engineer, C. P.R., Brandon, Man., born at Copenhagen, Denmark, Sept. 9, 1888.

R. E. Larmour, Assistant General Freight Agent, C.P.R., Vancouver, born at Brantford, Ont., Sept. 26, 1868.

H. D. Lumsden, M. Can. Soc. C. E., engineering department, C.P.R., Toronto, born at Belhaire, Scotland, Sept. 7, 1844.

G. S. Lytle, Car Service Agent, Manitoba Division, C.P.R., Winnipeg, born at Dennison, Ia., Sept. 23, 1878.

F. J. Mahon, Superintendent Telegraphs, Eastern Division, C.P.R., Montreal, born there, Sept. 18, 1865.

R. E. Merkley, Trainmaster, District 3, Saskatchewan Division, C.P.R., Saskatoon, born at Ottawa, Sept. 3, 1882.

J. F. Mundle, City Freight Agent, C.P.R., Montreal, born at Prescott, Ont., Sept. 20, 1857.

M. B. Murphy, Superintendent, District 2, Central Division, Canadian Northern Ry., Winnipeg, born at Napa, Cal., Sept. 11, 1866

K. F. Nystrom, chief draughtsman, Car Department, G.T.R., Montreal, born in Sweden, Sept. 2, 1881.

J. Paul, District Freight Agent, Canadian Northern Ry., Winnipeg, born in Euphrasia tp., Grey Co., Ont., Sept. 13, 1858.

W. J. Pickrell, Superintendent, District 2, Altantic Division, C.P.R., Aroostook Jct., N.B., born at London, Ont., Sept. 15, 1880.

C. S. Richardson, District Freight Agent, C.P.R., Buffalo, N.Y., born at New York City, Sept. 26, 1870.

W. D. Robb, Superintendent of Motive Power, G.T.R., Montreal, born at Longueuil, Que., Sept. 21, 1857.

F. W. Sterling, District Freight Agent, C.P.R., Nelson, B.C., born at Thornbury, Ont., Sept. 14, 1881.

E. W. Taylor, General Freight Agent, Reid Newfoundland Co., St. John's Nfld., born at Carbonear, Nfld., Sept. 8, 1870.

F. G. Wood, Commercial Agent, Canadian Northern Ry., St. Louis, Mo., born at Toronto, Sept. 15, 1890.

H. A. Young, Ontario Storage and Cartage, Ltd., Toronto, born at Brooklyn, N.Y., Sept. 1, 1864.

R. N. Young, Superintendent of Telegraphs, Alberta Division, C.P.R., Calgary, born at Cayuga, Ont., Sept. 4, 1870.

The War

THE shutting off of imports from Continental Europe into Canada, due to the War, gives many home industries an unexampled opportunity for immense and immediate development.

Canada will prosper at the expense of Continental Europe. This is not a time in Canada for repining on the part of the business man. We must be careful, even frugal, but we must also be bold.

Victory is to him who has courage.

Master Car and Locomotive Painters' Association of the United States and Canada.—The 45th annual convention will be held at Nashville, Tenn., Sept. 8 to 11. The subjects to be covered are, the finishing of steel passenger car equipment, rust inhibitive paints, interior finish of passenger cars, varnish for locomotive tenders, classification of passenger car paint repairs, apprenticeship in the paint shop, sand blast vs. commercial paint removers, blister proof finish for heated locomotive parts, and standard freight car lettering.

Additional Terminal Elevator at Fort William.—It was announced recently that the N. M. Patterson Elevator Co. has decided to build the first unit of 100,000 bush. capacity, of what will eventually be a 1,000,000 bush. terminal elevator, at Fort William, without delay. It will be equipped with the most modern cleaning and drying machinery. The site has been secured about 888 ft. below the G. T. Pacific Ry. swing bridge over the Kaministikwia River, and the contract has been awarded to S. J. McQueen, Fort William.

Railway Lands Patented.—During June, letters patent were issued in respect of railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Alberta Central Ry.	6.17
Calgary and Edmonton Ry.	1,603.00
Canadian Northern Ry.	1,476.45
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.	3,511.59
Total	6,597.21

Steam Railway Fatalities.—During June, 17 employes were killed in the course of their work in connection with the operation of steam railways throughout the Dominion. The fatalities were caused, as follows:—Run over by locomotives, cars or trains 10, head on collisions 5, derailment of locomotive 1 and by falling from a train 1.

Many cases of bad clinkering and honeycombing have been eliminated by giving the locomotive ashpan more opening. Where brick arches are used, no trouble is experienced. Boilers in poor condition, with leaky flues, full of scale, or with rough projections, are more liable to honeycomb than if in good condition.

Experiments with locomotives have shown that after a relation of 0.14 sq. ft. of air inlet per sq. ft. of grate was reached, no further decrease of draught occurred when the air inlets were increased; and when the air inlets were less than 0.11 sq. ft. per sq. ft. of grate, the draught necessary to supply air increased very rapidly.

One pound of coal used in a freight locomotive will provide enough energy to carry one ton 15 or 16 miles, and in a modern train it will be fed the boiler every 52 ft. of distance travelled.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

General order 127, July 6.—Directing that cabooses of all railway companies subject to Board's jurisdiction be equipped as follows:—where cabooses are equipped with marker sockets in lower position, markers to be carried in such lower sockets; all cabooses hereafter built to be equipped with marker sockets in lower position; all cabooses now in use not equipped with marker sockets in lower position, shall be so equipped by Nov. 1, 1914.

General order 128, July 20.—Extending to July 1, 1916, time within which railway companies subject to the Board's jurisdiction shall make certain changes in respect to safety appliances on trains.

General order 129, July 22.—Prescribing certain regulations in connection with increased special and competitive freight and express tolls and suspensions thereof.

General order 130, July 28.—Disallowing schedules of Boston and Maine Rd., C.P.R., Central Vermont, G.T.R., G.T.P.R., G.N.R., Maine Central Rd., Michigan Central Rd., Rutland Rd., N.Y.C. & H.R. Rd., T.H. & B.R., and Wabash Rd., in so far as their purpose is to increase tolls previously charged for exclusive use of drawing rooms or compartments in sleeping and parlor cars locally between points in Canada.

General order 131, Aug. 6.—Prescribing certain regulations in regard to locomotive defects and requiring railway companies on or before Jan. 1, 1915, to equip locomotives with double windows in front of cabs during winter season, Nov. 1 to Apr. 30, same to be made air tight.

22102. July 2.—Dismissing application of Fort Garry rural municipality, Man., for order directing Canadian Northern Ry. to provide suitable subway under its tracks where it crosses Pembina highway, Winnipeg.

22103. July 2.—Dismissing application of Manitoba Sand and Gravel Co., Winnipeg, for order directing G.T. Pacific Ry. to amend its Special Freight Tariff, C.R.C. 279, Nov. 21, 1912, as to item 10, page 5, so as to provide an equitable rate on sand and gravel from Vivian station, Man., to Winnipeg.

22104. July 2.—Approving location of G.T. Pacific Branch Lines Co.'s station at Mountpark, mileage 56.1, Alberta Coal Branch.

22105. July 2.—Extending for six weeks from date, time within which Canadian Northern Ry. and G.T. Pacific Ry. shall install gates at First St. and Namayo Ave., Edmonton, Alta., as provided by order 20874, Nov. 20, 1913.

22106. July 2.—Relieving Canadian Northern Ry. from speed limitations on its line between Morinville and Athabasca Landing, Alta.

22107. July 2.—Ordering C.P.R. to build highway crossing over its line at main road between Lots 4 and 5, Oliver Tp., Ont.; half cost to be paid by municipality.

22108. July 3.—Rescinding order 21870, May 26 re Duluth, South Shore and Atlantic Ry. tariff C.P.R. 331, as to what constitutes proper filing under Sec. 335 of Railway Act, to be spoken to generally at traffic sittings of Board at Ottawa in September.

22109. July 2.—Authorizing C.P.R. to open for traffic its Gleichen-Shepard Branch from Gleichen to Shepard, mileage 0 to 40.84, Alta.

22110. July 3.—Amending order 19793, July 12, 1913, re revised location of C.P.R. Thompson Subdivision, near Kamloops, B.C.

22111. July 2.—Authorizing C.N. Ontario Ry. to cross public road on spur to ballast pit, between Lots 96 and 48A, St. Andrews Parish, Que., with two loading tracks.

22112. July 3.—Dismissing Canadian Northern Ry. application for repeal of order 20808, Nov. 13, 1913, re division of Rue La Vernadrye, St. Boniface, Man.

22113. July 2.—Relieving C.N. Ontario Ry. from speed restrictions on its Toronto-Ottawa Line, between Chaffeys Locks and Ottawa, and between Harrowsmith and Perth Road Pit, and ordering that trains be required to occupy 40 minutes between Perth Road Pit and Chaffeys Locks, 11.4 miles.

22114. July 2.—Ordering Canadian Northern Ry. to remove trees from crossing, according to sight lines indicated by number of feet on sketch on file with Board, between Lots 28 and 29, Darlington Tp., mileage 38.3, and that clay bank on southeast corner of crossing, and small portion of bank on southwest corner, be sloped down.

22115. July 3.—Approving agreement between Bell Telephone Co. and Harrietsville Telephone Association, June 15.

22116. July 2.—Authorizing Lake Erie and Northern Ry. to build across G.T.R. at station 7+23, Brantford, Ont.

22117. July 3.—Extending the free collection and delivery limits of Dominion Express Co. in Swift Current, Sask., and rescinding order 20463, Sept. 30, 1913.

22118. July 2.—Approving location of G.T. Pacific Branch Lines Co.'s station at Lawson, Sask.

22119. July 2.—Approving location of Toronto Terminals Ry. line between York St. and Don River, mileage 1.50 to 3.26, Toronto, and authorizing it to expropriate certain lands, and rescinding order 21543, March 19.

22120. July 3.—Amending order 21937, May 29, re G.T. Pacific Ry. stations, etc., between Tofield and Deville, Alta.

22121. May 26.—Amending order 21780, May 7, re half interlocker at crossing of G.T.R. by Berlin and Northern Ry. at Bridgeport St., Berlin, Ont., substituting Lancaster for Bridgeport.

22122. July 2.—Ordering C.P.R. to provide highway crossing about 500 ft. west of switch at Verwood, Sask.; work to be completed by July 31.

22123. July 3.—Authorizing C.P.R. to open for traffic its Port Moody Branch from mileage 0 to 3.24, B.C.

22124. July 3.—Authorizing City of Winnipeg to build subway under C.P.R. at Salter St.

22125. July 3.—Authorizing Canadian Northern Ry. to build spur for David Bowman Coal and Supply Co., Ltd., in s.w.¼ sec. 18-18-4, w.p.m., Man.

22126. July 7.—Ordering Esquimalt and Nanaimo Ry. to build level crossing at Alder St., Riverside townsite, Cowichan Lake, B.C.

22127. July 2.—Rescinding order 22052, June 23, re interchange tracks between G.T.R. and Galt, Preston and Hespeler St. Ry., and providing cost of same be apportioned as follows:—At Waterloo, 85% by G.T.R., balance by G.P. and H.S.R.; at Berlin, 90% by G.P. & H.S.R., balance by G.T.R.; at Preston, 80% by G.T.R., balance by G.P. & H.S.R.; at Galt, whole by G.T.R.

22128. July 4.—Dismissing application by Lac du Bonnet village, Man., to reconsider order 21926, May 26, for order requiring C.P.R. to build platform there.

22129. July 2.—Authorizing C.P.R. to build spur for C. C. Snowdon, Winnipeg.

22130. July 3.—Ordering C.P.R. to build highway crossings over tracks on Lots 74 and 78 St. Andrews rural municipality, Man.; cost of construction and maintenance to be paid by municipality, work to be completed within one month.

22131. July 3.—Authorizing C.P.R. to open for traffic its double track from mileage 1 to Mantle, mileage 12, Moose Jaw Subdivision, Sask.

22132. July 2.—Relieving Canadian Northern Ry. from speed restrictions on its Vegreville-Calgary line from mileage 15 to 48, and mileage 75 to 173; trains between mileage 48 and 75 limited to 22 miles an hour.

22133. July 2.—Authorizing C.N. Ontario Ry. to take, for ditch diversion, portion of Lot 81, St. Dorothee Parish, Que.

22134.—July 3.—Ordering Dominion Atlantic Ry. to employ watchman to protect crossing immediately west of station at Waterville, N.S., when trains are passing through without stopping.

22135. July 3.—Ordering Dominion Atlantic Ry. to install improved type of automatic bell at crossing of public road from Cambridge, to Waterville, 20% of cost to be paid out of the railway grade crossing fund; provision to be made to have bell cut out at station when train is standing at platform.

22136. June 26.—Authorizing C.N. Ontario Ry. to connect with G.T. Ry. near Ottawa, Ont., connection to be operated subject to G. T.R. terms of consent.

22137. July 4.—Approving location of C.P.R. station at Edgewater, B.C., mileage 59.5, south of Golden, on Kootenay Central Ry.

22138. July 6.—Authorizing C.P.R. to build spur for Ford Motor Co., London, Ont.

22139. July 6.—Approving plan A showing interlocking plant at crossing of Canadian Northern Ry. by C.P.R., mileage 5.6, Brandon Subdivision, at Woodman, Man.

22140. July 6.—Authorizing C.P.R. to build siding for Peters' Coal Co., east of Runnymede Road, mileage 5.70, London Subdivision, Ont.

22141. July 6.—Authorizing C.P.R. to rebuild bridge 42.9, over Nottawasaga River, near Alliston station, Ont.

22142. July 4.—Authorizing C.P.R. to build road diversion between Secs. 21 and 28, at grade, across its tracks, in Sec. 28-2-13, at Milk River, Alta.

22143. July 3.—Authorizing C.P.R. to build spur 250 ft. long from its main spur, and another spur 400 ft. long, for Winnipeg Paint and Glass Co., Kildonan Parish, Man.

22144. July 4.—Extending to Aug. 31, time within which C.P.R. shall complete siding for McCormick Mfg., Co., London, Ont.

22145. July 3.—Amending order 21778, May 7, re protection of crossing of Berlin and Northern Ry. by G.T.R. at Wellington St., Berlin, Ont.

22146. July 3.—Authorizing G.T. Pacific Ry. to build spurs for Ferintosh Gravel Co. and Inglis, McDonald and Thom, Edmonton.

22147. July 4.—Ordering G.T.R. within 60 days to install improved type of automatic bell at crossing at St. Hubert, Que., to protect both tracks, 20% of cost to be paid out of railway grade crossing fund.

22148. July 6.—Authorizing Algoma Central and Hudson Bay Ry. to build bridge at mileage 50.40, Tp. 25, R. 22, Algoma District, Ont.

22149. July 6.—Authorizing Algoma Central and Hudson Bay Ry. to build bridge across Kiniwabie River, mileage 150.61, Tp. 28, R. 22, Algoma District, Ont.

22150. July 4.—Rescinding order 21750, May 1, re arbitration proceedings regarding alleged damage to Heward Estate, Toronto, by building of C.P.R. spur, and appointing three arbitrators in lieu of one.

22151. July 7.—Extending for one month from July 18, time within which C.P.R. shall install bell at crossing of highway at Port Hammond, B.C.

22152, 22153. July 4.—Approving plans showing interlocking plants at crossing of C.P.R., Winnipeg Branch Subdivision, and its Arborg Subdivision, by its Bergen Cutoff, Man.

22154. July 6.—Authorizing Canadian Northern Ry. to build transfer track to connect with G.T. Pacific Branch Lines Co.'s line at Regina, Sask.

22155, 22156. July 2.—Approving Calgary and Fernie Ry. location from mileage 47.5 to 95, and from mileage 40 to 47.5, Alta.

22157. July 7.—Authorizing C.P.R. to build siding for G. W. Upham, Odell River, N.B.

22158. July 7.—Authorizing C.P.R. to cross road allowance by subway between Secs. 22 and 23-39-22, w.4.m., Alta., mileage 31.2, Lacombe Subdivision.

22159. July 8.—Ordering Esquimalt and Nanaimo Ry. to build highway over its line at Church St., South Wellington, B.C.; cost to be paid by British Columbia Public Works Department.

22160. July 8.—Ordering C.N. Ontario Ry. to provide undercrossing for H. Ray, March Tp., on his complying with certain conditions; and rescinding order 21387, Feb. 16.

22161. July 7.—Ordering that crossings of Syndicate and Alberta Aves., Edmonton, Alta., be protected by gates installed by Canadian Northern and G.T. Pacific Rys., to be operated by day and night watchmen; and apportioning cost of installation and maintenance.

22162, 22163. July 6, 7.—Approving agreements between Bell and Alice Telephone Cos., of May 21, and Bell Telephone Co. and Wallacetown and Lake Shore Telephone Association, June 22.

22164. July 6.—Authorizing Greater Winnipeg Water District to join its tracks with Canadian Northern Ry. at three points, and to build a temporary junction at another point.

22165. July 8.—Authorizing Canadian Northern Ry. to build spur at mileage 255.1, northerly to connect with Canada Cement Co.'s spur and proposed transfer track between C.P.R. and C.N.R., Calgary, Alta.

22166. July 8.—Authorizing G.T.R. to use bridge 77, over Opeongo River, and also Rose Point swing bridge, Rose Point, Ont.

22167. July 8.—Authorizing Kettle Valley Ry. to build across highway at mileage 53.5, Hydraulic Summit westerly to Penticton, B.C.

22168. July 8.—Approving location of C.N. Ontario Ry. proposed entrance to Toronto, mileage 251.84 to 253.73, Queen St.

22169. July 10.—Authorizing C.N. Western Ry. to build across C.P.R. in Medicine Hat, Alta.

22170. July 9.—Authorizing Canadian Northern Ry. to build temporary steel spans across Bears Pass, Halkirk Tp., Ont., pending completion of permanent structure.

22171. July 9.—Amending order 21979, June 13, re installation of automatic electric bell by Pere Marquette Rd., at crossing of Head St., Chatham, Ont.

22172. July 8.—Approving Calgary and Fernie Ry. location from Lot 8493, Kananaskis Pass, B.C., southerly to Lot 4135, mileage 0 to 63; Board reserving right to have line operated by railways interested, as a joint section.

22173. July 10.—Authorizing C.N. Ontario Ry. to cross highway between Lots 11 and 12, Junction Gore, Gloucester Tp., with transfer track connecting G.T.R.

22174. July 9.—Extending, until Oct. 31, time within which C.P.R. shall complete branch line for J. L. Abbott, Toronto.

22175. July 9.—Authorizing Kettle Valley Ry.

to build across certain highways in Penticton, B.C.

22176. July 13.—Approving Erie and Ontario Ry. location from Toronto, Hamilton and Buffalo Ry. near Smithville, Ont., to northerly limit of Dunnville, Ont.

22177. July 10.—Extending to Sept. 20 time within which C.P.R. shall install bell at crossing of Albert St., Alliston, Ont., as required by order 21865, May 20.

22178. July 11.—Authorizing C.P.R. to build its Bassano Easterly Branch at grade across trail at mileage 116.62, n.w. ¼ Sec. 14-23-1, w. 4 m., Alta., on condition that when survey of trail is made crossing be moved to new location if necessary.

22179. July 8.—Ordering Canadian Northern Ry. and C.P.R. to rearrange interchange tracks at Canada Cement Co.'s premises, Calgary, Alta.

22180. July 13.—Authorizing C.P.R. to open for traffic its Kalso and Slocan Branch between Bear Lake and Kaslo, mileage 5.2 to 25.8; speed of trains limited to 15 miles an hour.

22181. July 8.—Authorizing C.P.R. to build siding for Eagle Lumber Co., Montreal.

22182. July 14.—Authorizing C.P.R. to open for traffic its double track, mileage 66.5 to 68.5, Moose Jaw Subdivision, Sask.

22183. July 13.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) until Oct. 31 to operate over crossing of Oshawa Electric Ry. at Prospect St., Oshawa, Ont., crossing to be protected by flagman appointed and maintained by C.L.O. and W. Ry.

22184. July 13.—Authorizing C.P.R. to build spur for West Canadian Collieries, Ltd., Blairmore, Alta.

22185. July 10.—Extending to Oct. 31 time within which C.P.R. shall complete spur for Balsam Lake Quarries, Ltd., Eldon Tp., Ont.

22186. July 8.—Authorizing C.P.R. to build bridge 89.0 near Woodstock, Ont.

22187. July 14.—Authorizing G.T.R. to build siding and spurs for J. R. Eaton & Sons, West St., Orillia, Ont.

22188. July 10.—Ordering G.T.R., within 60 days, to install improved type automatic bell at crossing of Wilmot St., Berlin, Ont., 20% of installation to be paid out of railway grade crossing fund, remainder by company.

22189. July 10.—Disallowing notice cancelling exception of interswitching service between G.T.R. sidings on town spur at Fergus and C.P.R. from operation of General Interswitching order 4988, July 8, 1908, and effective Apr. 15, 1914, by Supplement 15, to G.T.R. Special Tariff C.R.C. no. E.2457, and ordering that toll of $3 a car for said service, as published in tariff E.2457, be restored on lawful notice within 10 days from date.

22190. July 8.—Approving plan and specifications of ditch to be built along G.T.R. right of way, Woodhouse Tp., Ont.

22191. July 8.—Extending to Oct. 8 time within which G.T.R. shall complete spur for Grant and Jones, Rama Tp., Ont.

22192. July 10.—Approving clearances, as shown on G.T.R. plan, between siding for Alabastine Co., Paris, Ont.

22193. July 8.—Authorizing G.T.R. to build siding and spurs therefrom, for Coniagas Reduction Co., Lots 27 and 28, Thorold Tp. Ont.

22194. July 8.—Approving location and details of G.T.R. freight and passenger station at Aubrey, Que.

22195. July 13.—Authorizing G.T.R. to build siding for Chaudiere Lumber Co., St. Jean, Chrysostome Parish, to connect with John Breakeys' siding on Lot 316; and to build transfer track on lot 257, Notre Dame du Perpetual Secours de Charny Parish, Que.

22196. July 10.—Extending, for 30 days from July 18, time within which G.T.R. shall complete work re approach to Bergevin's crossing between Danby and South Durham, Ont., as required by order 21836, May 18.

22197. July 13.—Approving location and details of new G.T.R. passenger and freight stations at St. Polycarpe, Que., Dalkeith, Ont., and Lacolle, Que.

22198. July 10.—Authorizing G.T.R. to build additional tracks along Neeve and Farquhar Sts., Guelph, Ont., and to change location of certain tracks.

22199. July 3.—Authorizing Lake Erie and Northern Ry. to build across Toronto, Hamilton and Buffalo Ry. in Brantford, Ont.; L.E. and N.R. to place diamond in T.H. and B.R. at crossing, and crossing to be protected by interlocking plant, plans of which are to be submitted for approval.

22200. July 11.—Ordering that packages containing celluloid (except liquid celluloid and celluloid scrap), also articles composed wholly or partly of celluloid, for carriage by express between points in Canada, be conspicuously labelled "celluloid—inflammable"; also that carriage of liquid celluloid and celluloid scrap by express be prohibited, and that Express Classification for Canada be forthwith amended accordingly.

22201. July 13.—Approving Maine Central Rd. bylaw authorizing certain persons to prepare and issue tariffs of tolls, and rescinding order 15821, Jan. 10, 1912, in similar connection.

22202. July 8.—Authorizing C.N. Ontario Ry. to cross Albany Road, Toronto, by a subway.

22203. July 14.—Authorizing C.P.R. to rebuild bridge 3.6, Prescott Subdivision, Ont.

22204. July 8.—Authorizing C.P.R. to build relocation of existing spur and extension for Calgary Brewing and Malting Co., Macleod, Alta.

22205. July 9.—Authorizing C.P.R. to change location of Pembina lead track across Higgins Ave., Winnipeg, Man.

22206. July 14.—Ordering G.T.R., within 60 days, to install improved type of automatic bell at crossing of James St., Brampton, Ont., 20% of cost to be paid out of the railway grade crossing fund.

22207. July 14.—Approving location of C.P.R. station at Athalmer, B.C.

22208. July 13.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate over crossing of G.T.R., in Whitby, pending installation of interlocking plant required under order 17092, crossing to be protected by watchmen by C.L.O. and W. Ry.

22209. July 14.—Authorizing C.P.R. to build highway crossing over its line between Secs. 24-31-2 and 19-31-1, w. 5 m., Alta.

22210. July 6.—Authorizing Greater Winnipeg Water District to use in common with C.P.R., G.T.P.R. and C.N.R., Paddington transfer tracks.

22211. July 14.—Amending orders 16700, June 1, 1912, and 21938, May 29, 1914, re railway crossing on Spruce Ave., Edmonton, Alta.

22212. July 17.—Authorizing C.P.R. to build spur for Medicine Hat Planing Mill Co., Medicine Hat, Alta.

22213. July 18.—Authorizing City of Vancouver, B.C., to build Drake, Davie, Helmcken, and Hamilton Sts., and street not yet named, along and across C.P.R.

22214. July 13.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.,) within 60 days, to install improved type of automatic bell at crossing of Kingston Road, one mile east of Belleville, Ont.

22215. July 14.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) forthwith to fill in sag in creek crossing T. H. Bickle's farm, Darlington Tp., Ont., with gravel, and raise grade at creek 18 ins.

22216. July 17.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) and G.T.R. to operate over crossings at mileage 119.90, 119.91, and 120.02, Cobourg, Ont., until Nov. 24, pending installation of interlocking plants, trains to stop before crossing diamonds and be flagged over by trainmen.

22217. July 16.—Authorizing G.T.R. to operate automatic block signals on Victoria Jubilee Bridge, Montreal.

22218. July 18.—Authorizing G.T.R. and Ottawa Electric Ry. to operate over interlocking plant at crossing on Broad St., Ottawa, Ont.

22219. July 18.—Authorizing Victoria Harbor village, Ont., to build highway over G.T.R. near station, at G.T.R. expense, company to install gate on east side of crossing.

22220. July 16.—Ordering that G.T.R. tariffs applicable on coal, in carloads, from Niagara Frontier and Detroit, be amended to apply to York, Ont.; rates shown as applying to Toronto; amendments to take effect by Sept. 1.

22221. July 15.—Relieving G.T.R. from providing further protection at crossing of first public highway east of south junction, Lindsay, Ont.

22222. July 17.—Ordering G.T.R., within 30 days, to rebuild fences on its Parry Sound Division, between certain mileages, and to clear grass, weeds, and underbrush from right of way.

22223. July 17.—Authorizing city of Fort William, Ont., to make alterations in Canadian Northern Ry. between Franklin and Donald Sts., Fort William, Ont.

22224. July 16.—Approving C.N. Alberta Ry. location through Tps. 46-45, r. 1-4, w.6.m., mileage 222.79 to 251.38, excepting from mileage 242 to 245.

22226. July 18.—Authorizing C.P.R. to build extension to siding for National Portland Cement Co., Brant Tp., Ont.

22227. July 15. Authorizing C.P.R. to open for traffic its double track from mileage 28.0 to 32.2, Broadview Subdivision, Sask.

22228. July 20.—Ordering that Thornton, instead of Hinton, Alta., be junction point of prairie and mountain, rates to be charged by G.T. Pacific Ry., as prescribed in the Board's judgement of Apr. 6.

22229. July 14.—Authorizing Montreal and Southern Counties Ry. to build across C.P.R. on Lot 34; M. & S.C.R. to pay cost of derails and signals.

22230. July 20.—Establishing Dominion Express Co. collection and delivery limits in Milestone, Sask.

22231. June 30.—Extending express delivery and collection limit in St. Boniface, Man., and rescinding order 19849, May 30, 1913, defining previous limits.

22232. July 16.—Rescinding orders 21706, Apr. 21, and 21930, June 4, re C.P.R. clearences at West Toronto, Ont.

22233. July 16.—Dismissing complaint of Mrs. K. S. Massiah, Lachute, Que., against C. P. R. train service between Lachute and Montreal.

22234. July 16.—Rescinding order 22058, June 25, and authorizing Campbellford, Lake Ontario and Western Ry. (C. P. R.) to build its Trenton spur across certain streets in Trenton, Ont., and to close and divert certain streets.

22235. July 18.—Authorizing C. P. R. to use bridge 15.3 over Isaac Creek, Arrow Lake Subdivision, B. C.

22236. July 18.—Approving 13 standard plans of Edmonton, Dunvegan and British Columbia Ry.

22237. July 18.—Ordering G. T. R. and C. P. R. to file special tariffs of "arbitrary" rates, to take effect by Sept. 1, re lumber and forest products from Ohio and Mississippi River crossings to rate basing points in Canada.

22238. July 18.—Authorizing C. P. R. to use bridge 16.9, near Ops, Ont.

22239. July 21.—Approving location of C. P. R. station, at Eastend, mileage 253, Weyburn-Stirling Branch, Sask.

22240. July 18.—Authorizing C. P. R. to build siding for Toronto Plaster Co., in Nichol Tp., Ont.

22241. July 21.—Authorizing Canadian Northern Ry. to build two temporary spurs in connection with building of Government terminal elevator, Calgary, Alta.

22242. July 20.—Authorizing Canadian Northern Ry. to build spur for Builders' Supply Co., through Secs. 12, 11, and 2, Tp. 15, R. 3, w.p.m., Man., and to cross highway.

22243. July 18.—Approving specifications for timber structures on Edmonton, Dunvegan and British Columbia Ry.

22244. July 21.—Ordering G. T. Pacific Ry. and C. P. R. to build transfer track at Frobisher, Sask., work to be completed within 60 days after approval of plan to be submitted by C. P. R.

22245. July 21.—Authorizing G. T. Pacific Ry. to divert road at mileage 543.6 west of Winnipeg, in rural municipality 378, Sask.

22246. July 22.—Extending express collection and delivery limits in Winnipeg, Man., and rescinding order 18413, Dec. 31, 1912, defining original limits.

22247. July 18.—Dismissing application of Lake Erie and Northern Ry. for approval of location of station in Brantford, Ont.

22248. July 22.—Authorizing C. P. R. to build bridge 60.7 on Esquimalt and Nanaimo Ry., B. C.

22249. July 22.—Authorizing City of Calgary, Alta., to build 34th Ave. across C. P. R., at grade.

22250. July 22.—Authorizing C. P. R. to build sidings for Shawinigan Water & Power Co., Montreal.

22251. July 22.—Authorizing Montreal and Southern Counties Ry. to build bridge over highway on east side of Yamaska River, St. Cesaire Parish, Que.

22252. July 20.—Authorizing Bell Telephone Co. to erect telephone lines on south side of Ann St., Exeter, Ont.

22253. July 22.—Authorizing Glengarry and Stormont Ry. to build at grade, across 5 highways, St. Telesphore Parish, Que.

22254. July 22.—Extending for three months from Aug. 1, time for G. T. R. to complete subway at Brock Ave., Toronto.

22255. July 22.—Ordering that gates at crossing of Lake Shore Road by G.T.R. and C.P.R., at Vaudreuil, Que., be operated by day watchmen, excepting during July, August and September, when day and night watchmen are to be employed.

22256. July 22.—Authorizing C. P. R. to open for traffic its Lacombe Easterly Branch between Monitor and Kerrobert, mileage 149 to 221.3, speed of trains limited to 20 miles an hour.

22257. July 23.—Authorizing C. P. R. to build, at grade, its Colonsay Subdivision across Prince St., Imperial, Sask., at mileage 83.

22258. July 23.—Ordering C. P. R. to build spur for Western Cooperage Co., Calgary, Alta.

22259. July 23.—Authorizing C. P. R. to use bridge over Syndicate Ave., Fort William, Ont.

22260. July 24.—Authorizing Canadian Northern Ry. to build spur across Victoria Ave., Brandon, Man.

22261. July 23.—Authorizing Canadian Northern Ry. to build spur for McKellar Bedding Co., Fort William, Ont.

22262. July 23.—Extending to Dec. 31, time for Cumberland Ry. and Coal Co. to equip its cars with automatic couplers and air brakes.

22263. July 18.—Authorizing G. T. R. to build siding and spur therefrom into City Water Works Property, Montreal.

22264. July 24.—Authorizing G. T. Pacific Ry. to build elevator track at Hawoods, Sask., across road allowance.

22265. July 24.—Authorizing Crows Nest Southern Ry. to build bridge 4 over British Columbia Southern Ry., near Elko, B. C.

22266. July 24.—Approving location of Erie and Ontario Ry. in Dunnville, Ont., from station 726 to 771.58.

22267. July 24.—Dismissing application of

Peterboro Machine and Lubricator Co. to rescind order 15660, Dec. 20, 1911, re C. P. R. spur for T. Kinnear & Co., Peterboro, Ont.

22268. July 28.—Authorizing C. P. R. to build its ballast pit spur at Federal, Alta., at grade, across two highways.

22269. July 23.—Authorizing C. P. R. to build spur for H. G. Parson, Ltd., Golden, B. C.

22270. July 23.—Authorizing C. P. R. to construct bridge 94.26 on Kootenay Central Ry. over Columbia River, B. C.

22271. July 25.—Extending to Sept. 1, time for Esquimalt and Nanaimo Ry. to file standard tariff of maximum freight tolls for Board's approval.

22272. July 27.—Approving C. P. R. clearances of steelwork at bridge 1.7, Shuswap Subdivision, B. C.

22273. July 24.—Ordering Canadian Northern Ry. to build spur from its line in Sec. 4-39-19, w.4m., and authorizing it to exercise right to use such part of C. P. R. property necessary to make physical connection; right of way to be arranged between the parties.

22274. July 23.—Authorizing G. T. Pacific Ry. to build highway across its Lake Superior Branch, between Lots 15 and 16, Neebing Tp., Ont.

22275. July 27.—Dismissing Port Hope Telephone Co. application for ruling that it is not competitive with Bell Telephone Co., and for order for connection for interchange of business at Bowmanville, Ont.

22276. July 27.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur in Hamilton, Ont., to and through city lands, to Fowlers' Canadian Co.

22277. July 28.—Authorizing G. T. Pacific Branch Lines Co. to build Government road across its Cutknife Branch, mileage 5.5, Sask.

22278. July 23.—Authorizing Oshawa Ry., Toronto Eastern Ry., and Canadian Northern Ry. to operate over crossing on Ritson Road, Oshawa, Ont.

22279. July 28.—Dismissing complaint Smart-Woods, Ltd., Winnipeg, Man., alleging that delivering carriers at Winnipeg disclaim responsibility for shortage of goods received by them "short" from their connections.

22280. July 23.—Authorizing Dominion Atlantic Ry., to rebuild bridge over Sissiboo River, Digby, N. S.

22281. July 23.—Approving Kettle Valley Ry. location from mileage 49 to 69, west of Penticton, B. C.

22282. July 23.—Authorizing Lake Erie and Northern Ry. to divert highway from station 438+57.8, northerly parallel to Grand Valley Ry., for 1430 ft. to connection with River Road, South Dumfries Tp., Ont.

22283. July 25.—Authorizing C. N. Ontario Ry. to build bridge over Obakagami River at mileage 285.51 east of Port Arthur.

22284. July 25.—Approving plans and specifications of drainage to be built under or across Michigan Central Rd., on Lot 19, Con. 9, Yarmouth Tp., Ont.

22285. July 22.—Relieving Canadian Northern Ry. from providing further protection at first highway crossing east of Dummer Station, Sask.

22286. July 28.—Extending to Sept. 10, time for C. P. R. to install bell at first highway crossing east of Central Ontario Jct., as required by order 21757, May 4.

22287. July 28.—Approving C. P. R. plans of Chambers St. subway, Smiths Falls, Ont.

22288. July 28.—Extending for 30 days from date, time for C. P. R. to install bell at crossing of Laviolette Ave., Three Rivers, Que.

22289. July 29.—Approving location of C. P. R. station at Coquitlam, B. C.

22290. July 28.—Dismissing Fonthill Gravel Co. application for order reducing rates on moulding sand from Fonthill to Toronto, over Niagara, St. Catharines and Toronto Ry., and G. T. R.

22291. July 28.—Approving revised location of G. T. Pacific Branch Lines Co.'s Regina-Moose Jaw Branch from mileage 40.92 to 41.38, Moose Jaw District, Sask.

22292. July 28.—Dismissing complaint of Edmonton and Clover Bar Sand Co., Edmonton, Alta., against G. T. Pacific Ry. rate on sand and gravel from Clover Bar to Edmonton.

22293. July 17.—Ordering C. P. R. to reopen farm crossing over its line, on property of E. Hume, Bolton Tp., Que., and authorizing it to reopen farm crossings for Mrs. A. Hillhouse and E. I. Booth, Bolton Tp., at their expense, work to be completed within ten days.

22294. July 24.—Amending order 22160, July 8, re C. N. Ontario Ry. undercrossing for H. Ray, March Tp., to provide that he shall deposit to the Board's credit $500 as a bond.

22295. July 23.—Authorizing C. P. R. to build spur for International Supply Co., Medicine Hat, Alberta.

22296. July 27.—Ordering Canadian Northern Ry. to build spur 1,900 ft. long to connect with spur serving Estevan Coal and Brick Co., as soon as its Bienfait-Estevan Branch is open.

22297. July 29.—Authorizing Canadian Northern Ry., until Nov. 30, to open for traffic its North Battleford Northwesterly line from Edam to Turtleford, mileage 38 to 57, speed of trains limited to 15 miles an hour.

22298. July 31.—Authorizing Esquimalt and Nanaimo Ry. to open for traffic its line from McBride Jct. to Courtenay, Vancouver Island, B. C., and rescinding order 20546, Oct. 13.

22299. July 30.—Dismissing G. T. R. application for authority to build spur for Elias Rogers Co., Toronto, at grade across Toronto, Grey and Bruce Ry. (C. P. R.) south of St. Clair Ave., Toronto.

22300. July 28.—Authorizing Toronto Eastern Ry., and Oshawa Ry., for 6 months from Aug. 6, to operate over crossings in Oshawa, Ont.

22301. July 29.—Amending order 22097, July 3, which in part authorized the building of C. P. R. Swift Current Southwesterly Branch across highways between mileage 43.97 and 46.56, by substituting Moose Jaw for Swift Current.

22302. July 27.—Ordering G. T. Pacific Ry. to carry out certain conditions for providing sufficient accommodation and facilities at Spruce Grove, Alta.

22303. July 31.—Ordering that spur between King St. and Pembina Bridge, Entwistle, Alta., be removed, that spur for 5 cars be built east of King St., with trailing point switch toward King St.; G. T. Pacific Ry. to handle carload freight for Entwistle at that point.

22304. July 31.—Authorizing City of Toronto to rebuild bridge, partly in city and partly in York Tp., carrying highway over G. T. R.; 60% of cost to be paid by city, 20% by York Tp., and 20% by G. T. R.; cost of maintenance to be paid by Toronto.

22305. July 31.—Authorizing Winnipeg, Selkirk and Lake Winnipeg Ry. to build its Middlechurch Branch to Stonewall, across C. P. R. spur to stone quarry at Stony Mountain, Man.; if at any future time protection be required at crossing, applicant company to provide same.

22306. July 29.—Authorizing G. T. Pacific Saskatchewan Ry. to operate over crossings of C. P. R. at Weyburn, Sask., until Oct. 15, pending installation of interlocking plant, crossings to be protected by flagmen appointed by C. P. R., at expense of G. T. P. S. R.

22307. July 27.—Ordering Campbellford, Lake Ontario and Western Ry. (C. P. R.) within 60 days to install improved type of automatic bell at crossing of Frontenac Road, Parham, Ont.

22308. July 29.—Authorizing Michigan Central Rd. to build spur for Union Carbide Co. of Canada, Ltd., Crowland Tp., Ont.

22309. July 29.—Authorizing Alberta Central Ry. to open for traffic its line west of Red Deer, mileage 0 to 64.5.

22310. July 31.—Authorizing Union Bank of Canada to repay to S. A. Hamilton Co., Moose Jaw, Sask., $1 100 deposited to Board's credit, with accrued interest, if any.

22311. July 29.—Authorizing Saskatchewan Highway Commissioners to build a highway over G.T. Pacific Branch Lines Co.'s Regina Boundary Branch, on extension of Queen St., Colfax.

22312. July 31.—Authorizing G.T. Pacific Ry. to build extension to bridge over Fraser River, mileage 468.4, Prince Rupert East, B.C.

22313. July 30.—Authorizing Canadian Northern Ry. to build to revised line across C.P.R. in s.w. ¼ Sec. 19-40-26, near Lacombe, Alta.

22314. July 29.—Authorizing Canadian Northern Ry. to operate for construction purposes only, for 60 days from date, pending installation of interlocking plant over crossing of C.P.R. in Lot 101, St. Paul Parish, Man., trains to be flagged over by watchmen appointed by C.P.R. at expense of C.N.R.

22315. Aug. 4.—Extending express collection and delivery limits in Windsor, Ont., and rescinding order 19533, June 9, 1913.

22316. Aug. 1.—Ordering G.T. Pacific Ry. to build station, not to be below standard 1 B.R.C., and a one pen stockyard at Ribstone, Alta.; to be completed by Sept. 15, and company to stop trains 1 and 2 on flag there for passengers and express.

22317. July 24.—Ordering G.T.R. to build spur for Standard Crushed Stone Co., near Windmill Point station, Ont.

22318. Aug. 1.—Extending to Oct. 31, time within which G.T.R. shall complete subway at Thompson Road, Bertie Tp., Ont.

22319. July 30.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate across C.N. Ontario Ry. in Lot 27, Con. 2, Pickering Tp., until Sept. 15, pending installation of interlocking plant; crossing to be protected by flagmen appointed by C.N.O.R. at expense of C.L.O. & W.R.

22320. Aug. 1.—Authorizing C.P.R. to build road diversion in Sec. 34, Tp. 5, and Sec. 3-6-24, w. 3 m.; and build its Weyburn-Stirling Branch east and west road allowance at mileage 272.7.

22321. Aug. 1.—Authorizing C.P.R. to build its Weyburn-Stirling Branch Line across 12 highways, between mileage 65 and 75 from Stirling, Alta.

22322. July 30.—Rescinding order 21977, May 20, re siding for Dodge Mfg. Co., Toronto.

22323. Aug. 1.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate until Oct. 31 over crossing of Toronto Eastern Ry. at junction of Scugog and Wellington Sts., Bowmanville, Ont., mileage 149.2 from Glen Tay, crossing to be protected by watchmen appointed by Toronto Eastern Ry. at expense of C.L.O. & W.R.

22324. Aug. 1.—Authorizing city of Vancouver, B.C., to build highway crossing over C.P.R. at Commercial Drive.

22325. Aug. 1.—Authorizing Glengarry and Stormont Ry. to build across G.T.R., at grade, near Cornwall, Ont., G. & S.R. to pay cost interlocking plant.

22326. Aug. 1.—Authorizing C.P.R. to rebuild bridge 22.28, Gibson Subdivision, near Hainesville, N.B.

22327. Aug. 7.—Dismissing G.T.R. application to require Hamilton and Toronto Sewer Pipe Co. to replace siding to its premises and those of Fowler's Canadian Co.

22328. Aug. 4.—Authorizing G.T.R. to build branch to Hospital for Feeble Minded, South Orillia Tp., Ont., to be completed within three months.

22329. Aug. 7.—Authorizing C.P.R. to build branch for Seaman, Kent Co., Montreal, within three months.

22330. Aug. 7.—Authorizing C.P.R. to build spur for John Deere Plow Co., Regina, Sask., within three months.

22331. Aug. 7.—Approving C.P.R. plan B-I-1371 showing details of structure at crossing of Esquimalt and Nanaimo Ry. over C.N. Pacific Ry. at mileage 5.3.

22332. Aug. 5.—Authorizing C.P.R. to build across Marion St., St. Boniface, Man.

22333. Aug. 5.—Authorizing C.P.R. to open for traffic portions of its double track on the Shuswap and Thompson Subdivisions, mileage 1.4 to 1.6, B.C.

22334. Aug. 4.—Authorizing C.P.R. to build spurs for Imperial Oil Co., Sarnia, Ont., at Camrose, Alta., within three months.

22335. Aug. 5.—Authorizing C.P.R. to open for traffic portions of its double track of the Thompson Subdivision from mileage 1.1 to 1.15, and 6.3 to mileage 7.7, B.C.

22336. Aug. 6.—Ordering Canadian Northern Ry. to fence its right of way in s.e. ¼ Sec. 21-7-25, w. 4 m., Alta., by May 1, 1915.

22337. Aug. 5.—Approving Canadian Northern Ry. Standard Freight Tariff, C.R.C. no. W. 793, between stations in Ontario west of and including Port Arthur, and in Manitoba, Saskatchewan and Alberta.

22338. Aug. 6.—Relieving C.P.R. from speed limitation of 10 miles an hour over crossing at mileage 0.91 from St. Martins Jct., Que.

22339. Aug. 5.—Ordering that compensation be made to C.P.R. for its property actually required for subway, and consequential damages resulting from its construction on York St., Toronto, re viaduct order 7200, June 9, 1909, amount to be paid by City of Toronto.

22340. Aug. 7.—Approving revision in main line of Algoma Central and Hudson Bay Ry. in Sec. 37, Vankoughnet Tp., and Lot 12, Con. 1, Deroche Tp., Ont., and authorizing it to build bridge at mileage 19 north of Sault Ste. Marie.

22341, 22342. Aug. 4.—Authorizing Winnipeg Electric Ry. to cross C.P.R. at two points on Notre Dame Ave., Winnipeg.

22343. Aug. 5.—Authorizing the C.N. Ontario Ry. to build temporary grade on its Montreal-Hawkesbury Line from mileage 46.69 to 48.62 for construction purposes only, for a further two months from Sept. 29.

22344. Aug. 5.—Authorizing G.T.R. to build highway crossing between Cons. 2 and 3, Tay Tp., Ont., within two months.

22345. Aug. 5.—Authorizing the C.N. Ontario Ry. to build transfer track with C.P.R. in Smiths Falls, Ont.

22346. July 21.—Authorizing New York Central Rd. to stop certain trains at Adirondack Jct.

22347. Aug. 6.—Relieving G.T.R. from speed limitation of 10 miles an hour at crossing of first public highway west of South Indian station, Ont.

22348. Aug. 8.—Authorizing C.P.R. to build road diversion in Sec. 1-23-2, w. 4 m., Alberta, and to build ballast pit spur across same at mileage 111.68, Bassano Easterly Branch, at grade.

22349. Aug. 4.—Approving revision and location of C.P.R. from mileage 108.4 to 117.9, Calgary Subdivision; also as built between mileage 96.93 and 124.94; and authorizing it to build additional track across highways in Alberta.

22350. Aug. 6.—Authorizing G.T.R. to build sidings for Union Stock Yards, Toronto.

22351. Aug. 6.—Authorizing C.P.R. to build bridge 24.2 over Otonabee River, Peterborough, Ont.

22352. Aug. 6.—Authorizing C.P.R. to build siding across Elliott St., Windsor, Ont.

22353. Aug. 6.—Authorizing C.P.R. to build temporary sidings for C. E. Deakin, Ltd., Montreal.

22354. Aug. 6.—Authorizing C.P.R. to build siding for Geo. Lawrence, Westboro, Ont.

22355. Aug. 8.—Approving of plans 60 and 61, July 22, 1914, of Union Station, Toronto.

22356. Aug. 6.—Dismissal of application of Rocmac Road Corporation of America, for reduction in Canadian Freight Classification from 7th class to 10th class.

The Military Concentration Camp at Valcartier.

On the outbreak of war the Canadian Militia Department, in anticipation of the acceptance by the mother country of the offer of Canadian troops for service abroad, proceeded to lay out a concentration camp at Valcartier, Que., 16.2 miles from Quebec, on the Quebec and Lake St. John Ry., now part of the Canadian Northern Ry. system, where the troops might be placed in condition to be effective in assisting the British arms. To handle the large contingent promised by this country special railway facilities were required in a great hurry, and the railway officials proceeded immediately to put in such railway accommodation as would meet the requirements. The accompanying plan shows the railway facilities provided, the solid lines showing the existing tracks, and the dotted lines the trackage laid for military purposes. Three miles of track were laid in a week.

At Valcartier station the old Gosford branch of the Q. and L. St. J. Ry. leaves the main line. The site selected is in the area bounded by this line on the west, and by the main line on the south. As the main railway connection to the camp, a line 8,800 ft. long was laid from mileage 15.05 to a point on the Gosford branch, and a little west of midway in this line, three sidings were laid as the main transfer point, one of these sidings being double ended, the other two entering only from the west. Several additional sidings are being laid. A 12 degree loop from the west end of the sidings is connected back into the Gosford line in the return direction, so that the traffic may make a return loop back to Quebec, providing an effective means of giving an uninterrupted service in the immediate vicinity of the camp. On this siding the Militia Department has erected three commissariat buildings, each 48 ft. wide, two 300 ft. long, and the third 200 ft. long.

To the west of these three sidings another blind siding has been laid, on which the Militia Department has erected an ordnance building, 48 by 200 ft. A double ended siding has also been laid near the east end of the military cut off, where an unloading platform has been erected. Beyond the west end of the cut off a double ended siding has been laid, with two branching blind sidings, to be used for official cars. The camp station is located at mileage 15, near the east end of the cut off.

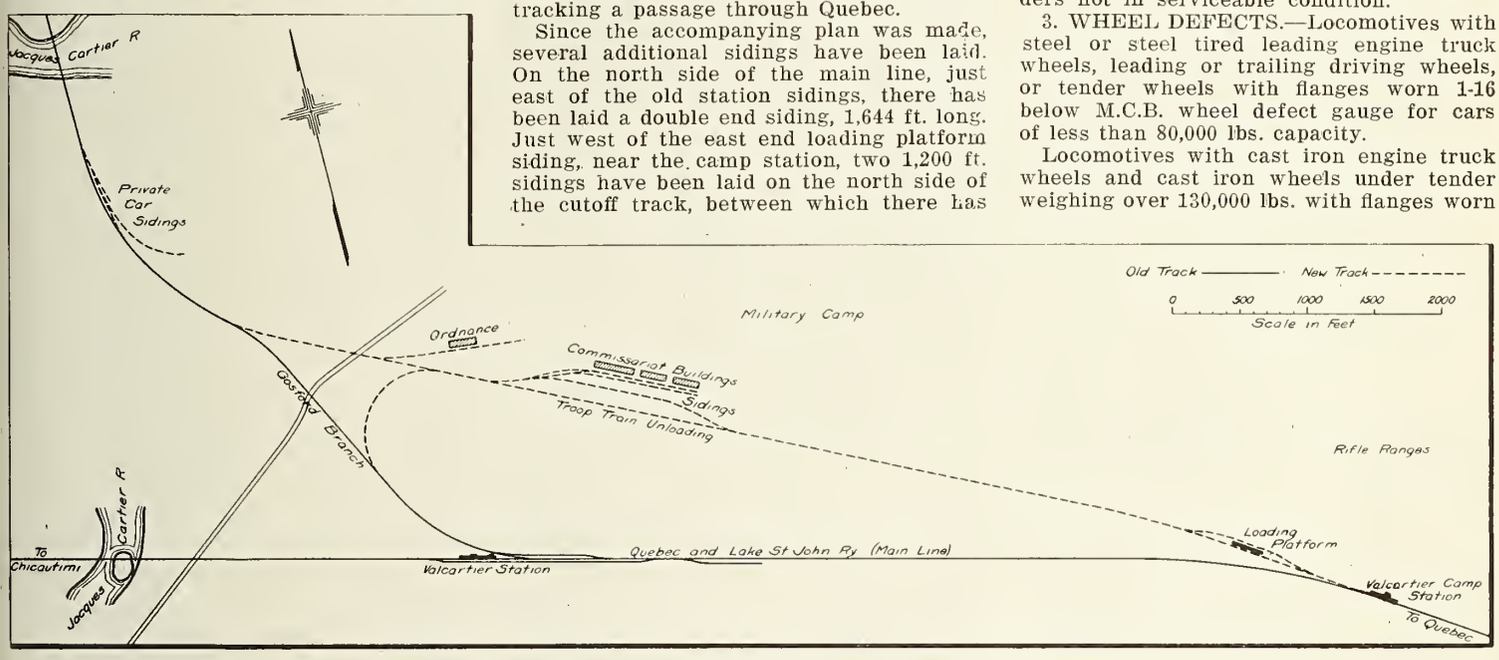
At this point the railway is particularly well supplied with siding accommodation for holding trains in readiness. The Gosford branch at the west end has no passenger service, so that it may be used as a long siding if required, and in the meantime there is a large amount of siding provided some distance along this line at a large lumber mill, the sidings for which will be utilized. This accommodation is in addition to the three sidings at Valcartier station.

For the handling of troops from points west of Quebec the Q. and L. St. J. Ry. has a good connection a short distance outside Quebec city. Both the Canadian Northern Quebec Ry. and the Q. and L. St. J. Ry. run into Quebec from the north over tracks that parallel each other for some distance near the city. A switch at the point where these lines meet transfers the traffic from the C.N.R. to the line to the camp, sidetracking a passage through Quebec.

Since the accompanying plan was made, several additional sidings have been laid. On the north side of the main line, just east of the old station sidings, there has been laid a double end siding, 1,644 ft. long. Just west of the east end loading platform siding, near the camp station, two 1,200 ft. sidings have been laid on the north side of the cutoff track, between which there has been built a loading platform 380 ft. long, and at the stub ends of the sidings there are 40 ft. end loading ramps. At the west end of the cutoff an additional siding has been laid paralleling the ordnance siding, and at the stub end of the older siding a further building, 300 by 36 ft., has been built by the Militia Department. On the north side of the commissariat siding, between the switch and the buildings, an additional unloading platform, 320 ft. long, has been built. Additions have also been made to the private car sidings.

The engineering work was done by C. H N. Connell, Engineer of Maintenance of way, C.N.R., and all the railway arrangements in connection with the camp are in charge of F. M. Spaidal, General Superintendent, Quebec Grand Division, assisted by W. A. Kingsland, Auditor.

The C.N.R. has carried a large number of troops from Toronto and other points west of Quebec to Valcartier, and on Aug. 24 started a direct passenger service leaving Toronto daily, except Sunday, at 9.20 a.m., via Ottawa, Joliette and Shawinigan Jct., arriving at Valcartier the following morning at 10.23. Westbound trains leave Valcartier at 4.41 p.m., reaching Toronto the next day at 9.15 p.m.



Railway Connections for the Valcartier Military Concentration Camp.

Order re Locomotive Defects.

The Board of Railway Commissioners has issued general order 131 under date of July 6, as follows:—

Re locomotive defects, and circular 127, Feb. 24, submitted by direction of the Board to railway companies for their consideration, upon reading replies to the circular, filed by the railway companies, and the reports of the Board's operating officers, the railway companies, after various meetings and discussions, consenting to the adoption of the regulations particularly set out in this order, it is ordered that locomotives be not allowed to leave terminals, or be used at terminals, in traffic service, on which any of the following defects exist, namely:—

1. STEAM LEAKS from any part of the locomotive which render it impossible for engineer to see signals in sufficient time to enable him to bring his train to a stop within the required distance.

2. AIR BRAKES on locomotives or tenders not in serviceable condition.

3. WHEEL DEFECTS.—Locomotives with steel or steel tired leading engine truck wheels, leading or trailing driving wheels, or tender wheels with flanges worn 1-16 below M.C.B. wheel defect gauge for cars of less than 80,000 lbs. capacity.

Locomotives with cast iron engine truck wheels and cast iron wheels under tender weighing over 130,000 lbs. with flanges worn 1-16 below M.C.B. defect gauge for cars of 80,000 lbs. capacity, or over.

Locomotives with cast iron wheels under tender weighing 130,000 lbs. or less, with flanges worn 1-16 below M.C.B. defect gauge for cars of less than 80,000 lbs. capacity.

Locomotives with truck or tender wheels having shelled out or flat spots over 2½ ins. long, or so numerous as to endanger the safety of the wheel.

Steel tires on locomotives worn hollow ⅜ in. in depth, or which are worn below safe limit of thickness. Railway companies to file with the Board their standard limit of thickness of tires on all classes of locomotives, for approval.

Flat or shelled out spots on locomotive driving wheels 3 ins. long.

4. SPRINGS.—Locomotives with defective springs on any part of locomotive or tender which are unable to carry their respective weights when locomotive is standing.

And it is further ordered that the railway companies be required, on or before Jan. 1, 1915, to equip their locomotives with double windows in the front of the cabs during the winter, Nov. 1 to April 30, the same to be made airtight.

Canadian Pacific Railway Company's Annual Report.

Following are extracts from the 33rd annual report issued to shareholders, over the signature of the President, Sir Thos. G. Shaughnessy:—

The accounts for the year ended June 30, show the following results:

Gross earnings		$129,814,823.83
Working expenses		87,388,896.15
Net earnings		$ 42,425,927.68
Deduct fixed charges		10,227,311.17
Surplus		$ 32,198,616.51
Contribution to pension fund		125,000.00
		$ 32,073,616.51
Deduct net earnings of Pacific Coast steamships, commercial telegraph, and news department, transferred to special income Account		2,115,842.15
		$ 29,957,774.36
From this there has been charged a half yearly dividend on preference stock of 2%, paid Apr. 1	$ 1,545,026.80	
And three quarterly dividends on ordinary stock of 1¾% each, paid Jan. 2, Apr. 1 and June 30	12,600,000.00	14,145,026.80
		$15,812,747.56
From this there has been declared a second half yearly dividend on preference stock, payable Oct. 1	$1,564,493.46	
And a fourth quarterly dividend on ordinary stock of 1¾%, payable Oct. 1	4,550,000.00	6,114,493.46
Leaving net surplus for the year		$ 9,698,254.10

In addition to the above dividends on ordinary stock, 3% was paid from special income.

DETAILS OF SPECIAL INCOME FOR YEAR.

Balance at June 30, 1913	$3,358,941.93	
Less dividend paid Oct. 1, 1913	1,500,000.00	$1,858,941.93
Interest on proceeds land sales to Oct. 31, 1913		492,136.05
Interest on deposits and loans		1,139,461.48
Interest from M., St. P. & S.S.M.R. bonds		159,720.00
Interest from Mineral Range Ry. bonds		50,160.00
Interest from T.H. & B. Ry. bonds.		10,840.00
Interest from Dominion Government bonds for half year		91,250.00
Interest from Ontario Government bonds for half year		24,000.00
Interest from British consols for half year		57,284.72
Interest from Montreal & Atlantic Ry. bonds, and on other securities		348,472.18
Interest from Berlin, Waterloo, Wellesley & Lake Huron Ry. bonds		17,040.00
Interest from St. John Bridge & Ry. Extension Co. bonds		5,437.50
Interest from Esquimalt & Nanaimo Ry. bonds		193,280.00
Interest from Dominion Atlantic Ry. Extension debenture stock		50,068.27
Interest from Dominion Atlantic Ry. 2nd debenture stock		36,986.67
Dividend on Esquimalt & Nanaimo Ry. stock		125,000.00
Dividend on St. John Bridge & Ry. Extension Co. stock		70,000.00
Dividends on Dominion Express Co. stock		200,000.00
Dividends on M., St. P. & S.S.M.R. common stock		890,645.00
Dividends on M., St. P. & S.S.M.R. preferred stock		445,326.00
Dividends on West Kootenay Power & Light Co. common stock		52,250.00
Dividends on West Kootenay Power & Light Co. preferred stock		3,850.00
Dividends on T.H. & B.R. stock		57,012.00
Dividends on Consolidated Mining & Smelting Co. stock		140,912.00
Dividend on Berlin, Waterloo, Wellesley & Lake Huron Ry. stock		12,500.00
Earnings from ocean steamships		783,677.93
Revenue from company's interest in coal mine properties		294,857.17
Cash proceeds from townsites sales		550,303.49
Net earnings of Pacific Coast steamships, commercial telegraph, news department and hotels		2,134,255.21
Received for space rented in office buildings		151,144.86
		$10,446,812.46
Less—Payments to shareholders in dividends: Jan. 2, Apr. 1 and June 30	5,400,000.00	
		$ 5,046,812.46
From this a dividend has been declared, payable Oct. 1		1,950,000.00

The working expenses were 67.32% of the gross earnings, and the net earnings 32.68% compared with 66.82 and 33.18% respectively in 1913.

Four per cent. consolidated debenture stock to the amount of £2,065,119 was created and sold, and of the proceeds £239,000 was applied to the construction of authorized branch lines, and £1,826,119 was devoted to the acquisition of securities of other railway companies whose lines constitute a portion of your system, the interest on which had, with your sanction, been guaranteed by your company.

Four per cent. preference stock to the amount of £800,000 was created and sold for the purpose of meeting capital expenditures previously sanctioned by you.

Your guarantee of interest was endorsed on the 4% consolidated Bonds of the M., St. P. and S. S. M. Ry. Co., to the amount of $1,947,000 issued and sold to cover cost of 97.35 miles of railway added to that company's system.

During the year 259,371 acres of agricultural land were sold for $4,618,420, an average of $17.80 an acre. Included in this area there were 6,318 acres of irrigated land which brought $66.93 an acre, so that the average price of the balance was $16.57 an acre.

To give effect to an agreement with the City of Toronto, and an order of the Board of Railway Commissioners requiring the railway companies to provide a union passenger station and joint terminals commensurate with the passenger traffic of the city, and to eliminate grade crossings by the elevation of their tracks in the joint terminals on the water front, the Toronto Terminals Ry. Co. has been organized with the sanction of Parliament, and a contract has been made between your company, the G. T. R., and the Toronto Terminals Ry. Co., for the construction and operation of the union passenger station and terminals, which fixes the rental to be paid by each company for the use of the facilities at 5% per annum on half the amount of the T. T. Ry. Co. securities outstanding at any time, provides for the joint and several guarantee by your company and the G. T. R. of the payment both as to principal and interest of the said securities, and establishes the basis on which the expense of operating the station and terminals shall be divided between the companies. The Dominion Government and the City of Toronto will participate in the expense of carrying out these works on a basis to be determined by agreement between the parties, or to be settled by the Board of Railway Commissioners, but it is estimated that the portion of the cost to be borne by the T. T. R. Co. will be approximately $12,000,000. The contract will be submitted for your consideration and approval.

An agreement has been reached between the Kettle Valley Ry. Co. and the Vancouver, Victoria and Eastern Ry. and Nav. Co., covering the use, by the latter company for its trains, of the K. V. R. between Otter Summit and Hope, about 54 miles, and for the like use by the K. V. R. of the V., V. & E. R. between Princeton and Otter Summit, about 38 miles, all in British Columbia. In each case the lessee undertakes to pay a rental equal to 2½% per annum on the cost of the other company's line used in common, and its proportion of the cost of maintenance. By this means the unnecessary duplication of 92 miles of railway through a difficult country is avoided. Inasmuch as the K. V. R. has been leased to your company, your consent is required to make the arrangement effective, and, therefore, the agreement will be submitted for your sanction.

A lease for 999 years of the Lake Erie and Northern Ry., extending from Port Dover on Lake Erie through Simcoe, Waterford, Brantford, and Paris, in Ontario, to a connection with your railway at Galt, approximately 51 miles, at an annual rental equivalent to the interest on bonds issued or to be issued by the L. E. & N. R. with the consent of your company, will be submitted for your approval. This line will provide access to territory that is not now served by your railway, and will at a later stage be equipped for operation by electricity, in connection with your Galt, Berlin and Waterloo branch.

There will be submitted for your consideration and approval a lease of the Southampton Ry. from the Gibson Branch of this company's railway between Millville station and the railway bridge crossing the northeast Nackawick stream to the vicinity of the Pokiok bridge in York County, N. B., approximately 13 miles, for 99 years, on the basis of a rental of 40% of the gross earnings as defined in the said proposed lease; a lease of that portion of the Fredericton and Grand Lake Coal and Ry. from the Intercolonial Ry. at or near Gibson, in York County, to Minto, Sunbury County, to connect with the present line of the New Brunswick Coal and Ry., approximately 31 miles, for 999 years, on the basis of a rental of 40% of the gross earnings as defined in the said proposed lease; and a lease from the Glengarry and Stormont Ry. Co. of the whole of the railway which that company has been authorized to construct, whether constructed or to be constructed, from a point on this company's railway at St. Polycarpe Jct., Soulanges County, Que., to Cornwall, Stormont County, in Ontario, approximately 27 miles, together with the appurtenances of the said railway, for 99 years from the date of completion, on the basis of a rental of 40% of the gross earnings and other terms more fully set out in the said proposed lease.

The capital expenditure of over $60,000,000 for cars and locomotives in the years 1910-1913 was so very large that your directors decided it would be proper to spread the payments for this year's deliveries, about $14,000,000, over 15 years, under the terms of an ordinary equipment trust agreement, and, therefore, a contract was made with the Victoria Rolling Stock and Realty Co. to provide the equipment and receive payment in 15 annual instalments, with interest at 4½% per annum. All of the equipment has been delivered, and the cost has been advanced by your company pending the sale of the Rolling Stock Co.'s bonds, when your treasury will be recouped.

The accounts for the year show that $35,571,959.97 had been advanced from your current funds to meet the cost of additional railway mileage and ocean steamers against which no securities have been issued or sold. In ordinary course, 4% consolidated debenture stock would have been utilized to meet this expenditure, but market condi-

tions were not favorable to the sale of this security in large amounts without unduly depressing the market price.

In these circumstances your directors decided to create a special investment fund composed of the deferred payments on land sold, and securities in which land funds had been invested, to the amount of $55,000,000, and to issue against this fund and the company's credit 10 year note certificates to the amount of $52,000,000, carrying interest at the rate of 6% per annum, to be offered to the shareholders at 80% of their face value, thus providing all the money required for the present purposes of the company, and at the same time giving the shareholders participation in the proceeds of land sales to the amount of about $10,000,000.

The issue was entirely successful. The note certificates, with interest, will be paid off in instalments without any encroachment on your revenue from traffic, and the 4% consolidated debenture stock can be marketed in such amounts and at such times as may be most advantageous.

Since the close of the last fiscal year first mortgage 5% bonds to the amount of only £64,700 or $314,873.33 have been taken up and cancelled, because the holders were unwilling to surrender their bonds at a premium satisfactory to your directors. The outstanding bonds, amounting to £2,638,900 or $12,842,646.67, will mature July 1, 1915, and on or before that date they will be paid off and cancelled with funds set aside for the purpose.

As mentioned in the notice to shareholders, the annual general meeting will be made special for the purpose of authorizing, if approved, an increase of the company's ordinary capital stock by the amount of $75,000,000, namely, from $260,000,000 to $335,000,000, in order to make it accord with the amount for which the company has the sanction of the government. Although with the curtailment of capital expenditure no necessity exists for issuing any additional ordinary stock at this time, and there will be no resumption of works requiring any large amount of money until a decided improvement in business conditions furnishes ample warrant, your directors are convinced of the prudence of making provision at this time for your capital requirements covering a considerable period in the future. No portion of this increased amount will, of course, be issued by the directors until the sanction of the shareholders has been obtained at a special general meeting called for the purpose.

The death in January last of the Right Hon. Lord Strathcona and Mount Royal, G.C.M.G., was a source of sincere sorrow to your directors. Lord Strathcona was one of the prominent founders of the company, and he remained a member of the board of directors until the time of his death.

Your directors report with regret the death, in April, of Sir William Whyte who had occupied a position of importance in the company's affairs for many years. As Vice President in charge of the company's interests west of Lake Superior he proved himself a most capable and useful officer, and on his retirement from active service in 1911 he became a member of the board of directors.

A. M. Nanton of Winnipeg has been elected a director in place of the late Sir William Whyte. The vacancy caused by the death of Lord Strathcona has not as yet been filled.

As foreshadowed at the last annual meeting, the general balance sheet has been recast so as to show in more specific form the active and inactive assets of the company. In the schedule of these assets which appears in the annual report the estimated value per acre of the unsold agricultural lands has been placed at lower figures than had been mentioned, in order that it might be quite on the safe side, but your directors and the officers of the Land Department are satisfied that your unsold lands will eventually command much higher average prices per acre than those given in the schedule.

The values fixed for the townsites and other lands and properties available for sale are on a conservative basis, and the active assets taken into the schedule at cost could be readily disposed of at figures very much higher than those given.

Some years ago, for the purpose of securing access to the State of Washington and other important territory in the north western United States, the company entered into a working arrangement with the Spokane International Ry. Co., extending from Kingsgate, on the line of your railway in British Columbia, to Spokane, Wash., 141 miles, with branch lines 22 miles in length. The volume of traffic secured to your lines by this connection has become so important that a more permanent arrangement is very desirable. Your directors have not yet decided whether this could be best accomplished by the acquisition of the capital stock of the Spokane International Ry. Co., by a guarantee of interest on its bonds, or by some other means, and therefore they will ask your authority to exercise their decision in carrying out such a transaction for closer and more permanent relations with the Spokane International Ry. Co. as may appear to be most desirable in your interest.

The net revenue of the commercial telegraph system, Pacific Coast steamers, and news department, that in previous years had been incorporated in the revenue of the railway, is deducted from the surplus shown in the revenue statement this year and transferred to special income account.

CONDENSED BALANCE SHEET.

ASSETS.

Railway	$338,084,064.89	
Rolling stock equipment	153,256,394.79	
Ocean, lake, and river steamships	24,171,162.30	
		$515,511,621.98
Acquired securities (cost)		107,867,740.63
Advances to lines and steamships under construction		35,571,959.97
Advances and investments		12,330,195.22
Deferred payments on lands and townsite sales		4,140,413.83
*Special investment fund:		
Deferred payments on land and townsites	$42,666,510.87	
Government securities	10,088,734.86	
Deposited with trustee	3,790,225.53	
		56,545,471.26
Working Assets:		
Material and supplies on hand	$17,686,235.53	
Agents and conductors balances	3,221,350.07	
Net traffic balances	533,996.70	
Miscellaneous accounts receivable	10,511,665.82	
Cash in hand	36,777,725.02	
		68,730,973.14
Other assets		133,022,494.74
		$933,720,870.77

*Security for issue of note certificates, $52,000,000.

LIABILITIES.

Capital stock:		
Ordinary stock	$260,000,000.00	
4% preference stock	78,224,673.03	
		$338,224,673.03
4% consolidated debenture stock		173,307,470.09
Mortgage Bonds:		
C.P.R. 1st mortgage 5%	$12,842,646.67	
Algoma Branch 1st mortgage 5%	3,650,000.00	
		16,492,646.67
Note certificates 6%		52,000,000.00
Premium on ordinary capital stock sold		45,000,000.00
Audited vouchers	$7,809,598.58	
Pay rolls	5,177,754.16	
Miscellaneous accounts payable	9,048,037.42	
		22,035,390.16
Coupons due July 1, and including coupons overdue not presented	$757,204.67	
Rentals of leased lines	189,810.72	
		947,015.39
Equipment obligations	14,350,000.00	
Less Victoria Rolling Stock and Realty Co. bonds on hand	13,630,000.00	
		720,000.00
Reserves and appropriations:		
Equipment replacement	2,491,518.64	
Steamship replacement	6,682,068.87	
Reserve fund for contingencies	2,083,942.12	
		11,257,529.63
Net proceeds lands and townsites		66,771,271.19
Surplus revenue from operation		79,711,091.66
Surplus in other assets		127,253,782.95
		$933,720,870.77

FIXED CHARGES FOR YEAR.

1st mortgage bonds 5% due July 1, 1915	$ 642,862.30
St. Lawrence & Ottawa Ry. 4% first mortgage bonds	38,933.34
Man. S. West. Colzn. Ry. 1st mortgage 5% bonds due June 1, 1934.	127,200.00
Ontario & Quebec Ry. debenture stock, 5%	975,129.56
Ontario & Quebec Ry. ordinary stock, 6%	120,000.00
Atlantic & North West. Ry. 1st mortgage bonds due Jan. 1, 1937.	323,633.34
Algoma Branch 5% 1st mortgage bonds, due July 1, 1937	182,500.00
New Brunswick Southern Ry. 1st mortgage bonds, 3%	15,000.00
Lindsay, Bobcaygeon & Pontypool Ry. 1st mortgage bonds, 4%	20,000.00
Shuswap & Okanagan Ry. 1st mortgage bonds, 4%	49,990.40
Rental, Toronto, Grey & Bruce Ry.	140,000.00
Rental, Calgary & Edmonton Ry.	218,357.60
Rental, Farnham to Brigham Jct.	1,400.00
Rental, Mattawamkeag to Vanceboro	23,800.00
Rental, New Brunswick Ry. system	372,829.74
Rental, Terminals at Toronto	23,221.29
Rental, Terminals at Hamilton	37,258.21
Rental, Hamilton Jct. to Toronto.	42,191.12
Rental, St. Stephen and Milltown Ry.	2,050.00
Rental, Joliette & Brandon Ry.	5,000.00
Rental, Lachine Canal Branch	939.96
Interest on Montreal & Western Ry.	14,027.75
Interest on equipment obligations.	45,466.67
4% consolidated debenture stock:	
Interest from July 1, 1913 $6,694,741.04	
Interest from Jan. 1, 1914 118,778.85	
$6,813,519.89	
Less received from subsidy Northern Colonization Ry. 8,000.00	
	6,805,519.89
	$10,227,311.17

EXPENDITURE ON ADDITIONS AND IMPROVEMENTS.

Eastern Lines:		
Additional sidings, buildings, stations and yards	$ 664,882.11	
Permanent bridges and improvements of line	1,164,100.35	
Double tracking	4,045,223.88	
Right of way	7,127.46	
		$5,881,333.80
Montreal Terminals.		890,847.90
Windsor St. station extension		391,771.73
Double track bridge over St. Lawrence River		128,923.90
Western Lines:		
Additional sidings, buildings, stations and yards	$1,329,064.58	
Permanent bridges and improvements of line	548,176.83	

Fort William Terminals, including coaling plant	1,007,816.09	
East Winnipeg yard	1,456,849.78	
Winnipeg new elevator	203,178.78	
Winnipeg station and hotel	1,255,926.24	
Calgary hotel	1,289,923.92	
Vancouver terminals	1,760,041.33	
Double tracking	7,549,677.45	
Right of way	8,993.04	
		16,409,648.01
Additions to office buildings and hotels.		1,776,268.64
Rented and temporary sidings		317,075.47
Telegraph extensions and additions		95,403.36
		$25,891,272.84

EXPENDITURE ON LEASED AND ACQUIRED LINES.

New Brunswick Ry.	$ 813,551.59
Atlantic & North West Ry.	551,289.15
Montreal & Ottawa Ry.	51,458.51
Montreal & Western Ry.	48,666.80
Ontario & Quebec Ry.	2,933,370.03
Manitoba & North Western Ry.	98,016.17
Manitoba South Western Colonization Ry.	41,704.10
Calgary & Edmonton Ry.	294,770.89
Columbia & Kootenay Ry.	3,540.64
Columbia & Western Ry.	188,509.24
New Brunswick Southern Ry.	11,106.12
Cap de la Madeleine Ry.	3,811.94
St. Maurice Valley Ry.	30,800.56
Joliette & Brandon Ry.	3,316.91
Ottawa, Northern & Western Ry.	28,990.47
Lindsay, Bobcaygeon & Pontypool Ry.	2,952.57
Georgian Bay & Seaboard Ry.	63,989.90
Guelph & Goderich Ry.	41,393.40
Tillsonburg, Lake Erie & Pacific Ry.	25,045.32
Walkerton & Lucknow Ry.	12,885.13
Great North West Central Rv.	7.75
Nicola, Kamloops & Similkameen Ry.	6,848.01
Kaslo & Slocan Ry.	225,796.37
	$5,481,821.57

Less sale of steamship Joan	60,000.00		
	$153,537.57		
Less amount paid from steamship replacement	14,846.94		
		$138,690.63	
Additional river steamers and barges	$263,295.07		
Less sale of tug Cruizer	40,000.00		
		223,295.07	
Payments of balance on account of steamships Empress of Asia and Empress of Russia	639,482.73		
Less amount paid from steamship replacement	340,567.49		
		298,915.24	
Purchase of steamship St. George		460,978.15	
			1,121,879.09
1st mortgage 5% bonds redeemed at 102	314,873.33		321,170.79
Deposited with trustee of special investment fund			3,790,225.53
Securities acquired:			
Campbellford, Lake Ontario & Western Ry. 1st mortgage bonds		$6,590,000.00	
St. John Bridge & Ry. Extension Co. bonds		124,000.00	
Alberta Ry. & Irrigation Co. stock		4,500.00	
Dominion Atlantic Ry. Extension debenture stock		1,423,500.00	
Public Markets Limited stock		35,000.00	
Shuswap & Okanagan Ry. stock		300.00	
Consolidated Mining & Smelting Co. stock		511,234.86	
			8,688,534.86
Payment of equipment obligations			160,000.00
Amounts transferred from advances and investments to other assets			2,780,406.88
			$97,012,393.23
Deduct decrease in material and supplies on hand			941,971.46
			$96,070,421.77
Add decrease in liabilities:			
Current liabilities		$22,035,390.16	
Interest on funded debt		947,015.39	
Reserves and appropriations		11,257,529.63	
		$34,239,935.18	
Amount at June 30, 1913		42,959,331.63	
			8,719,396.45
			$104,789,818.22
Cash on hand			36,777,725.02
			$141,567,543.24

RECEIPTS AND EXPENDITURES.

Cash in hand June 30, 1913			$30,274,848.30
Amount invested in Government securities $10,088,734.86 transferred to security for issue of note certificates.			
RECEIPTS:			
Surplus revenue		$29,957,774.36	
Special income		8,587,870.53	
			38,545,644.89
Land department:			
Lands and townsites:			
Net proceeds of sales		7,246,214.99	
Less irrigation expenditures		3,809,228.99	
		$3,436,986.00	
Deferred payments on previous years' sales		4,123,729.12	
		$7,560,715.12	
Less amount remaining in deferred payments on year's sales		6,431,538.04	
			1,129,177.08
Moose Jaw N. W. Branch subsidy			218,682.27
Capital stock:			
Remaining instalments on $60,000,000 ordinary stock at $175			41,548,332.50
4% preference stock:			
Amount realized from issue £800,000			3,648,598.80
Consolidated debenture stock:			
Amount realized from issue £2,065,119			9,695,125.60
Note certificates 6%:			
Amount realized from issue $52,000,000			41,600,000.00
			$166,660,409.44
Deduct:			
Agents and conductors' balances	$ 3,221,350.07		
Net traffic balances	533,996.70		
Miscellaneous accounts receivable	10,511,665.82		
		$14,267,012.59	
Advances to lines and steamships under construction		35,571,959.97	
Advances and investments		12,330,195.22	
		$62,169,167.78	
Amount at June 30, 1913		37,076,301.58	
			25,092,866.20
			$141,567,543.24
EXPENDITURES:			
Dividends on preference stock:			
2% paid Oct. 1, 1913		$1,486,626.79	
2% paid Apr. 1, 1914		1,545,026.80	
			3,031,653.59
Dividends on ordinary stock:			
2½% paid Oct. 1, 1913		5,000,000.00	
2½% paid Jan. 2, 1914		5,000,000.00	
2½% paid Apr. 1, 1914		6,500,000.00	
2½% paid June 30, 1914		6,500,000.00	
			23,000,000.00
Construction of branch lines			1,563,086.14
Additions and improvements, main line and branches			25,891,272.84
Additions and improvements, leased and acquired lines			5,481,821.57
Rolling stock equipment			19,855,512.54
Shops and machinery			1,326,829.40
Ocean, lake, and river steamers:			
Additional steamships and appurtenances for Pacific Coast service	$213,537.57		

STATEMENT OF EARNINGS AND EXPENSES FOR THE YEAR.

EARNINGS:		
From passengers	$ 32,478,146.58	
From freight	81,135,295.12	
From mails	1,132,714.91	
From sleeping cars, express, telegraph and miscellaneous	15,068,667.22	
Total		$129,814,823.83
EXPENSES:		
Transportation expenses	$ 42,250,286.37	
Maintenance of way and structures	16,426,582.05	
Maintenance of equipment	16,617,247.21	
Traffic expenses	3,626,612.08	
Parlor and sleeping car expenses	1,348,979.47	
Expenses of lake and river steamers	1,183,397.40	
General expenses	4,322,103.93	
Commercial telegraph	1,613,687.64	
Total		$ 87,388,896.15

STATEMENT OF EQUIPMENT AT 30th JUNE, 1914.

Locomotives	2,248
*First and second class passenger cars, baggage cars and colonist sleeping cars.	2,174
First class sleeping, dining and cafe cars.	502
Parlor cars, official and paymasters' cars.	96
Freight and cattle cars (all kinds)	88,090
Conductors' vans	1,427
Boarding, tool and auxiliary cars and steam shovels	5,850

*Includes cars in Line Service as follows: St. John and Boston Line, 12 cars, 80.04% owned by other lines; Montreal and Boston Line, 14 cars, 68.33% owned by other lines; Toronto, Hamilton and Buffalo Line, 14 cars, 63.96% owned by other lines.

Ocean, Lake and River Steamships: Atlantic Service, 14; Pacific Service, 5; Pacific Coast Service, 25; Upper Lake Service, 5; B.C. Lake and River Service, 24; Bay of Fundy Service, 2, and Ferry Service, 2.

DESCRIPTION OF FREIGHT FORWARDED.

	1913.	1914.
Flour, barrels	8,093,936	8,802,250
Grain, bushels	171,952,738	184,954,241
Live stock, head	1,782,986	2,481,366
Lumber, feet	3,210,306,090	2,953,125,699
Firewood, cords	293,536	287,910
Manufactured articles, tons	9,519,346	8,148,012
All other articles, tons	9,625,665	9,159,112

FREIGHT TRAFFIC.

	1913.	1914.
Number of tons carried	29,471,814	27,801,217
Number of tons carried one mile	11,470,001,871	10,821,748,859
Earnings per ton per mile	0.77 cent	0.75 cent

PASSENGER TRAFFIC.

	1913.	1914.
Number of passengers carried	15,480,934	15,638,312
Number of passengers carried one mile	1,784,683,370	1,587,368,110
Earnings per passenger per mile	1.99 cent	2.05 cent

	1914.	1913.
TRAIN MILEAGE.		
Passenger trains	21,523,630	22,333,592
Freight trains	24,164,242	27,611,103
Mixed trains	1,890,364	1,888,095
Total trains	47,578,236	51,832,790
CAR MILEAGE.		
Passenger.		
Coaches and p.d. and s. cars	106,852,513	110,347,064
Combination cars	2,904,782	3,206,048
Baggage, mail and express cars	47,355,009	46,677,110
Total passenger cars	157,112,304	160,230,222
Freight.		
Loaded	526,194,125	581,397,285
Empty	169,768,349	165,627,992
Caboose	26,196,664	30,617,975
Total freight cars	722,159,138	777,643,252
Passenger cars per traffic train mile	6.71	6.62
Freight cars per traffic train mile	27.72	26.36
PASSENGER TRAFFIC.		
Passengers carried (earning revenue)	15,449,849	15,298,048
Passengers carried (earning revenue) one mile	1,570,758,210	1,766,982,013
Passengers carried (earning revenue) one mile per mile of road	132,825	155,451
Average journey per passenger ...miles	101.67	115.51
Average amount received per passenger ...$	2.06	2.28
Average amount received per passenger mile ...cts.	2.03	1.97
Average number of passengers per train mile	67.09	72.95
Average number of passengers per car mile	14.31	15.56
Revenue from passengers per passenger car mile ...cts.	29.05	30.72
Total passenger train earnings per train mile ...$	1.69	1.75
Total passenger train earnings per mile of road ...$	3,345.11	3,724.92
FREIGHT TRAFFIC.		
Tons of revenue freight carried one mile	10,601,426,321	11,242,690,998
Tons of non-revenue freight carried one mile	1,497,306,046	1,743,928,157
Total tons (all classes) freight carried one mile	12,098,732,367	12,986,619,155
Tons of revenue freight carried one mile per mile of road	896,470	989,081
Tons of non-revenue freight carried one mile per mile of road.	126,614	153,423
Total tons (all classes) freight carried one mile per mile of road	1,023,084	1,142,504
Average amount received per ton per mile of revenue freight,cts.	0.753	0.784
Average tons of revenue freight per train mile	406.89	381.12
Average tons of non-revenue freight per train mile	57.47	59.12
Average tons of (all classes) freight per train mile	464.36	440.24
Average tons of revenue freight per loaded car mile	20.15	19.34
Average tons of non-revenue freight per loaded car mile	2.84	3.00
Average tons of (all classes) freight per loaded car mile	22.99	22.34
Freight train earnings per loaded car mile ...cts.	15.17	15.15
Freight train earnings per train mile ...$	3.06	2.99
Freight train earnings per mile of road ...$	6,749.41	7,750.78

STATEMENT OF PENSION DEPARTMENT.

Balance at June 30, 1913	$681,596.60
Amount contributed by company for year	125,000.00
Amount received as interest	39,931.20
	$846,527.80
Payment of pension allowances for year	197,581.38
Balance in cash and investments	$648,946.42

Number on Pension Roll at June 30.

Under 60 years of age	68
Between 60 and 70 years of age	341
Over 70 years of age	268
Total	677

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Interswitching Charges at Fergus.

22189. July 19. Re contract entered into by the Village of Fergus, Ont., and the G.T.R., dated Dec. 3, 1903, for the construction of a branch railway in the village, containing, inter alia, an agreement by the company to transfer freight from and to the said branch to and from the C.P.R. at a rate not to exceed $3 a carload; and re the complaint of the village that the company refuses to charge the said rate for the transfer service, and has substituted therefor the interswitching tolls of general application as prescribed by order 4988, July 8, 1908. It is ordered that the notice cancelling the exception of the interswitching service between the G.T.R. sidings on the town spur at Fergus and the C.P.R. from the operation of General Interswitching Order 4988, July 8, 1908, the said cancellation having been made effective on April 15, 1914, by Supplement 15 to G.T.R. Special Tariff C.R.C. no. R. 2457, be disallowed, and the toll of $3 a car for the said service, as published in Tariff R 2457, be restored on lawful notice within ten days from the issuance of this order.

Transportation of Celluloid by Express.

22200. July 11. Re application of Express Traffic Association of Canada for an order prohibiting the carriage by express of celluloid in certain forms, and prescribing the conditions under which celluloid in other forms may be carried. Upon the consideration of what has been filed in support of the application, the consent thereto of the Canadian Manufacturers' Association and the Boards of Trade of Montreal and Toronto, and the report of the Chief Traffic Officer of the Board; and it appearing that the order applied for will bring the regulations for the carriage of the said articles into conformity with those of the Post Office Department, it is ordered that packages containing celluloid (except liquid celluloid and celluloid scrap), also articles composed wholly or partly of celluloid, for carriage by express between points in Canada, be conspicuously labelled "Celluloid—Inflammable"; also that the carriage of liquid celluloid and celluloid scrap by express be prohibited. And it is further ordered that the Express Classification for Canada be forthwith amended accordingly.

Coal Rates to York, Ont.

22220. July 16. Re application of Canadian Retail Coal Association for a rate of 60c. per ton on coal, in carloads, from Buffalo, Black Rock, or Suspension Bridge, N.Y., to York, Ont. It is ordered that the G.T.R. tariffs on coal, in carloads, from the Niagara frontier gateways, and from Detroit, be amended so as to apply to York, Ont., the rates shown therein as applying to Toronto; said amendments to take effect not later than Sept. 1, 1914.

G.T.P.R. Prairie and Mountain Rates.

22228. July 20. Re complaint of G.T.P. Ry. against the decision of the Board establishing Hinton, Alberta, as the point of juncture of the applicants' prairie and mountain rate scales prescribed in the judgment in the Western Rates Case, dated April 6, 1914. Upon the consideration of written submissions and statistics of construction costs filed with the Board by the applicant, and the Board having, since the issue of its judgment, inspected the applicants' railway between Thornton and Hinton, it is ordered that Thornton, Alberta, instead of Hinton, be the point of juncture of the prairie and mountain scales of rates to be charged by the applicant, as prescribed in the judgment of April 6, 1914.

Rating of Rocmac.

22356. Aug. 6. Re application of Rocmac Road Corporation of America, Ltd., for a reduction in rating in the Canadian Freight Classification from 7th class to 10th class, on Rocmac in carloads. It is ordered that the application be dismissed.

Team Track Delivery at Toronto.

22369. Aug. 10. Re G.T.R. tariff, C.R.C. 2457, and complaint of Toronto Board of Trade and of Leak & Co., Ltd., of Toronto, complaining of refusal of G.T.R. to accept from the Canadian Northern Ontario Ry. carload freight requiring team track delivery at Toronto. It is ordered that the G.T.R. tariff applies to and includes traffic offered to it by the Canadian Northern Ontario Ry. for delivery on team tracks at Toronto; and the G.T.R. is required to accept forthwith carload traffic offered by the C.N.O.R. for team track delivery at Toronto.

Increased Special and Competitive Tolls.

General Order 129. Re increased special and competitive freight and express tolls, and suspensions thereof. In pursuance of the powers conferred upon the Board by secs. 26 and 348 of the Railway Act, and of all other powers possessed by it in that behalf: Upon the recommendation of the Chief Traffic Officer of the Board—It is ordered as follows:—

1. No toll contained in any special or competitive freight or express tariff referred to in subsecs. 3 and 4 of sec. 326, and subsec. 2 of sec. 348 of the Railway Act, shall be advanced until it has been in force for at least 30 days: Provided that when a special or competitive freight or express tariff contains a notice that any reduced toll shown therein will expire upon a given date, which date shall not be less than 30 days from the date upon which the said reduced toll becomes effective, the said notice shall be considered to comply with subsec. 3 of sec. 328 of the Railway Act, as amended by 1-2 George V., chap. 22, sec. 11.

2. Except of its own motion, or on special grounds advanced, the Board will not ordinarily suspend or postpone the effective date of any tariff, or any supplement to a tariff, or any particular rate, or rule, or regulation of the carriers subject to its jurisdiction, which directly, or in effect, increases the charge to be paid for the same or similar service, unless an application for suspension or postponement is received by the Board at least 14 days before the date when the charge complained against is published to become effective; such application to give the C.R.C. number of the schedule and the items thereof complained against.

Baggage car traffic.—The Board of Railway Commissioners will, at its sitting in Ottawa, on Sept. 15, consider the matter of proposed rules governing baggage car traffic.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alaska.—It is reported that rapid progress is being made with the United States Government surveys for a railway in Alaska. The surveys are being made under the direction of A. Mears, whose report is expected to be completed in December. The project is to build a line from the Pacific Coast through the centre of Alaska to the International boundary, on the Yukon River. (April, pg. 165.)

Alberta and Great Waterways Ry.—Press reports state that 35% of the grading on this line, from the point of junction with the Edmonton, Dunvegan and British Columbia Ry., to Lac la Biche, has been completed and that the remaining work will be done by Dec. 30. Track laying has been started, and it is hoped that steel will reach Lac la Biche by Dec. 30. (Aug., pg. 370.)

Algoma Central and Hudson Bay Ry.—It is reported that the extension of the line to the National Transcontinental Ry., about 300 miles from Sault Ste. Marie, Ont., will be completed by Sept. 30. (Sept., 1913, pg. 432.)

Burrard Inlet Tunnel and Bridge Co.—We are officially advised that the three offers for the construction of the proposed bridge over the Second Narrows of Burrard Inlet, Vancouver, B.C.,—viz., from the Canadian Bridge Co.; the Dominion Bridge Co., and C. A. P. Turner, Vancouver,—have been submitted to R. Mojeski, consulting engineer, Chicago, Ill., for a report. The consideration of the plans was expected to take several weeks. (Aug., pg. 370.)

Dominion Atlantic Ry.—It is estimated, according to press reports, that since the C.P.R. acquired control of the D.A.R. about $2,500,000 has been expended upon betterments. The bridges on the line have been reconstructed, and the track brought up to C.P.R. standard, the largest work being the reconstruction of the Bear River bridge, the cost of which is put at $1,500,000. (June, pg. 266.)

Edmonton, Dunvegan and British Columbia Ry.—The bridge which has been completed across the Athabasca River at Smith, has a total length over all of 925½ ft. It consists of four 150 ft. deck truss spans, one 170 ft. through truss span, and two 70 ft. girder spans, resting on concrete piers and abutments. The through span, which is over the navigable channel, gives a clearance of 42½ ft. above high water. The cost of the bridge was about $300,000 and it was built in a little over six months. Trains have been passing over it regularly since July 20, when the ballasting of the line to Sawbridge was started, and it was expected to have a regular train service from Edmonton to that place Sept. 1. The track laying gang is expected to reach Big Smoky River by Dec. 31. J. D. McArthur, President and general contractor, returned from a trip over the line early in August. He went out on the route as far as Peace River Crossing, at which point a bridge estimated to cost $300,000 is to be erected. (Aug., pg. 370.)

Erie and Ontario Ry.—We are officially advised that a contract has been let to Fitch and Douglass, Oshawa, Ont., for grading, and to R. Bennett, Dunnville, Ont., for fencing on the first section of this line to be put under construction, viz:—from Southville, on the Toronto, Hamilton and Buffalo Ry. to Dunnville, 15 miles. The right of way and the necessary land for terminal purposes are being rapidly acquired.

The extension of the line from Dunnville to Port Maitland, will not be put under contract until 1915. (Aug., pg. 370.)

Esquimalt and Nanaimo Ry.—The extension from Parksville to Courtenay, B.C., was formally opened for traffic, Aug. 6. The extension is 44½ miles long, and the distance from Victoria to Courtenay by rail is 140 miles. The line has been built to the C.P.R. standards, all bridges and other structures being of a permanent character, of the same class as those put in on the original line acquired from the Dunsmuir interests in 1908. At Union, the seventh station from Parksville, a connection is made with the Wellington Colliery Co.'s railway. The station heretofore described as McBride Jct. has been renamed Parksville. The original section of the line from Esquimalt to Nanaimo, including the connection with Victoria, 73 miles, was opened for traffic, Aug. 13, 1886, and no further construction was undertaken until the line passed under C.P.R. control. On Dec. 30, 1911, an extension from Wellington to Port Alberni, 54 miles, was opened for traffic, and on June 18, 1913, an extension from Duncan to Cowichan Lake, 18 miles, was opened. The opening of the new extension gives the company 189½ miles of line on Vancouver Island.

The Outlook in Canada

TRULY, it is an ill-wind that blows nobody good. One Continent's "down" is another Continent's "up." The industries of Europe are, generally speaking, at a standstill, and matters will be worse before they can be better.

The whole world is looking to the North American Continent—to Canada and the United States—for much of its provisions, machinery, textiles, boots and shoes, beverages, vehicles, cement, brick, earthenware, fancy goods, furs, glass, garments, paper, soap, tobacco, wood products, and much else. Canada must get ready to meet the demand made upon her. We have continued prosperity ahead of us if our manufacturers and merchants rise quickly to take advantage of their opportunity.

It is a time for business hopefulness, not for business gloom.

The B.C. Government has approved of plans for the extension of the line to Duncan Bay, but it has not been decided when the work will be gone on with.

The company's shops, which heretofore have been located at Wellington, have been transferred to Victoria, where new buildings have been erected on the terminal site acquired on the Songhees Indian reserve. A description of these shops, and of the terminal layout was published in Canadian Railway and Marine World for March. (Aug., pg. 370.)

Essex Terminal Ry.—The grading of the extension to Ojibway, Ont., is reported to be completed, and tracklaying is in progress. It is said that when this work is completed, which will give railway connection with all the lines converging on Windsor, the erection of the buildings for the steel works will be started. (Dec., 1913, pg. 570.)

Glengarry and Stormont Ry.—We are officially advised that a contract has been let to Atchison & Co., and Henry Williams, Cornwall, Ont., for the erection of the station buildings at the corner of Pitt and Sixth streets, Cornwall, Ont. The station will be of the C.P.R. standard type. (Aug., pg. 370.)

Intercolonial Ry.—The general plans for the layout of the new terminals at Halifax, N.S., proposed by Ross and Macdonald, Montreal, are reported to have been approved by the General Manager and the Department of Railways. The general scheme consists of a passenger station building in the form of the letter T, the foot of the letter being at the shore end, and the head at the steamship landing stage. At the shore end of the building will be accommodation for the local trade of Halifax, the city station facing on a plaza between South and Tobin streets. The upper floors of the building will have offices for the general railway and steamship business. The buildings along the stem and foot of the letter will be utilized for the incoming and outgoing steamship business. The landing stage will be 2,800 ft. long, one-third being set apart for passenger, baggage, mail and express traffic, and the remainder for freight traffic.

The question of the extension and improvement of the terminals at Sydney, N.S., was recently discussed with F. P. Gutelius, General Manager. The Board of Trade was informed that it is proposed to make extensive repairs and improvements to the old government wharf at Barrack Point, and after a full discussion the Board passed a resolution approving of the suggestion provided that the wharf be extended 300 ft. It was pointed out that this extension of the wharf would not interfere with the laying out of large ocean terminals at some future time.

Several engineering parties are reported to be in the field in Cape Breton surveying routes for possible extensions or diversions. The principal route being surveyed is from Orangedale to Cheticamp, which would pass through Whycocomagh, Lake Ainslie, Margaree, Dunvegan, St. Rose, Chimney Corner, Belle Cote and Grand Etang. The country through which the line would pass is largely coal bearing, and some small colliery lines have already been built, the most important being the Inverness Ry. and Coal Co.'s line.

An agreement has been reached with the Moncton, N.B., City Council with reference to the elimination of local crossings in the city, subject to the approval of the ratepayers. The agreement provides that subways are to be put in at Main and Lutz streets, and overhead bridges to be erected at Victoria, Church and Union Streets, while Queen St. is to be left as it is at present. The city will contribute $50,000 towards the cost. The proposition has to be approved by the Minister of Railways.

Tenders are under consideration for the erection of a coaling plant at Newcastle, N.B.

Large forces are at work on the Canada Eastern Division laying new ties, putting down heavier steel, and otherwise improving the old Canada Eastern Ry. The line from Fredericton to Loggieville, 129 miles, is being relaid with 85 lb. steel. The 30 miles between Blackville and Derby Jct. have already been so laid and it is expected that a further distance of 40 miles will be laid this year. (Aug., pg. 370.)

Kettle Valley Lines.—Press reports from Vancouver, B.C., state that the construction reports to July 30 on this line indicate that the work will be so far completed that the Okanagan fruit district will be given a connection with that city via Spence's Bridge, on the C.P.R. by Dec. 31. This simply means that the central part of the line will by that time be linked up with the Nicola, Kamloops and Similkameen Ry. at Merritt,

over which traffic can be carried to Spence's Bridge. This section will not be connected with the Midway-Hope line until some time in 1915. Construction on this east and west line, which is the main line, is reported to be progressing favorably. (Aug., pg. 370.)

Lake Erie and Northern Ry.—The question of the building of a station in Brantford, Ont., is being held up following the recent decision of the Board of Railway Commissioners not to permit the use of the park property at the foot of Scarfe Ave. and Church St.

It is said that while the line from Brantford to Galt, Ont., will be operated by steam power, as soon as the whole line is completed the passenger traffic will be operated by gasoline cars. (Aug., pg. 370.)

Medicine Hat Southern Ry.—The Board of Railway Commissioners has authorized the company to build its line across the C. P.R. in Medicine Hat, Alta.

The M. H. S. R. Co. was incorporated by the Alberta Legislature in 1913, to build a railway from sec. 2, tp. 11, range 6, west of the 4th meridian, northerly to sec. 2, tp. 12, range 6, and on to the limits of the city of Medicine Hat. The company may use electricity, steam or any other motive power. The provisional directors are:—L. Hunt, H. O. Knowles, S. G. Bannan, Medicine Hat.

Pacific Great Eastern Ry.—Press reports state that track has now been laid from Squamish to beyond Cheakamus, and that grading has been completed to Lillooet, mileage 120 from Squamish. It is expected to have the grading from Lillooet to Clinton completed in the autumn, and track laid by the end of the year. About 10% of the grading is reported to have been done between Clinton and Lac la Hache, and considerable work has been done thence to Fort George. It is reported that further subcontracts have been let at this end of the line which is being built from Fort George, as follows:—Welch and Kennedy, 4 miles; Rankin and Kellett, 20 miles; Madden Bros., 6 miles.

A temporary bridge has been erected across the Nechaco River at Fort George, to facilitate the preliminary work on the extension to the Alberta boundary. Location surveys are reported to be well advanced, and it is expected that construction work will be started as soon as possible. Local reports state that it is intended to build a branch to Dawson, Yukon, and that Finlay Forks has been selected as the point from which it will start. (Aug., pg. 371.)

Pacific, Peace River and Athabasca Ry.—We are officially advised that this company was incorporated last session of the Dominion Parliament to build a line from the mouth of the Naas River, B.C., to Prince Albert, Sask. The route to be followed is by the Naas River, Courier Creek, Skeena River, Bear River, Bear Lake, Driftwood River, North Tacla Lake, via Hogan Pass to the Omineca River, the Findlay branch of the Peace River, along the north side of the main Peace River easterly and northerly to the Vermillion rapids or chutes, thence crossing the river at this point and continuing down the right bank of the Peace River to Point Providence, thence easterly to the mouth of the Athabasca River, along that river to Fort McMurray, thence easterly to Clearwater and Pembina River, and by the Bear River easterly, southerly and easterly to Prince Albert, Sask. The line projected would have a total length of 1,500 miles; the capital of the company is fixed at $15,000,000, and the principal promoter is D. A. Thomas, Cardiff, Wales, one of the largest coal operators in the world. The statutory meeting for the organization of the company will be held Sept. 8.

The company has five survey parties in the field engaged on reconnaissance work, viz.:—From Prince Albert to Fort McMurray; from Fort McMurray to Peace River Crossing; from Peace River Crossing to Findlay Branch of Peace River; thence to Ground Hog Mountain Coal Basin; thence to the mouth of the Naas River.

In connection with this enterprise the Peace River Tramway and Navigation Co. was incorporated last session of the Dominion Parliament. It has an authorized capital of $1,000,000 and power to issue bonds for $30,000 a mile of line. The company proposes to build a tramway around the Peace River Falls or chutes below Fort Vermillion, three miles, and another on the Slave Lake from Smiths Landing to Fort Smith, 16 miles, opening direct transport through to the Arctic Ocean. The company is also authorized to operate steamships and to generate and dispose of electric energy, and to operate docks, wharves, elevators, etc. The location surveys for the two tramways are practically completed and everything should be ready for construction in the spring of 1915. The statutory meeting for organization is to be held early in September. C. F. Law, Vancouver, B.C., is Canadian agent for both companies. (Aug., pg. 371.)

Peace River Tramway and Navigation Co.—See Pacific, Peace River and Athabasca River Ry.

Will Canada Carry Her Burden?

GREAT BRITAIN and Europe, where productive industry has been paralyzed, have mouths to feed, bodies to clothe, constructive operations to carry through, and a thousand-and-one wants and needs to be satisfied—and Great Britain and Europe look to Canada in confidence for much of the needed supplies.

It were folly for Canadian manufacturers and merchants to be down-hearted during these terrible times in Europe. A great burden—a great duty—a great responsibility—has been imposed on Canadian manufacturers, merchants, bankers and workers. Shall Canada and Canadians shirk this burden, this duty, this responsibility?

What's the Answer?

Quebec Central Ry.—The extension along the Chaudiere River valley, we are officially advised, is being gradually pushed forward to Lac La Frontier, Montmagny county, Que. The first five mile section from St. Sabine to St. Camille was put under contract in 1913, and the work is completed. P. J. Wolfe, Sherbrooke, Que., who had the contract, was given a contract this year for the construction of a further five miles beyond St. Camille. This is now in hand, and it is expected to have it completed by Oct. 31. On this section there is one large bridge, consisting of three spans of 80 ft. each, which is being erected by the Dominion Bridge Co., and was expected to be completed by Aug. 31. As soon as this section is completed the 10 miles from St. Sabine will be put in operation. The extension from St. Camille to Lac La Frontier, 15 miles, will, it is expected, be put under contract in 1915. (Aug., pg. 371.)

St. John and Quebec Ry.—Press reports state that a sub contract has been let to Kennedy and McDonald for grading on the Centreton-Andover section of this line, now under construction along the St. John River Valley in New Brunswick. (Aug., pg. 371.)

Timiskaming and Northern Ontario Ry.—A contract is reported let to Sherwood and Sherwood for the erection of a station at Elk Lake. (May, pg. 215.)

The Van Buren Bridge Co. has deposited with the Secretary of State, at Ottawa, certified copy of its charter granted by the State of Maine; certified copy of the Act of Congress of Mar. 4, 1913; and a transfer of the rights of the Restigouche and Western Ry. to build a bridge across the St. John River at St. Leonards, N.B., to Van Buren, Me. The object is to provide a railway connection in the United States for the line from Campbellton to St. Leonards. The principal promoters of the railway, which has just been taken over by the Dominion Government as a branch of the Intercolonial Ry., was T. Malcolm, who is also the principal promoter of the Van Buren Bridge Co.

The Minister of Railways has approved route plan of the line from the International Ry. of New Brunswick, in St. Leonards, N.B., to the International boundary at the centre of the St. John River.

The Act of the Dominion Parliament vesting the charter rights of the Restigouche and Western Ry., so far as its rights to build this bridge are concerned, was brought into effect by proclamation, July 13. (July, 1913, pg. 333.)

Western Dominion Ry.—We are officially advised that the entire location of this projected railway was completed in 1912. The route is from the International boundary, in range 23 west of the 4th meridian, northwesterly via Cardston and Pincher Creek to Lundbreck, on the C.P.R. Crowsnest branch, thence northerly in the valley between the Porcupine Hills and the footbills of the Rocky Mountains to Calgary, 201 miles. The location on the southern section of the line was done under the charge of J. H. Fine, and that on the northern section under the charge of H. W. Goodman.

Construction has been started on the section between Pincher Creek and the crossing of Waterton River. J. F. H. Connell, Calgary, Alta., is Chief Engineer. (Aug., pg. 371.)

Winnipeg.—The Commissioners for the Greater Winnipeg Water District have let a contract to C. J. E. Maxwell, Transcona, Man., for a residence for the Superintendent of the Commissioners' railway, a station and other buildings, at Deacon, Man., at a cost of $13,000. (Aug., pg. 371.)

Railway Terminals in Victoria.—In connection with the laying out of the Songhees Indian Reserve at Victoria, B.C., for railway terminals by the Esquimalt and Nanaimo Ry. (C.P.R.) and the Canadian Northern Ry., a bridge is to be erected giving connection with the business part of the city. The estimated cost is $400,000, excluding the approaches, and the cost of the land, which is put at an additional $275,000. The city will provide the land on the east side of the bridge and build the approaches; the Provincial Government will provide the land on the west side of the bridge. The bridge itself will be erected by the E. and N. Ry., the B.C. Electric Ry. and the Provincial Government. It will be provided with one track for the E. and N. Ry., two tracks for the B.C.E. Ry., and two roadways each 11 ft. wide. Provision will be made for the passing of vessels, either by a 130 ft. bascule span, or by two 110 ft. draw spans.

Locomotive Cleaning.—The practice of washing down locomotives with a spray of hot water and fuel oil, instead of wiping them down, is reported to have been adopted on the Delaware, Lackawanna and Western Rd., the Atlantic Coast Line and a few other roads, and it is said that uniformly satisfactory results have been secured, both on the basis of results and cost of doing the work.

Railway Finance, Meetings, Etc.

Algoma Central Terminals, Ltd.—In commenting on the recent failure of the Canadian Agency, Ltd., in London, Eng., the Canadian Gazette stated recently that in Mar., 1913, the Canadian Agency offered for public subscription £527,300 of 5% first mortgage bonds of A. C. T., Ltd., at 96, interest and principal guaranteed by the Lake Superior Corporation. The payment of the instalments was completed in the following May, but the bonds have not been delivered in exchange for the Canadian Agency scrip, though interest has been paid each August and February. Now on the failure of the Canadian Agency, it is found that about £100,000 of the money subscribed has been "disapplied," and the question is, how is this altogether unprecedented difficulty to be met? All the parties concerned are, no doubt, to blame, the subscribers who did not insist on the delivery of the bonds on the payment of the scrip coupon of Aug. 1 last year, and the Algoma Central Terminals, Ltd., and the Lake Superior Corporation, on whose behalf the bonds were issued.

It is announced by the scrip holders' committee that an agreement has been reached with the company regarding the undelivered bonds. Each holder of the Canadian Agency scrip for Terminal bonds, on payment to the company or its nominee, of 10% of the face value of his scrip, shall be entitled to receive from the company, on the surrender of his scrip for cancellation, his pro rata proportion of the £127,000 Terminal bonds, carrying Aug. 1, 1914, and subsequent coupons. Each scrip holder will, on payment, simultaneously receive his pro rata proportion of the £400,000 bonds now held by the committee on their behalf. The company agrees to pay stamp duty on bonds thus distributed. Under this arrangement, the holders of scrip for £1,000 bonds will, on payment of £100, be entitled to receive £1,000 bonds duly stamped. The company agrees to provide funds to meet any prior interest unpaid on scrip surrendered under the foregoing scheme, and to cover the payments which the committee has to make for legal and other expenses. The company will assign to a trustee on behalf of the scrip holders, all rights and claims it possesses against the Canadian Agency in respect of the last instalment of purchase money. All sums recovered in respect of such rights or claims to be applied by the trustee, as to that proportion which represents scrip holders who make the 10% payment, on behalf of the scrip holders, and the balance as the company directs. Only those scrip holders who make the 10% payment are to be entitled to the benefit of the agreement, which is without prejudice to the company's rights against the other scrip holders.

Canada Atlantic Ry.—The certificate of the chairman of the general meeting of shareholders held in Ottawa, July 29, showing that amalgamation of the C. A. Ry. Co. with the G.T.R. Co. was assented to, as required by the Amalgamation Act of 1914, has been filed with the Secretary of State at Ottawa.

Canadian Northern Ry.—There has been deposited with the Secretary of State at Ottawa a deed, dated Feb. 21, between the company and the National Trust Co., securing an issue of bonds, which, with prior issues now outstanding, will amount to $15,000 a mile on certain of the company's lines in Manitoba and connecting therewith.

There has also been filed with the Secretary of State a mortgage deed, dated July 15, made between the company, Mackenzie, Mann & Co., Ltd., the National Trust Co., the British Empire Trust Co., and the Dominion, securing an issue of $45,000,000 of bonds authorized by last session's legislation.

Canadian Pacific Ry.—A special general meeting of shareholders has been called for Oct. 7, following the annual general meeting, for the purpose of considering the question of increasing the capital stock of the company from $260,000,000 to $335,000,000, this being the full amount authorized by the Dominion Parliament. According to the President's statement it is not intended that there shall be any new issues at the moment, but this is merely to enable the directors to provide for the future capital requirements as and when they arise.

Central Ry. of Canada.—A meeting of shareholders has been called to be held at Montreal, Sept. 8, to transact general business.

Grand Trunk Pacific Ry.—The shareholders, at a meeting in Montreal, July 22, ratified the provisions of the mortgage to be entered into with the Dominion Government to secure the additional amount of bonds guaranteed by Parliament last session.

Courage, Canada

CANADA is favored among the nations. We have peace within our own borders. We have learned the lessons taught by lean times, and so are prepared to face the days ahead. Our farmers are prospering by reason of the present conditions—and when agriculture flourishes, the business outlook is one of good hope and good cheer.

Some Canadian industries and mercantile enterprises must suffer because of the partial suspension of trans-oceanic trade. But more industries will be stimulated to supply our home demand, which MUST be satisfied. It is a time of business opportunity in Canada.

Let Courage Possess Us.

Supplementary deeds have been deposited with the Secretary of State at Ottawa, securing bonds to be issued on the company's branch lines in Saskatchewan and Alberta, the bonds being guaranteed by the Provinces of Saskatchewan and Alberta respectively.

Lake Huron and Northern Ontario Ry.—A special meeting of shareholders was called to be held at Bruce Mines, Ont., Aug. 25, for the purpose of approving a contract for the building of the main and branch lines authorized, and for the equipment of the same. The notice calling the meeting was signed by G. P. McCallum, President, and H. Appleton, Secretary.

New York, New Haven and Hartford Ry.—According to an arrangement made between the United States Government and the directors, Aug. 11, the company will be dissolved into its original component parts and the proceedings against it under the Sherman anti trust law will be abandoned. It is stated that as a result of this arrangement the interests of the shareholders will be better conserved than if the proceedings were continued. Among the companies involved are the Boston and Maine Rd., the Maine Central Rd., and the Rutland Rd., all of which have Canadian connections.

The cases against directors and officials in the criminal courts of New York are not affected by this arrangement. They have been set down for hearing at the September sittings.

Quebec Oriental Ry.—A deed dated June 28, between the company and the Royal Trust Co., securing an issue of £100,000 of 5% prior lien bonds on the Matapedia section, has been filed with the Secretary of State at Ottawa. This deed cancels the deed of Oct. 22, 1912, securing an issue of £50,000 of bonds previously deposited.

St. Mary's and Western Ontario Ry.—A duplicate of an indenture made June 22, between H. S. Osler, Toronto, the company and the C.P.R., has been deposited with the Secretary of State at Ottawa.

Temiscouata Ry.—Net earnings for June, $7,513; aggregate net earnings for 12 months ended June 30, $64,787.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to July 21, $746,782, against $437,423 for same period 1913.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,928,800	$1,414,500	$514,300	$19,700
Aug.	1,824,800	1,416,200	408,600	37,800
Sept.	1,994,900	1,470,000	524,900	101,400
Oct.	2,687,100	1,683,000	1,004,100	298,800
Nov.	2,673,300	1,708,500	964,800	87,000
Dec.	2,256,000	1,632,000	624,000	43,000
Jan.	1,576,900	1,218,000	352,900	82,700
Feb.	1,324,600	1,086,000	238,600	x29,900
Mar.	1,533,400	1,173,000	360,400	x71,100
Apr.	1,610,000	1,195,800	414,200	x88,900
May	1,641,600	1,160,000	481,600	x98,600
June	1,655,300	1,192,000	463,300	x79,200
	$22,700,700	$17,349,000	$6,351,700	$302,700
Incr.	.....	.....	$ 302,700	.....
Decr.	$ 279,100	$ 581,800	.....	.....

x Decrease.

The mileage operated at the end of June was 4,670, against 4,297 at the same period 1913.

Approximate gross earnings for July, $1,594,300, against $1,928,800 for July, 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1912-13, from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$11,993,062.27	$7,876,269.09	$4,116,793.18	x$331 383.72
Aug.	11,434,459.88	7,473,320.64	3,961,139.24	x756,786.42
Sept.	12,157,082.17	7,741,503.48	4,415,578.69	165,274.84
Oct.	14,480,216.73	8,877,358.94	5,602,857.79	541,970.60
Nov.	13,407,015.31	8,518,769.25	4,888,246.06	630,107.02
Dec.	11,814,325.67	7,587,503.96	4,226,821.71	x168,897.80
Jan.	7,916,216.25	6,916,042.19	1,000,174.06	x662,199.72
Feb.	7,594,172.73	6,122,596.27	1,471,576.46	x1,048,492.88
Mar.	9,447,461.24	6,348,222.37	3,099,238.87	x756,178.02
Apr.	9,720,461.58	6,375,596.56	3,344,865.02	x600,212.58
May	9,795,928.94	6,832,917.24	2,963,011.70	x541,018.16
June	10,054,421.06	6,718,796.16	3,335,624.90	292,129.68
	$129,814,823.83	$87,388,896.15	$42,425,927.68	$3,819,946.47
Decr.	$9,580,876.15	$ 5,760,929.68	$ 3,819,946.47	.....

x Decrease.

Approximate gross earnings for July, $10,041,000, against $11,555,000 for July, 1913.

At the end of July, the mileage under operation was increased to 12,227.

Grand Trunk Railway Earnings.

The following figures show the earnings of the Grand Trunk Ry., Grand Trunk Western Ry., and Detroit, Grand Haven and Milwaukee Ry., for July, compared with those for July, 1913. As the Canada Atlantic Ry. has now been amalgamated with the G.T.R., its figures are incorporated with those of the G.T.R.:—

	1914	1913	Increase	Decrease
G.T.R.	$3,894,339	$4,205,576	.....	$311,237
G.T.W.R.	610,854	632,633	.....	21,779
D.G.H. & M.R.	222,018	207,350	$14,668	.....
Totals	$4,727,211	$5,045,559	.....	$318,348

Grand Trunk Pacific Railway Earnings.

The approximate earnings for the Prairie Section and Lake Superior Branch, 1,104 miles, for July, were $429,753, against $519,556 for July, 1913.

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NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

ADVERTISING COPY must reach the publishers by the 10th of the month preceding the date of publication.

TORONTO, CANADA, SEPTEMBER, 1914.

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The Effect of the War on Transportation.

A comparatively few years ago, certainly within the memory of many persons now living, a war in any particular part of the world was practically localized, both as to its theatre and its effect. With the vast improvements which have taken place in modes of transportation and communication within the past fifty years or so, it is now impossible for a war of any magnitude to take place anywhere without some effect being immediately apparent throughout the world. The present war involves the greatest naval and military powers, and a number of minor ones, and practically the whole of Europe has been drawn into the vortex.

It would be idle to deny that the war has a depressing effect on business generally, but now that the first alarm has passed, it can be seen that in many ways not only is the present a good time in which to take stock and prepare for the inevitable rush of business which will occur on the cessation of hostilities, but that, for those concerned with business in general on the American continent, it is the time to step into the breach made by the withdrawal of European competition, and by a judicious and possibly lavish expenditure of money and labor, to supply the demands of those who have been accustomed to purchase in foreign countries, and in addition meet all the requirements of Great Britain and the friendly nations, so far as foodstuffs and other necessary materials are concerned.

Good Times Ahead

THE sudden breaking out of war caused many to "run to cover." Like the chicken on whom the rose leaf fell, some of us became a prey to fear and were ready to declare "the sky is falling."

Now our vision is clearing, our alarm has fled, we have recovered our poise and our courage. We are seeing, also, our opportunity. Swiftly and almost overwhelmingly has come to us the perception of the fact that the competition of Continental Europe has been taken away. We are faced with a condition and an opportunity both tending to our advantage as a country of industry, agriculture and trade. Good times are ahead, if Canada and Canadians see and seize the present opportunity for enlarging their industries and trading.

We must be careful. We must have courage.

The safety of the ocean roads for British shipping is practically assured, and in fact it was never seriously menaced. The predominance of British shipping on the high seas would possibly have made it comparatively easy for a foreign nation to deal a series of disastrous blows, but the very prompt action of various sections of the British Navy practically cleared the seas of German shipping in a short time and kept in check the German war vessels scouring the seas in the hope of disorganizing British shipping.

During the first week of August there was some necessary dislocation of service between the American continent and Europe, and between Canada and the Orient, part of which was due to the withdrawal of vessels from their respective routes for British Government service, and part due to "safety first." So far as British vessels were concerned, those which had but recently left ports on this side were recalled by wireless telegraphy to await a better opportunity of crossing; others, which were nearer the British side of the ocean, proceeded to the nearest British port with caution, and no instance has been reported of loss. Regarding German vessels, they were in a different position, as, it being practically impossible for them to make any German port, and impossible, under the circumstances, to put in at a British port, at whatever point of their voyage they happened to be when they received messages their only course was to make with all speed for a neutral port or be captured. Some captures have been reported, but a number of the finest ocean-going vessels flying the German flag are laid up in New York harbor, where, for the time being, they are useless. In this connection the North German Lloyd and the Hamburg-American Line have announced that they are willing to sell the vessels lying in neutral harbors, and it is reported that United States capitalists are negotiating for their purchase. Legislation is being discussed in Washington, by which the U.S. Government would appropriate $25,000,000 towards such purchase and possibly make up any difference should a specified amount not be realized by public subscription, and thus form the basis of a Government controlled merchant marine.

Proclamations have been issued covering regulations prohibiting residents in the Dominion from trading with residents of the German Empire, or with Austria-Hungary, and no British ship is permitted to leave for, or communicate with any port or place in either of the countries named. The exportation of arms of all kinds, explosives, etc., and a number of other articles of use in times of war, is prohibited to any country except the United Kingdom and British possessions, and the exportation of coal is prohibited except to the United Kingdom, British possessions, the United States, Japan, France and Russia.

Canadian Northern Railway to be Pushed to Completion.

A Vancouver press dispatch of Aug. 26 credits Sir Donald Mann with saying there:—"Despite the chaotic conditions of the money markets, due to the war situation, we intend to finish up the transcontinental line as quickly as possible."

Sir Donald, who went on to Victoria to confer with the Premier, Sir Richard McBride, is also reported to have said that the company has 3,000 men employed in British Columbia and will keep them at work until rail laying is finished. Grading, he believes, will be finished by the end of September. Steel has been delivered or is en route for all sections of the main line west of Yellowhead Pass, and the line north of Lake Superior will be in operation this autumn.

Route Maps Approved.—The following route maps have been approved by the Minister of Railways since July 17:—Canadian Pacific Ry.—From Dunelm to Instow, Sask., 42.5 miles. Toronto and Niagara Power Co.—Transmission lines in Welland county from Niagara Falls to Thorold and Welland, Ont., 40 miles. Van Buren Bridge Co.—From junction with the International Ry of New Brunswick in St. Leonards, N.B., to the International boundary at St. John River, one mile.

Canadian Ticket Agents' Association. — As previously announced, the annual outing will be held at Chicago, Oct. 6, 7 and 8. The business meeting will be on Oct. 6 at the Hotel Sherman, which will be the headquarters.

The C. P. R. will, in its building at the San Francisco exposition, have moving pictures of Canadian scenery and products.

Two Railways Bought for the Intercolonial.

The Department of Railways took over at midnight, July 31, two railways in New Brunswick, and is operating them as branches of the Intercolonial. The purchase of these lines is part of the Government's general policy to acquire as feeders for the I.R.C. some, if not all, of the small, independent and not particularly profitable lines in Quebec, New Brunswick and Nova Scotia, which connect with the I.R.C. This policy took shape during the closing years of the late administration, and while there is no enactment authorizing the Government to acquire the lines, the general policy is to acquire from time to time such lines as may be useful, subject to the subsequent ratification of Parliament. In connection with the development of this policy, the Department of Railways acquired the line formerly operated by the Nova Scotia Steel Co., in the vicinity of New Glasgow, N.S., and undertook the construction of the line from Dartmouth, N.S., through the Musquodoboit River Valley, which private interests had been trying to finance for many years. The additional lines now purchased are the International Ry. of New Brunswick, and the New Brunswick and Prince Edward Island Ry.

International Railway of New Brunswick.

The history of this line starts with the passing by the New Brunswick Legislature in 1897 of an Act incorporating the Restigouche and Western Ry. Co. to build a railway from Campbellton to the St. John River, at some point between Grand Falls and Edmundston, N.B. Three years later the company was granted authority by the Dominion Parliament, subject to the necessary authorization by the United States being obtained, to build a bridge across the St. John River, at whatever point was selected as the western terminus of the line, such bridge to be considered to be a work for the general advantage of Canada. Subsequently, authority was obtained from the Quebec Legislature and from the Dominion Parliament to build a bridge across the Restigouche River at the eastern end of the line so as to connect it with the line to Gaspe, Que. The N. B. Legislature and the Dominion Parliament voted subsidies in aid of the line, and construction was started at Campbellton by T. Malcolm, the promoter and general contractor. In 1905 the International Ry. of New Brunswick was incorporated under the N.B. Companies Act to carry on the work. In 1906 the Legislature passed an Act ratifying the incorporation of the International Ry., and providing that in the event of the R. and W. Ry. not redeeming $150,000 of debentures within three months the 10 miles of line built would become vested in the International. This was subsequently done, and construction proceeded. The guarantee of bonds by the N.B. Legislature, which stood at $5,000 a mile, was increased to $8,000 a mile in 1907. The line from Campbellton to St. Leonards, on the St. John River, was completed and put in operation Dec., 1910. The Dominion Government does not acquire the rights of the Restigouche and Western Ry. to build a bridge across the St. John River, these having been transferred under an Act passed last session to the Van Buren Bridge Co.

The financial statement at June 30, 1913, shows:—Capital stock outstanding, $1,320,000; bonds outstanding, $896,000; total, $2,216,000. The Dominion Government subsidy paid was $725,288.07; the New Brunswick subsidy was $275,000, and there was a municipal subsidy of $5,000. The operating statistics for the year ended June 30, 1913, showed:—Passenger earnings, $42,117; freight earnings, $69,137; gross earnings, including miscellaneous earnings, $111,932; Expenditure—maintenance of way and structures, $19,462; maintenance of equipment, $11,049; traffic and transportation expenses $43,589; general expenses, $4,996; total, $79,096. Passengers carried, 32,143; freight carried, 106,632 tons. Revenue train mileage, 124,042 miles. The company owned 3 passenger and 3 freight locomotives, 2 first class, 1 second class and 2 combination passenger cars; 1 baggage express and postal car; 6 box cars; 85 flat cars; 1 official car; 2 cabooses and 1 other company car.

The officers and staff of the line were:—President and General Manager, T. Malcolm; Secretary, A. B. McKnight; Purchasing Agent, E. H. Anderson; Car Accountant and Traffic Manager, A. A. Andrew; Freight and Passenger Agent, R. B. Humphrey, St. John, N.B.; Mechanical Superintendent, C. C. Johnson; Roadmaster, Jas. Bury; Storekeeper, G. McRae. With the exception specially mentioned, all these had their headquarters at Campbellton, N.B.

The line is now being operated as part of district 2, I.R.C., under the jurisdiction of Evan Price, Superintendent at Campbellton. Jas. Bury has been retained as Roadmaster, and C. C. Johnson, heretofore Mechanical Superintendent, has returned to his former position as locomotive driver. G. McRae, heretofore Storekeeper, has been given a location temporarily in the freight shed at Campbellton, and the others have retired from the service.

New Brunswick and P.E.I. Railway.

The N.B. and P.E.I. Ry. extends from Sackville, N.B., on the Intercolonial Ry., 38 miles east of Moncton, to Cape Tormentine, on Northumberland Strait, 36 miles. The predominant cause for its purchase is the approaching completion of the car ferry terminals at Cape Tormentine and at Carleton Point, P.E.I., between which will be operated a car ferry, to give rail connection between the I.R.C. and the P.E.I. Ry. The company was incorporated in 1873, and the line was completed and put in operation at the close of 1887. It was for some years practically owned by Hon. Josiah Wood, and was sold by him on his appointment as Lieutenant Governor of New Brunswick, in 1910, to C. W. Fawcett, a manufacturer at Sackville; M. G. Siddall, a farmer of Port Elgin, N.B., and the late T. D. Picard. The first board of directors consisted of:—President, C. W. Fawcett, Sackville; Manager and Treasurer, F. C. Harris, Sackville; C. Picard, M. G. Siddall, F. B. Black, H. E. Fawcett, H. M. Wood. The secretary was T. D. Picard, Sackville.

The financial statement at June 30, 1913, shows:—Capital stock, $214,850; bonds, $96,000; total, $310,850. The Dominion subsidy paid was $113,440; the New Brunswick subsidy, $99,708.90. The operating statistics for the year ended June 30, 1913, show:—Passenger earnings, $12,717; freight earnings, $30,636; gross earnings, including miscellaneous items, $43,394. Expenditures—maintenance of way and structures, $7,340; maintenance of equipment, $9,176; traffic and transportation expenses, $16,937; general expenses, $2,700; total, $36,153. Passengers carried, 22,292; freight carried, 49,793 tons; revenue train mileage, 56,810 miles. The company owned 3 locomotives, 2 second class and 1 combination passenger cars, 4 box cars, and 41 flat cars.

The line is in a poor physical condition, notwithstanding the fact that certain work was done on it during 1913 under the direction of Intercolonial officials. It has been decided to do a good deal of betterment work this year. A good deal of the right of way will have to be cleared up, as outside the actual track it is covered with a scrub growth. About 600 ties per mile of track will be put in, and about 18 miles will be relaid with 56 lb. rails, and a lift of ballast will be put on over the whole line. In a year of two the line will be relaid with heavier steel to provide for the increased traffic which will result from the operation of the car ferry.

The line is being operated as part of district 3, I.R.C., under J. T. Hallisey, Superintendent, with headquarters at Truro, N.S. F. C. Harris, who was Manager and Treasurer, is being retained as an agent in the meantime, reporting to Mr. Hallisey.

The Right Kind of Courage.

It is not our practice to refer in our reading columns to advertisements published in Canadian Railway and Marine World, and this is the first occasion in the history of the paper on which we have done so.

But we cannot omit to call special attention to the Northern Electric Company's advertisement which appears on page 444 of this issue.

It offers no goods, but it sounds the true note for all business men, "Stand Firm."

Everyone should read it and act on its advice.

Smoke Prosecution.—The C.P.R. was fined $5 and $2, at Ottawa, recently, for allowing black smoke to be emitted from its locomotive house smoke stack for periods varying from 10 to 37 minutes continuously. On behalf of the company, evidence was given to show that it was highly improbable such a thing could take place. Two minutes was the average time that dense smoke was emitted after coal had been placed on the fires. Notice of appeal was given.

Steel Specifications.—The American Society for Testing Materials has added to its specifications for reinforcing steel rolled from billets, an intermediate grade between the structural and hard grades. This new grade is to have a yield point of 40,000 lbs., and an ultimate tensile strength of from 70,000 to 85,000 lbs.

Grand Trunk Pacific Ry. Hotels.—In addition to the Fort Garry at Winnipeg, which is open, and the Macdonald, at Edmonton, and the Qu'Appelle, at Regina, which are approaching completion, the company contemplates erecting a large hotel at Prince Rupert and summer hotels in Jasper and Mt. Robson Parks.

The Granger Collieries, Ltd., is applying to the Alberta Legislature for authority to build an aerial wire rope tramway from its collieries on sec. 11, Tp. 24, range 10, west of the 5th meridian to the C.P.R., or to a spur line in sec. 13, in the same township and range, and to expropriate 100 ft. right of way.

The Canadian Northern Ry. Montreal staff has organized a rifle club, and has obtained a grant of rifles from the Militia Department. The number enrolled is, at present, 45, and shooting practice is had at the Longue Pointe ranges under qualified instructors.

A. E. Gough, Train Dispatcher, C.P.R., Farnham, Que., writes Canadian Railway and Marine World:—"Enclosed is money order for subscription to your valuable publication. I would not care to miss a number."

Mainly About Transportation People.

Lady MANN has returned to Toronto, after spending some months in Europe.

SIR WILLIAM MACKENZIE has given $10,000 to the Toronto and York Patriotic Fund.

SIR THOMAS SHAUGHNESSY spent part of the summer at his seaside residence, St. Andrews, N.B.

Mrs. F. B. MOFFITT, wife of the Canadian Passenger Agent, Delaware and Hudson Co., Montreal, died there, Aug. 5.

A. H. REID, son of the harbormaster at Vancouver, B.C., has been appointed to H.M.S. Hearty, in the British Navy.

ANGUS MACMURCHY, K.C., Local Solicitor, C.P.R., Toronto, who was in Europe when the war broke out, has returned home.

SIR WILLIAM MACKENZIE, President, Canadian Northern Ry., returned to Canada, early in August, from Great Britain.

SIR WILLIAM VAN HORNE, accompanied by his son, R. B. Van Horne, returned to Canada from Europe towards the end of July.

Mrs. R. C. VAUGHAN, wife of the Assistant to the Third Vice President, Canadian Northern Ry., returned to Toronto after a short visit to England.

H. L. DRAYTON, K. C., Chief Commissioner, Board of Railway Commissioners, arrived in London, England, with his wife and two daughters, on a visit.

A. E. COX, General Storekeeper, Canadian Northern Ry., Winnipeg, and Mrs. Cox, celebrated their silver wedding by a reception at their home, Aug. 8.

S. C. PETIT, stationer, Grand Trunk Pacific Ry., read a paper on the handling of stationery at the convention of the Railway Storekeepers' Association recently.

A. W. SMITHERS, Chairman, G. T. R., who was to have sailed from England, Aug. 1, for his annual trip of inspection over the system, cancelled the trip.

The marriage of Miss M. Wainwright, daughter of the late W. WAINWRIGHT, Vice President, G.T.R. and G.T. Pacific Ry., to R. D. Bell, took place at Montreal, Aug. 19.

A. D. CARTWRIGHT, Secretary, Board of Railway Commissioners, Ottawa, has recovered from his recent attack of ptomaine poisoning, and spent the summer vacation at Brackley Beach, P.E.I.

L. O. N. McPHERSON, formerly of the Land Department, C.P.R., has been appointed Manager in Great Britain of the Alberta Loan and Investment Co., which has its head office at Calgary.

D. B. DALY, who acted as a superintendent of construction on a contract for building the National Transcontinental Ry. east of the Quebec Bridge, died at Montreal, Aug. 9, after a very short illness.

Lady MACKENZIE presented pipes to the smokers among the recently recruited Princess Patricia Light Infantry, raised and equipped by H. Gault, Montreal, for service in the war.

R. Redmond, and Mrs. Redmond, daughter of SIR THOMAS SHAUGHNESSY, who were motoring in France at the outbreak of war, returned to London, without much difficulty.

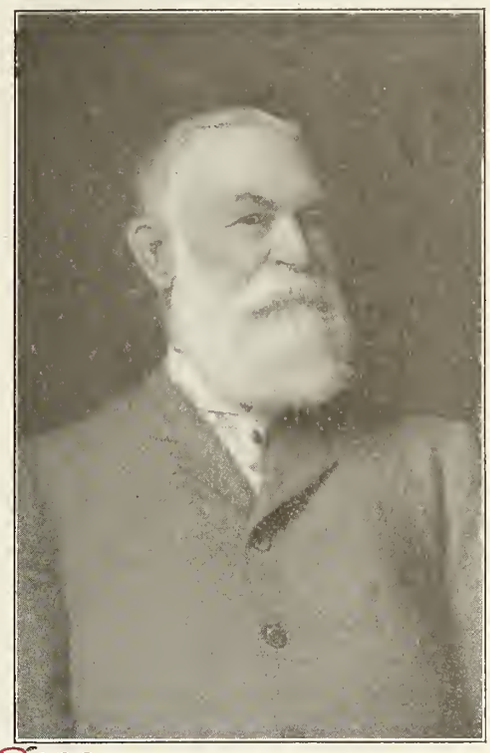
NORMAND R. DES BRISAY, whose appointment as General Travelling Passenger Agent, C.P.R., Montreal, with some biographical data, was given in our last issue, was born at Minneapolis, Minn., May 18, 1888.

A. BERNIER, K.C., Mayor of Levis, and intimately associated with The Levis Ferry, Ltd., who spent the summer in Europe, experienced considerable difficulty in returning to Great Britain, prior to embarking for Canada.

W. H. CLANCY, City Passenger and Ticket Agent, G.T.R., Montreal, who is on leave of absence, was on the Continent and is reported to have reached London, Aug. 21, via Paris and Boulogne. He is expected to sail for Canada Sept. 5.

DAVID B. MULLIGAN, who has been appointed General Superintendent, Grand Trunk Pacific Ry. Hotels, was at one time one of the lessees of the Russell House, Ottawa, and for the past three years was Manager of the Hotel Breslin, New York.

HUGH SUTHERLAND, Executive Agent, Canadian Northern Ry., Winnipeg, who was in Vienna at the end of July, is reported to have experienced considerable discomfort in returning to England, on account of the war troubles. He returned to Canada during August.



P392 J. D. Evans, M. Can. Soc. C.E.,
Division Engineer, Ottawa Division, Canadian Northern Railway.

JOHN S. GALBRAITH, S. Can. Soc. C. E., of Toronto, son of the late John Galbraith, Dean of the Faculty of Applied Science, University of Toronto, was married at Port Credit, Ont., July 28, to Miss Eileen Haney, youngest daughter of M. J. Haney, M. Can. Soc. C. E.

Miss J. Bosworth, sister of G. M. BOSWORTH, Vice President, C.P.R., has returned to Canada after a holiday on the continent. She was detained at Aix-les-Bains for some little time, until an automobile was arranged for to take her to Havre, whence she crossed to England.

A. L. HERTZBERG, M. Can. Soc. C.E., Division Engineer, C.P.R., Toronto, returned home early in August from a trip to Europe. He experienced considerable inconvenience in getting from the continent to England, where, with others, he had to wait for a vessel, owing to the disorganization of the trans-oceanic services.

Miss H. McNicoll, daughter of D. McNICOLL, Vice President, C.P.R., who was on a sketching tour in France, returned to London, Aug. 9, having been met at Valery-sur-Somme by a member of the C.P.R. London staff. She had left her heavy baggage at Longwy, and it was not deemed advisable to go for it.

ALLAN CAMERON, Superintendent, Land Branch, Department of Natural Resources, C.P.R., Calgary, Alta., who has been in Europe for a few weeks on business connected with his department, in company with E. Moore, of the same department, were in Christiania, Norway, during August, and sailed from England, for Canada, Aug. 28.

F. C. SALTER, European Manager, G.T. R. and Canadian Express Co., has received the thanks of a number of parties from both Canada and the United States for his personal efforts, and those of his staffs, for relief afforded in London during the period when it was practically impossible to obtain ready money in exchange for cheques, etc.

JOHN DEMPSTER, who died in England recently, was one of the founders of Elder, Dempster and Co., which later developed into a large shipowning and general mercantile business. The company, at one time, owned the Beaver Line, operating vessels between England and Canada, and which was subsequently acquired by the C.P.R.

H. L. DRAYTON, K.C., Chief Commissioner, Board of Railway Commissioners, who is spending the vacation in Great Britain, immediately on the outbreak of war, placed his services at the disposal of the acting High Commissioner in London, and has since rendered valuable service in connection with locating and caring for a number of Canadians, whose holidays in different parts of the continent were interfered with.

JOSEPH BILLINGHAM, who has been appointed Superintendent of Motive Power, G.T. Pacific Ry., Transcona, Man., was born in England and served his apprenticeship with the London and North Western Ry. He was afterwards Master Mechanic, Baltimore and Ohio Rd., and subsequently was appointed European Manager, Galena-Signal Oil Co., and later returned to the U.S. as Superintendent of Works, American Locomotive Co., Schenectady, N.Y.

JAMES A. YATES, Secretary, Montreal and Southern Counties Ry., who has also been appointed Assistant Treasurer, G.T.R. and G.T.P.R., Montreal, was born at Montreal, Nov. 30, 1876, and entered G.T.R. service in Feb., 1891, since when he has been, to Dec., 1906, clerk and insurance clerk, Treasurer's office, Montreal; Jan., 1907, to Dec., 1911, chief clerk, same department, G.T.P.R., Montreal; Jan., 1912, to July 31, 1914, chief clerk, same department, G.T.R. and G.T.P.R., Montreal.

GEORGE WILLIAM COBURN, whose appointment as Resident Engineer, C.P.R., Brandon, Man., was announced in our last issue, was born at Upper Melbourne, Que., June 24, 1877, and entered C.P.R. service in March, 1896, since when he has been, to Dec., 1900, rodman and draughtsman, Farnham, Que.; 1901 to 1907, draughtsman and Assistant District Engineer, Souris and Brandon, Man., and Moose Jaw, Sask.; 1907 to 1914, District Engineer and Resident Engineer, Souris and Brandon, Man.

WILLIAM CHESTER TOMKINS, who has been appointed Assistant to Vice President (Finance), G.T.R. and G.T.P.R., Montreal, was born at Montreal, May 19, 1871, and entered G.T.R. service Sept. 1, 1885, since when he has been, to May 13, 1887, in office of Auditor of Pay Rolls; May 14, 1887, to Sept. 1, 1888, in General Manager's

office; Sept. 1, 1888, to May 1, 1908, clerk in General Manager's and President's office, G.T.R. and G.T.P.R.; May 1, 1908, to Aug. 1, 1914, secretary to Vice President.

WALTER HARDMAN ARDLEY, who has been appointed Comptroller, G.T.R. and G. T.P.R., Montreal, and whose portrait appears in this issue, was born in London, England, Apr. 24, 1858, and entered G.T.R. service Nov. 5, 1884, since when he has been, to Nov. 1, 1893, clerk in General Auditor's office, Montreal; Nov. 1, 1893, to Dec. 31, 1907, chief clerk and general bookkeeper, Montreal; Dec. 31, 1907, to Aug. 31, 1908, Auditor of Disbursements, Montreal; Aug. 31 to Dec. 31, 1908, acting General Auditor, Montreal; Dec. 31, 1908, to Aug. 1, 1914, General Auditor, G.T.R. and G.T.P.R., Montreal.

At the laying of the corner stone of the Sir William Whyte school at Winnipeg, Aug. 18, the Principal of Manitoba College said that the name of the school would be a symbol to future generations who received their education there, of the heights to which industry can bring an aspiring man. When children heard the name they would be told the tale of SIR WILLIAM WHYTE and his remarkable rise from obscurity to a great position on the greatest railway corporation in the world, without the aid of a thorough education. The name and its associations would be an inspiration to young people.

WILLIAM NEWMAN, who died at Victoria, B.C., recently, aged 68, came to Canada in 1884, and was employed on construction work on the C.P.R. along the north shore of Lake Superior, and in 1886 he was transferred to British Columbia, at Donald, then a divisional point. In 1897 he was moved to Revelstoke and acted as Roadmaster over a considerable portion of the line, remaining there until 1905, when the C.P.R. took over the management of the Esquimalt and Nanaimo Ry., when he was appointed to the joint positions of Roadmaster and Bridge and Building Master. He retired from active service about a year ago.

FREDERICK C. JOHNSON, who was recently appointed Night Locomotive Foreman, C.P.R., Transcona, Man., was born at Montreal, Feb. 26, 1885, and entered railway service as an apprentice with the G.T.R., at Montreal and Belleville, Ont., after which he worked as machinist for various railways in Canada and the United States, from June, 1905, to June, 1910, since when he has been, to Sept., 1912, machinist, Canadian Northern Ry., Winnipeg; Sept., 1912, to Apr., 1913, machinist, C.P.R., Winnipeg; Apr. to Sept., 1913, Night Shop Foreman, C.P.R., Winnipeg; Sept., 1913, to May, 1914, Day Shop Foreman, C.P.R., Winnipeg.

JAMES ALEXANDER MACGREGOR, who has been appointed Superintendent, District , Alberta Division, C.P.R., Edmonton, was born at Dufftown, Scotland, Apr. 5, 1873, and entered C.P.R. service, May, 1892, since when he has been, to Feb., 1903, clerk, stenographer, chief statistical clerk and Travelling Car Agent, Montreal; Feb., 1903, to June, 1904, Car Service Agent, Winnipeg; June, 1904, to Oct., 1908, Assistant Superintendent Car Service, Winnipeg; Oct., 1908, to Oct., 1909, Superintendent, Souris, Man.; Nov., 1909, to Sept., 1913, Superintendent, Brandon, Man.; Sept., 1913, to July, 1914, Relieving Superintendent on various divisions.

JAMES RAMSAY WATSON, whose appointment as Assistant Superintendent, Sleeping, Dining and Parlor Cars and News Service, Eastern Lines, C.P.R., Montreal, was announced in our last issue, was born at Morpeth, Northumberland, England, Feb. 8, 1873, and entered C.P.R. service June, 1903, since when he has been, to June, 1907, dining car steward, Montreal; June to Aug., 1907, dining car inspector, Glen Yards, Montreal; Aug., 1907, to July, 1914, consecutively, Travelling Dining Car Inspector, Eastern Lines; Travelling Dining Car Inspector, Western Lines; Terminal Inspector, Winnipeg; and Inspector, London Office, London, Eng.

ARTHUR JOHN HILLS, whose appointment as General Superintendent, Ontario Division, Canadian Northern Ry., Toronto, was announced in our last issue, was born at Toronto, Feb. 15, 1879, and entered Canadian Northern Ay. service, Apr., 1899, since when he has been, to June, 1901, Stores and Material Agent, Construction Department in Manitoba; June, 1901, to Dec., 1903, clerk, General Superintendent's office, Winnipeg; Dec., 1903, to Jan., 1908, in Third Vice President's office, Toronto; Jan., 1908, to July, 1914, Superintendent, C.N. Ontario Ry., Toronto. He was educated at Ridley College, St. Catharines, Ont., Upper Canada College, Toronto, and the University of Toronto.

P 393 S. R. Payne,
General Manager, Ottawa and New York Railway.

M. G. HURD, whose appointment as Chief Dispatcher and Trainmaster, District 4, Western Division, Canadian Northern Ry., Calgary, Alta., was announced in our last issue, was born in Toronto, and entered railway service in 1881 as operator, Georgia Pacific Ry., Atlanta, Ga., and subsequently served as agent, operator and dispatcher on various U.S. railways, until June 1, 1910, since when he has been, to Sept. 1, 1910, dispatcher at Port Arthur and Rainy River, Ont., consecutively, Canadian Northern Ry.; Sept. 1, 1910, to Nov. 5, 1913, dispatcher, C.N.R., Saskatoon, Sask.; Nov. 5, 1913, to July 5, 1914, Chief Dispatcher, District 2, Western Division, C.N.R., Saskatoon, Sask.

GERALD HIAM, who has been appointed District Freight Agent, C.P.R., Fort William, Ont., was born at Montreal, Dec. 14, 1888, and entered railway service in June, 1904, since when he has been, to June, 1905, junior clerk, C.P.R., Montreal; June, 1905, to Apr., 1907, stenographer, C.P.R., Montreal; Apr., 1907, to Jan., 1908, on survey, Canadian Northern Ry., St. Jerome, Que.; Jan. to July, 1908, stenographer, Cuba Rd., Canaguey, Cuba; July to Sept., 1908, stenographer, C.N. Ontario Ry., Toronto; Sept., 1908, to May, 1910, stenographer, C.P.R., Montreal; May, 1910, to Jan., 1914, clerk in Tariff Bureau, C.P.R., Montreal; Jan. to July, 1914, Travelling Freight Agent, C.P.R., Toronto.

A. CATTONI, Agent, C.P.R., Paris, France, earned the thanks of many Canadians and others, during the early part of August, for services rendered to those who were more or less stranded there, owing to the banks there declining to cash cheques on London. Hearing that the French post offices were cashing postal orders up to 1,000 francs he wired the Dominion Express Co. in England to send him postal orders, and so obtained money to meet emergencies. Arrangements were then made with Canadians that they could draw individually up to $20 a day for personal expenses, and if they wished to leave France money was provided for travelling expenses, with a margin in case they were delayed at the coast.

KNOWLSON ELLIOTT, who has been appointed City Freight Agent, C.P.R., Calgary, Alta., was born at Gorrie, Ont., June 26, 1884, and entered railway service in Jan., 1903, since when he has been, to Oct., 1905, car checker, Michigan Central Rd., Jackson, Mich.; Nov., 1905, to Jan., 1909, clerk, Local Freight Department, C.P.R., Winnipeg; Jan. to Oct., 1909, rate clerk, General Freight Department, C.P.R., Winnipeg; Oct., 1909, to June, 1911, Soliciting Freight Agent, Minneapolis, St. Paul and Sault Ste. Marie Ry., Winnipeg; June, 1911, to July 1, 1912, Soliciting Freight Agent, C.P.R., Winnipeg; July 1 to Dec. 31, 1912, chief clerk, Division Freight Agent, C.P.R., Winnipeg; Jan. 1, 1913, to July 1, 1914, chief clerk to Assistant Freight Traffic Manager and General Freight Agent, C.P.R., Winnipeg.

GEORGE COLLINS, whose appointment as Superintendent, Ottawa Division, Canadian Northern Ry., Trenton, Ont., was announced in our last issue, was born at Carrying Place, near Trenton, Ont., July 20, 1860, and entered railway service, June 1, 1882, since when he has been, to May, 1884, timekeeper, Central Ontario Ry., Trenton; May, 1884, to May, 1890, agent, same company; May, 1890, to May, 1892, dispatcher, same company; May, 1892, to May, 1894, Secretary-Treasurer and Assistant Superintendent, same company; Apr., 1894, to Oct., 1902, General Superintendent and Secretary, same company; Oct., 1902, to Dec., 1906, Receiver and Manager, same company; Dec., 1906, to July, 1914, General Manager and Secretary, same company; May, 1903, to July, 1914, also director, and from Mar., 1910, also General Manager, Irondale, Bancroft and Ottawa Ry.

JOHN C. O'DONNELL, whose appointment as Superintendent, District 3, Western Division, Canadian Northern Ry., Edmonton, Alta., was announced in our last issue, was born at Cobden, Ont., Dec. 17, 1879, and entered railway service, Sept. 15, 1899, since when he has been, to Sept. 1, 1901, freight brakeman, C.P.R., Chapleau, Ont.; Sept. 1, 1901, to May 1, 1902, freight conductor, C.P.R., Chapleau, Ont.; June 10, 1902, to May 1, 1905, brakeman and conductor, C.P.R., Cranbrook, B.C.; May 5 to July 2, 1905, brakeman, Canadian Northern Ry., Kamsack, Sask.; July 2, 1905, to Nov. 1, 1909, conductor, C.N.R., North Battleford, Sask.; Nov. 1, 1909, to Feb. 20, 1911, Trainmaster, C. N. R., Dauphin, Man.; Feb. 20, 1911, to June 30, 1912, Trainmaster, C. N. R., Winnipeg, Man.; July 1, 1912, to July 1, 1914, Trainmaster, C.N.R., Rainy River, Ont.

THOMAS TURNBULL, whose appointment as Assistant Chief Engineer, Canadian

Northern Ry., Winnipeg, was announced in our last issue, was, from 1881 to 1889, transitman on location and Resident Engineer on construction on various parts of the C.P.R.; 1889 to 1891, with Newfoundland Government, in charge of location party and construction work on Halls Bay railway; 1891 to 1897, Assistant Engineer Maintenance and Construction, Western Division, C.P.R.; 1897 to 1900, Chief Engineer, west of Winnipeg, Canadian Northern Ry.; 1900 to 1901, on contract work bridging on C. N.R.; 1901 to 1902, reconnaissance work for Dominion Government; 1902 to 1904, inspecting surveys for Dominion Government; 1904 to 1910, Assistant Chief Engineer, C. N.R.; 1910 to 1912, Assistant Chief Engineer, Hudson Bay Railway; 1912 to 1913, Chief Engineer, Edmonton, Dunvegan and British Columbia Ry.

JAMES FREDERICK GILDEA, who has been appointed District Master Mechanic, C.P.R., Montreal, and whose portrait appears in this issue, was born at Strood Park, near Horsham, Sussex, England, July 7, 1884, and educated at Bromsgrove School, Worcestershire. He entered railway service in June, 1900, since when he has been, to June, 1904, engineering apprentice, London and South Western Ry., Nine Elm Works, London, Eng., at the conclusion of which he was presented by the directors with a special prize for the highest place in the apprentices' technical examinations, with 100%; June, 1904, to June, 1905, fireman, all classes of service, L. & S.W.R., Salisbury, Eng.; June, 1905, to Jan., 1906, on engineering staff, Southampton Docks and R.M.S. Alberta, L. & S.W.R., Southampton, Eng.; Jan. to June, 1906, locomotive draughtsman, L. & S.W.R., Nine Elm Works, L. &. S.W.R., London, Eng.; June, 1906, to Jan., 1907, supervising locomotive statistics and operation, L. & S.W.R., Nine Elm Works, London, Eng.; Feb., 1907, to Mar., 1908, fitter, Angus Shops, C.P.R., Montreal; Mar. to Oct., 1908, in tests department, Angus Shops, C.P.R., Montreal; Oct., 1908, to July, 1909, Assistant Locomotive Foreman, C.P.R., North Bay, Ont.; Aug., 1909, Assistant Locomotive Foreman, C.P.R., Chapleau, Ont.; Sept., 1909, to Sept., 1912, Locomotive Foreman, C.P.R., Schreiber, Ont.; Sept., 1912, to July, 1914, Locomotive Foreman, C.P.R., Hochelaga, Que.

JOHN NIBLOCK, who died at Victoria, B.C., July 30, was born at Scarborough, York County, Ont., Dec. 21, 1849, and entered railway service as switchman on the G.T.R., Aug. 21, 1870. He served two years as brakeman and two years as conductor, when he resigned to go into the fruit and ornamental tree business, where he remained for five years. In 1880 he entered the Dominion Government railway service on the original C.P.R. as conductor, and as such, made the first crossing of the Louise Bridge at Winnipeg in Aug., 1880, and ran the first train between Winnipeg and Portage la Prairie, Dec. 1, 1880. He entered the C.P.R. service on its inception in 1881, as conductor, and was appointed Trainmaster, Sept. 9, 1882, and Superintendent, Port Arthur-Winnipeg Section, Sept. 14, 1883. On May 21, 1887, he was transferred to Medicine Hat, Alta., as Superintendent, and in Oct., 1899, was transferred to Calgary, Alta., in a similar capacity, where he remained until Nov. 1, 1909, when he retired from active railway work. During his superintendency west of Winnipeg he assisted in the building of about 1,000 miles of line. He will always be remembered as the founder of the Medicine Hat General Hospital, which proved a great blessing in the earlier days of settlement when there was no other hospital on the line of railway west of Winnipeg, and to which he contributed liberally, personally, and raised a considerable sum by persistent personal exertion. He has been interested in fruit growing in the Okanagan Valley for several years, and since his retirement from railway service spent most of his time there. The funeral took place at Calgary, Alta.

Railway Rolling Stock Notes.

The C.P.R. has ordered two all steel mail cars from its Angus Shops.

The Prince Edward Island Ry. is reported to have received three passenger cars and one baggage car, from Moncton, N. B.

The Crossen Car Co. has ordered 7 steel frames and trucks for tourist cars from the Canadian Car and Foundry Co.

The Pacific Great Eastern Ry. has received two consolidation locomotives from the Canadian Locomotive Co.

Baldry, Yerburgh and Hutchinson, contractors on the Welland Ship Canal, have received two 6 wheel saddle tank locomotives from the Canadian Locomotive Co.

P394 J. F. Gildea,
Master Mechanic, District 2, Eastern Division, Canadian Pacific Railway.

The G. T. R. has received 10 suburban cars and one suburban second class and baggage car, from the Canadian Car and Foundry Co., and 7 first class cars from the Osgood Bradley Car Co.

The C.P.R., between July 15 and Aug. 15, received the following additions to rolling stock from its Angus Shops:—110 steel frame box cars, 7 steel colonist cars and 40 refrigerator cars.

The Intercolonial Ry. has received 5 express refrigerator cars from its Moncton shops, and 35 box cars, 80,000 lbs. capacity, completing an order for 180, from Canadian Car and Foundry Co.

During 1913, the C.P.R. built 81 locomotives in its shops, standing second in a list of all railways building their own locomotives on the American continent. The Pennsylvania Rd. built 179 in its shops.

The International Ry. of New Brunswick's official car, heretofore used by T. Malcolm, President, has been assigned for use by Evan Price, Superintendent, Intercolonial Ry., Campbellton, N.B., under whose jurisdiction the International Ry. has been placed since its purchase by the Dominion Government recently.

The Canadian Northern Ry., between July 14 and Aug. 15, received the following additions to rolling stock:—9 colonist cars from Canadian Car and Foundry Co.; 5 colonist cars from Crossen Car Co.; 5 baggage cars from Preston Car and Coach Co.; and 3 locomotives from Canadian Allis-Chalmers, Ltd.

The Canadian Car and Foundry Co., during July, delivered the following stock,—83 underframes and trucks for 40 ton tank cars, and 10 underframes and trucks for 30 ton tank cars, for Imperial Oil Co.; 11 steel frame suburban cars, and 3 steel frame combination baggage and suburban cars, for G. T. R.; 10 wooden colonist cars, for Canadian Northern Ry., and 80 steel frame box cars, 40 tons capacity, for Intercolonial Ry.

Following are chief details of the six class 464 locomotives, which the G.T.R. has ordered from the Montreal Locomotive Works, for suburban service, as mentioned in our last issue:—

Cylinder, diar. and stroke	21 by 26 ins.
Tractive power	30,940 lbs.
Factor of adhesion	4.53
Wheel base, driving	15 ft. 8 ins.
Wheel base, total	39 ft. 4½ ins.
Weight in working order	250,000 lbs.
Weight on drivers	139,500 lbs.
Weight on trailer	59,000 lbs.
Weight on engine truck	51,500 lbs.
Boiler, type	Straight
Boiler, diar. first ring	71 9-16 ins.
Boiler, pressure	200 lbs.
Firebox, length and width	129⅛ by 75¼ ins.
Crown staying	Radial
Tubes, no. and diar.	191 2 ins.; 26 5¾ ins.
Tubes, length	11 ft. 10 ins.
Heating surface, tubes and flues	1,604 sq. ft.
Heating surface, firebox and arch tubes	204 sq. ft.
Heating surface, total	1,808 sq. ft.
Superheating surface	3,532 sq. ft.
Grate area	47 sq. ft.
Driving wheels, diar.	63 ins.
Other wheels, diar.	31 ins.
Driving journals, main	9½ by 20 ins.
Driving journals, others	9½ by 12 ins.
Engine truck journals	6½ by 10½ ins.
Trailing truck journals	6 by 11 ins.
Journal boxes	Cast steel
Air brakes	Westinghouse American
Tank, type	Water bottom
Tank capacity, water	3,500 U. S. gals.
Tank capacity, coal	5 tons

Central Ry. of Canada and its Contractors.—The judgment of the Imperial Privy Council in the case of Wills and Sons against the Central Ry. of Canada was announced in London, Eng., Aug. 5. The company entered into a general contract for the building of a line from Montreal to Georgian Bay, and work was started from near Hawkesbury, Ont., in the direction of Montreal. Subsequently the company became involved in difficulties of various kinds, and the contractors claimed that the company had broken the contract by not making payments at the times fixed in the contract as the work progressed. The company, on the other hand, claimed that the contractors had failed to prosecute the work with due diligence and proceeded to let other contracts, and the contractors sought an injunction to prevent this. The Privy Council dismissed the appeal of the contractors, which sought to set aside the finding of Court of Appeals which set aside the injunction obtained in the lower courts restraining the company from letting construction work to any other firm than the plaintiffs. The suits for damages on either side which were brought were not involved in the appeal, having been arrived at in the course of the hearings.

The Intercolonial Ry. elevator at St John, N. B., with 750,000 bush. of grain, was burnt, Aug. 13. A freight shed, train shed and three freight cars were also burnt.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canadian Government Railways.—The jurisdiction of the general officers has been extended over the International Ry. of New Brunswick and the New Brunswick and Prince Edward Island Ry., which have been purchased by the Government.

The International Ry. of New Brunswick is now part of district 2, I.R.C., under Evan Price, Superintendent, Campbellton, N.B.

The New Brunswick and Prince Edward Island Ry. is now part of district 3, I.R.C., under J. T. Hallisey, Superintendent, Truro, N.S.

CAMPBELL R. MacKENZIE has been appointed General Superintendents' Accountant, to inspect superintendents' accounting, advise and instruct their accountants as far as schedules are concerned, check up accounting, time keeping, etc., in the superintendents' accounting offices and bring about uniform work. Office, Moncton, N.B.

See also Intercolonial Ry., International Ry. of New Brunswick, New Brunswick and P.E.I. Ry.

Canadian Northern Ry.—S. McELROY, heretofore conductor, has been appointed Trainmaster, District 1, Central Division, vice J. C. O'Donnell, appointed Superintendent at Edmonton, Alta., as announced in our last issue. Office, Rainy River, Ont.

G. A. KEELER has been appointed Resident Manager, Prince Edward Hotel, Brandon, Man.

E. R. CUNNINGHAM has been appointed Passenger Agent, Prince Albert, Sask., vice J. H. Norton, promoted.

J. H. NORTON, heretofore Passenger Agent, Prince Albert, Sask., has been appointed City Ticket Agent, Calgary, Alta.

Canadian Pacific Ry.—C. POWERS, heretofore District Master Mechanic, District 3, Eastern Division, Montreal, has been appointed District Master Mechanic, District 1, Atlantic Division, vice D. L. Jones, transferred to Eastern Division. Office, Brownville Jct., Me.

J. H. DUFF, heretofore Assistant Superintendent, District 3, Eastern Division, Montreal, has been appointed Chief Dispatcher, Farnham, Que.

C. W. LOTT, heretofore Assistant Superintendent, Chapleau, Ont., has been appointed Assistant Superintendent, District 3, Eastern Division, vice J. H. Duff, Office, Montreal.

F. NOWELL, heretofore District Master Mechanic, District 2, Eastern Division, has been appointed District Master Mechanic, District 3, Eastern Division, vice C. Powers, transferred to Atlantic Division. Office, Montreal.

J. F. GILDEA, heretofore Locomotive Foreman, Hochelaga, Que., has been appointed District Master Mechanic, District 2, Eastern Division, vice F. Nowell, transferred. Office, Montreal.

W. H. PEARSON, heretofore General Foreman, Wood, Freight and Steel Car Shops, Montreal, has, on account of ill health, been relieved, and assigned to the position of Assistant General Foreman, Wood Freight Car Shop, vice P. A. Crysler, resigned.

M. D. BOMHOWER, heretofore Assistant General Foreman, Passenger Car Shops, Montreal, has been appointed General Foreman, Wood, Freight and Steel Car Shops, vice W. H. Pearson, relieved on account of ill health.

W. FORREST, heretofore Car Foreman, London, Ont., has been appointed Assistant M.C.B. Inspector, Eastern Lines, Montreal.

W. C. MAYO, heretofore Locomotive Foreman, Port McNicoll, Ont., has been appointed Locomotive Foreman, Trenton, Ont. This is a new position.

JOHN TREGASKIS, heretofore Assistant Foreman, Lambton, Ont., has been appointed acting Locomotive Foreman, Trenton, Ont., vice W. C. Mayo, on leave of absence. He will also relieve C. Wheeler, Locomotive Foreman, Muskoka, Ont.

W. WALSH, heretofore wrecking foreman, Lambton, Ont., has been appointed Car Foreman, Trenton, Ont.

A. FROST, heretofore Roadmaster, Orangeville, Ont., has been appointed Roadmaster, West Toronto.

F. RONALDSON, heretofore Locomotive Foreman, Lambton, Ont., has been appointed acting District Master Mechanic, relieving District Master Mechanics in the division, who are on vacation.

J. BANNON, heretofore Car Foreman, Lambton, Ont., has been appointed Car Foreman, West Toronto, Ont., vice J. Cowley, transferred.

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Frank Scott,
Vice President and Treasurer, Grand Trunk Railway and Grand Trunk Pacific Railway.

S. ILLINGSWORTH, heretofore Night Locomotive Foreman, has been appointed Locomotive Foreman, Lambton, Ont., vice F. Ronaldson, promoted.

G. MURPHY, heretofore Assistant Foreman, has been appointed Night Locomotive Foreman, Lambton, Ont., vice S. Illingsworth, promoted.

J. E. HUGHES, heretofore Car Foreman, North Bay, Ont., has been appointed Car Foreman, Lambton, Ont., vice J. Bannon, transferred.

C. T. RIDALLS, heretofore Car Foreman, McAdam Jct., N.B., has been appointed Car Foreman, London, Ont., vice W. Forrest, transferred to the Master Car Builder's staff at Montreal.

J. WRIGHT, heretofore Assistant Locomotive Foreman, Havelock, Ont., has been appointed Locomotive Foreman, Port McNicoll, Ont., vice W. C. Mayo, transferred.

J. GOODMAN, heretofore section foreman and extra gang foreman, Muskoka Subdivision, has been appointed Roadmaster, Orangeville, Ont., vice A. Frost, transferred.

H. H. THOMAS has been appointed Car Foreman, Schreiber, Ont., vice E. F. Mascoe, transferred.

W. SHEPHERD has been appointed Car Foreman, North Bay, Ont.

J. COWLEY, heretofore Car Foreman, West Toronto, Ont., has been appointed Car Foreman, North Bay, Ont., vice J. E. Hughes, transferred.

GERALD HIAM, heretofore Travelling Freight Agent, Toronto, has been appointed District Freight Agent, Fort William, Ont., vice Carl Morse, transferred, as reported in our last issue.

The Alberta Division has been divided into five districts, as follows:—

District 1, comprising Medicine Hat, Calgary, Empress, Bassano, Suffield, Langdon, Irricana and Gleichen Subdivisions. J. M. CAMERON, Superintendent, Medicine Hat.

District 2, comprising Lethbridge, including Dunmore Terminal, Crowsnest, Aldersyde, Macleod, Coutts, Cardston, Woolford and Foremost Subdivisions. F. WALKER, Superintendent, Lethbridge.

District 3, comprising Calgary Terminals, Laggan and Red Deer Subdivisions. P. F. WEISBROD, Superintendent, Calgary.

District 4, comprising Edmonton, including Red Deer Terminal, Hardisty, Lacombe, Coronation and Alberta Central Subdivisions. J. A. MacGREGOR, Superintendent, Edmonton.

District 5, comprising Cranbrook, including Crowsnest Terminal, Sirdar, Kingsgate, Kimberley, Waldo and Fort Steele Subdivisions. A. C. HARSHAW, Superintendent, Cranbrook, B.C.

A. F. HAWKINS, heretofore General Yardmaster, Fort William, Ont., has been appointed Trainmaster, District 1, Alberta Division, vice J. M. McArthur. Office, Medicine Hat.

W. J. MANLEY, heretofore Chief Dispatcher, Macleod, Alta., has been appointed Chief Dispatcher, Lethbridge, Alta.

E. B. SKEELS, heretofore Resident Engineer, Calgary, Alta., has been appointed Resident Engineer, Lethbridge, Alta.

W. McKINTY, heretofore Bridge and Building Master, Cranbrook, B.C., has been appointed Bridge and Building Master, Lethbridge, Alta.

E. J. LEMIEUX, heretofore Roadmaster, Medicine Hat, Alta., has been appointed District Master Mechanic, Lethbridge, Alta.

W. J. RENNIX, heretofore District Master Mechanic, Cranbrook, B.C., has been appointed District Master Mechanic, Calgary, Alta., vice G. Glasford, transferred.

J. M. MacARTHUR, heretofore Trainmaster, Medicine Hat, Alta., has been appointed Terminal Trainmaster, Calgary, Alta., vice A. N. Hobkirk, on leave of absence.

C. E. MANSFIELD has been appointed Chief Dispatcher, Calgary, Alta.

W. S. HALL, heretofore Yardmaster, Cranbrook, B.C., has been appointed Trainmaster, District 4, Alberta Division. Office, Red Deer.

A. J. IRONSIDES, heretofore District Master Mechanic, Saskatoon, Sask., has been appointed District Master Mechanic, District 4, Alberta Division. Office, Edmonton.

H. MARSHALL, heretofore Bridge and Building Master, Saskatoon, Sask., has been appointed Bridge and Building Master, District 4, Alberta Division. Office, Edmonton.

C. W. FISHER, heretofore Trainmaster, Edmonton, Alta., has been appointed Chief Dispatcher, District 4, Alberta Division. Office, Edmonton.

C. FLINT has been appointed Resident

Engineer, District 4, Alberta Division. Office, Edmonton.

T. J. BROWN, heretofore Resident Engineer, Cranbrook, B.C., has been appointed Resident Engineer and Bridge and Building Master there, vice W. McKinty, Bridge and Building Master, transferred.

G. GLASFORD, heretofore District Master Mechanic, Calgary, Alta., has been appointed District Master Mechanic, Cranbrook, B.C., vice W. J. Rennix, transferred.

W. E. CLINE has been appointed Chief Dispatcher, Cranbrook, B.C.

NELSON FLEMING, heretofore Travelling Freight Agent, Portland, Ore., has been appointed District Freight Agent, Tacoma, Wash., vice O. H. Becker, transferred.

O. H. BECKER, heretofore District Freight Agent, Tacoma, Wash., has been appointed District Freight Agent, Portland, Ore., vice E. L. Cardle, resigned.

Grand Trunk Pacific Ry. — FRANK SCOTT, Vice President and Treasurer, G. T.R., has also been appointed Vice President and Treasurer, G.T.P.R. Office, Montreal.

W. H. ARDLEY, Comptroller, G.T.R., has also been appointed Comptroller, G.T.P.R Office, Montreal.

JAMES A. YATES has been appointed Assistant Treasurer. Office, Montreal.

G. R. MARTIN has been appointed Assistant Auditor of Disbursements. Office, Montreal.

JOSEPH BILLINGHAM, formerly Superintendent of Works, American Locomotive Co., Schenectady, N.Y., has been appointed Superintendent of Motive Power, G.T.P.R vice G. W. Robb, resigned. Office, Transcona, Man.

A. J. ROBERTS, heretofore Locomotive Foreman, Edson, Alta., has been appointed Locomotive Foreman, Transcona, Man., vice A. J. Bell, resigned.

D. B. MULLIGAN has been appointed General Superintendent of the company's hotels, vice F. W. Bergman, resigned. The hotels include the Fort Garry, at Winnipeg, which is operation, and the Macdonald, at Edmonton, and the Qu'Appelle, at Regina, which are approaching completion. Office, Winnipeg.

The following station agents have been appointed:—Loverna, Sask., R. W. Stockdale; Zelma, Sask., C. W. Collicutt; Coalspur, Alta., J. O'Leary.

Grand Trunk Ry.—Owing to the death of M. M. REYNOLDS, Vice President, in charge of Finance and Accounting, that position has been abolished.

FRANK SCOTT, heretofore Treasurer, has been appointed Vice President and Treasurer, in charge of all finance of the company, reporting to the President. Office, Montreal.

W. H. ARDLEY, heretofore General Auditor, has been appointed Comptroller in charge of all accounting of the company. reporting to the President. Office, Montreal.

W. C. TOMKINS, heretofore secretary to Vice President (Finance), has been appointed Assistant to Vice President and Treasurer. Office, Montreal.

JAMES A. YATES has been appointed Assistant Treasurer. Office, Montreal.

G. R. MARTIN has been appointed Assistant Auditor of Disbursements. Office, Montreal.

E. R. BATTLEY, heretofore Locomotive Foreman, Fort Erie, Ont., has been appointed General Foreman, supervising Motive Power Department work at Portland Terminals, Me., vice Jas. Gibson, resigned, as reported in our last issue. The position of Assistant Master Mechanic there has been abolished.

D. ROSS, heretofore Locomotive Foreman, Coteau, Que., has been appointed Locomotive Foreman, Southwark Terminals, Montreal, vice G. W. Clark, assigned to other duties.

F. W. WARREN has been appointed Locomotive Foreman, Coteau, Que., vice D. Ross, assigned to other duties.

J. B. DUNLOP has been appointed Locomotive Foreman, Fort Erie, Ont., vice E. R. BATTLEY, promoted, as reported in our last issue.

J. E. D'ALTON, heretofore Soliciting Freight Agent, New York, has been appointed Travelling Freight Agent there, vice H. H. Hammell.

The following station agents have been appointed:—St. Agapit, Que., J. A. Provencher; Millbrook Jct., Ont., W. T. Byam; Stoney Point, Ont., R. Wilkinson; Humberstone, Ont., R. A. Starling; Norwich, Ont., H. C. Elder; Tara, Ont., C. Dopfer; Shallow Lake, Ont., L. K. Fox; outside agencies:—Perth, Ont., H. C. Stone; Smiths Falls, Ont., J. E. Burns.

Intercolonial Ry.—J. C. FULMORE, heretofore Roadmaster, Point Tupper to Sydney, Sydney, N.S., has been appointed Roadmaster, Truro, N.S., to Painsec Jct., N.B., vice G. Cooper, who returns to the position of section foreman at Shediac, N.B. Headquarters, Truro, N.S.

JAMES BURY, heretofore Roadmaster, International Ry. of New Brunswick, Campbellton, N.B., has been appointed Roadmaster, International Branch, District 2, I.R.C., between Campbellton and St. Leonards. Office, Campbellton, N.B.

International Railway of New Brunswick.—The Canadian Government Railways, having taken over this line, the jurisdiction of the general officials of the C.G. Rys. has been extended over it. The positions heretofore held by E. H. Anderson, Manager and Purchasing Agent; A. A. Andrew, Traffic Manager; C. C. Johnson, Mechanical Superintendent; G. McRae, Storekeeper, Campbellton, and B. H. Humphrey, Freight and Passenger Agent, St. John, have been abolished. James Bury, Roadmaster, Campbellton, has been retained in the Intercolonial Ry. service, in charge of the International Branch, as the International Ry. is now called. It is under the jurisdiction of E. Price, Superintendent, District 2, I.R.C.

New Brunswick and Prince Edward Island Ry.—The Canadian Government Railways, having taken over this line, its officers will report to the C.G.R. general officers at Moncton, N.B.

F. C. HARRIS, heretofore Manager and Treasurer, Sackville, N.B., is acting as agent, reporting to J. T. Hallisey, Truro, N. S., Superintendent, District 3, I.R.C., to which the N.B. and P.E.I. has been attached.

(See also Canadian Government Railways.)

Northern Pacific Ry.—D. C. PETTIBONE has been appointed General Baggage Agent. Office, St. Paul, Minn.

Oregon-Washington Rd. and Navigation Co.—J. H. CUNNINGHAM has been appointed Travelling Freight and Passenger Agent, Vancouver, B.C., vice A. E. D. Stewart, reporting to the Assistant Traffic Manager, Seattle, Wash.

Union Stock Yards, Ltd.—A. M. LAMBERT has been appointed Secretary-Treasurer, vice W. Sanford Evans, resigned, owing to press of other business.

Motor Omnibus Matters.

The Vancouver, B. C., and the Hamilton, Ont., city councils have under consideration propositions for the operation of motor bus services.

Bodies for a number of motor driven vehicles to be operated in Edmonton, Alberta, have been built by the Preston Car and Coach Co. They have a capacity of 26 passengers each. The same company is also building a number of bodies for Robins, Ltd., Toronto.

Motor Omnibus for Service in Edmonton, Alta.

The Stratford, Ont., City Council has authorized the running of a motor bus service in the city. It is proposed to adopt the p.a.y.e. type of sightseeing cars for the service. A service has already been put in operation with another type of car by N. R. Thompson.

The Toronto City Council proposes to ask the ratepayers to vote on a by-law providing $150,000 for the purchase and equipment of motor vehicles for transporting passengers in the city. The vote will not be taken until Jan. 1. A motion authorizing the council to hire a number of motor busses to experiment with prior to the going into the business definitely, was rejected.

The Winnipeg Works and Property Committee which was considering a proposed bylaw to grant a motor bus franchise in the city, threw out the section giving an exclusive franchise, and the company's representatives withdrew. At a subsequent meeting, Aug. 15, the committee decided by five to three to recommend the adoption of the exclusive clause in the proposed franchise. A. J. Andrews, K.C., represented the company, which is a British one.

Electric Railway Department

Judgment in the Vancouver Bridges Case.

As stated in our August issue, the Judicial Committee of the Privy Council gave judgment June 26 in the case of the British Columbia Electric Ry. vs. the Vancouver, Victoria & Eastern Ry. and Navigation Co. et al. As the judgment, which was delivered by Lord Sumner, is of great importance to electric railway companies generally it is given in full as follows:—

The appellant, the B. C. Electric Ry. Co. (referred to herein as the "Tramway Company"), is a company operating street railways in the City of Vancouver under powers conferred upon it by an act of the British Columbia Legislature. Its railways are local street railways wholly situated within the province of British Columbia, and have not been declared to be for the general advantage of Canada or for the advantages of two or more provinces, so that they have not passed into the domain of legislation of the Dominion Parliament.

The respondent, the Vancouver, Victoria and Eastern Ry. and Navigation Co. (referred to herein as the "Railway Company"), is a company owniug and operating a railway which has been declared to be a work for the general advantage of Canada. It is therefore under Dominion legislatiou. Its tracks run through the City of Vancouver, of which the other respondent (hereinafter referred to as the "Corporation") is the municipal authority.

The litigation out of which the present appeal arises relates to a portion of the track of the railway which runs along the bottom of a valley with somewhat deep sides, the general direction of which is north and south. That valley is included within the limits of the City of Vancouver, and streets run across and along it, but owing to the inequality of the levels there has been but little building along those streets. One street, Raymur Ave., runs along the valley parallel to the railway track and near to it. Four streets, whose direction is east and west, cross Raymur Ave. and the railway track at right angles. These streets are Hastings, Pender, Keefer, and Harris. Tracks of the tramway company pass along Hastings and Harris Streets, and cross the tracks of the railway company by level crossings.

For some time prior to July, 1912, the corporation had under consideration a plan for carrying the four streets above referred to across the railway track on viaducts, so as to avoid the gradients due to the low level of the railway track. Owing to its not having decided whether or not it should adopt this plan, it had been unable to grant any of the numerous applications which had been made to it for building permits along those streets, inasmuch as the grades of the streets could not be determined. Early in 1912, however, it passed a bylaw authorizing the construction of these four viaducts. Such a bylaw required the assent of the citizens to give it validity, and on being put to the vote it failed to obtain the requisite support, on account of the great expense that the construction of the viaducts would entail on the corporation.

Under these circumstances the corporation proceeded to apply to the Board of Railway Commissioners for an order authorizing the construction of the viaducts and declaring the respective proportions in which the cost of the bridges, etc., should be borne by the railway company and the corporation. Originally no notice of this application was served upon the tramway company. But at the hearing of the application it was pointed out that inasmuch as the proposed constructions would affect the crossings of the tramway company it ought to be served with a copy of the application. Counsel representing the tramway company were present in the court at the time and consented to accept service so that the hearing was continued without interruption. But although the tramway company were thus a party, its counsel took no part in the discussion, except to oppose the contention put forward by counsel on behalf of the railway company, that the tramway should bear a part of the cost of the construction of the viaducts and the street improvements connected therewith.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY - TREASURER — Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY — Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

At the conclusion of the hearing the Board of Railway Commissioners indicated that they would grant the application of the corporation and apportion the cost of the works among the railway company, the corporation and the tramway company, and on Oct. 14, 1912, they accordingly made an order, the operative part of which is as follows:—

"1. The applicant is hereby authorized to construct Hastings, Pender, Keefer and Harris streets across the Vancouver, Victoria and Eastern Ry. and Navigation Co.'s tracks, in the City of Vancouver, by means of overhead bridges, as shown on the plan filed with the Board, detail plans of the structures to be submitted for the approval of the Chief Engineer of the Board.

"2. Twenty per cent. of the cost of the actual construction work at each of the crossings on Pender and Keefer streets, not to exceed in each case $5,000, shall be paid out of the railway grade crossing fund; 25% of the remainder of the cost of such work shall be borne and paid by the applicant, and 75% by the Vancouver, Victoria and Eastern Ry. and Navigation Co. Twenty per cent. of the cost of constructing Harris St. bridge, not to exceed $5,000, shall be paid out of the railway grade crossing fund; 20% of the remainder of such cost to be paid by the applicant; 20% by the B.C. Electric Ry. Co., and 60% by the Vancouver, Victoria and Eastern Ry. and Navigation Co. Twenty per cent. of the cost of constructing the Hastings street bridge shall be paid by the applicant; 20% by the British Columbia Electric Ry. Co., and 60% by the Vancouver, Victoria and Eastern Ry. and Navigation Co.

"3. The cost of depressing the tracks of the Vancouver, Victoria and Eastern Ry. and Navigation Co. shall be included in the cost of the work.

"4. The cost of maintaining the Keefer, Pender, Harris and Hastings street bridges shall be borne and paid: 50% by the applicant, and 50% by the Vancouver, Victoria and Eastern Ry. and Navigation Co.

"5. In case of dispute between the parties in carrying out the terms of this order, the same shall be settled by the Chief Engineer of the Board."

The tramway company thereupon applied to the Supreme Court of Canada for leave to appeal to that court from the above order in so far as the order directed that the tramway company should pay a portion of the cost of construction of the Harris and Hastings street bridge, and obtained permission so to appeal on the ground that the Board of Railway Commissioners had no jurisdiction to order the tramway company to pay any proportion of the costs of the bridges and other works mentioned in the order. The appeal came on before the Supreme Court of Canada on April 7, 1913, and was dismissed with costs by a majority of the judges of that Court, Duff and Brodeur, J.J., dissenting. The order dismissing the appeal is dated May 6, 1911, and it is from this order that the present appeal is brought.

Their Lordships entirely agree with the remarks of Duff, J., as to the ground and reason of the application of the corporation to the Board of Railway Commissioners. Referring to the statement made at the hearing by Mr. Baxter, who represented the corporation, he says:—"Mr. Baxter's statement makes it quite clear that the occasion for the application arose from the necessity of determining the permanent grade of these four streets. It was a question," he said, "whether on the one hand the grade was to be elevated, or on the other, the grade was to be made to conform to the grade of the railway tracks and level crossings established. It was necessary to have the matter disposed of because people were applying for permits to build upon these streets, and these could not be granted owing to the inability of the municipality to give the grade of the streets. The council preferred the former of the two alternative courses because they recognized that the street grades were too low and must inevitably be raised."

It follows, therefore, that the application was a matter between the corporation and the railway company alone. The tramway company was entitled to be present to see that its interests were not prejudiced by any order which might affect injuriousiy property belonging to it. But the application was not made against it, nor was it

asking any privilege from the Board of Railway Commissioners, so that its presence did not give to the Board any jurisdiction to make this order against it. If the Board possessed any such jurisdiction it must be derived from the provisions of the statutes which created it and gave to it its powers. Their Lordships can find nothing in those statutes which empowers the Board to make any such order against the tramway company. The only portion of the tramway lines which was subjected to the jurisdiction of the Board was the actual crossings, and those only so far as concern secs. 227 and 229 of the Railway Act, and these sections have nothing whatever to do with such matters as these streets improvements. So far as concerns the cost of the bridges or the cost of lowering the track of the railway company (which by the order was included in the cost of the viaducts), the tramway company was in precisely the same position as any private citizen of the City of Vancouver. It is evident from the reasons given by the Board of Railway Commissioners that they directed the tramway company to pay a proportion of the cost of the improvements because they were of opinion that the tramway company would benefit by them. They say:—"It being a substantial benefit to them we are of opinion that they should contribute to the cost of the two bridges they will use. That is, the bridges at Hastings and at Harris."

The same language might have been used about a private citizen owning some large shop on one of the streets, or owning premises on either side of the valley, who would profit by the connection being on the level instead of by two steep and opposite grades, and such a private individual would be just as much under the jurisdiction of the Board as was the tramway company. The fundamental error underlying the decision of the Board is that they have considered that the fact that the tramway company would be benefited by the works gave them jurisdiction to make it pay the cost or a portion of it. There is nothing in the Railway Act which gives any such jurisdiction.

An attempt was made to treat the order of the Board as being made under the powers of sec. 59 of the Railway Act, and it was contended that such section entitled the Board to require that the tramway company should pay a portion of the expense. It is sufficient to point out that the order is not made under sec. 59, nor does it come within its provisions. It does not direct that any work should be done. It is an order of a purely permissive character, granting a privilege to the corporation which it may exercise at the expense of a third party, and it leaves it to the corporation to decide whether it shall avail itself of it or not. The provisions of sec. 59 relate to a wholly different class of cases.

It is not necessary for their Lordships to deal with any of the other weighty reasons given in the judgment of Duff, J. On the grounds above stated they are of opinion that the order so far as it directed the appellants to pay a portion of the costs was made without jurisdiction, and they will humbly advise His Majesty that the appeal should be allowed with costs, and that the order of the Supreme Court should be set aside, and that in lieu thereof an order should be made, with costs, allowing the appeal to the Supreme Court of the present appellants, and setting aside the order dated Oct. 14, 1912, of the Board of Railway Commissioners, in so far as the said order directs that the B.C. Electric Railway Co. shall pay a certain proportion, as provided in the said order, of the cost of the construction of the Harris and Hastings street bridges referred to.

Montreal Tramways Company Annual Report.

The following report for the year ended June 30, was presented at the annual meeting, Aug. 4:—

Your directors beg to submit their third annual report, accompanied by the financial statements, which show the following results:—

Gross Earnings		$7,142,804.19
Operating Expenses		4,206,114.57
Net earnings		$2,936,689.62
From which deduct:—		
City percentage on earnings	$527,383.98	
Interest bonds and loans	787,768.83	
Interest debenture stock.	800,000.00	
Taxes	84,700.00	
		$2,199,852.81
Net income		$ 736,836.81
Dividends		242,056.00
Surplus		$ 494,780.81
Less:—		
Balance of discount on bonds sold	$ 82,236.83	
Transferred to contingent renewal account	275,000.00	
		$ 357,236.83
Transferred to general surplus		$ 137,543.98

The gross earnings have increased during the year $388,576.82 or 5.75%, the operating expenses $173,450.00 or 4.30%, and the net earnings $215,126.82 or 7.90%. The ratio of operating expenses to earnings is 58.89%, compared with 59.71% last year, which is considered satisfactory. $417,124.99 has been charged to contingent renewal account during the year representing expenditures made for special renewals. $829,706.18 has been expended on the maintenance of properties, plant and equipment, and charged to operating expenses. This amount, together with $417,124.99 charged to renewal account, makes a total expenditure of $1,246,831.17 during the year on the upkeep of the properties. This is equal to 17.46% of the gross earnings. During the year there has been expended on capital account for additional rolling stock, extensions and improvements to the property, $2,711,572.19. During the year there has been redeemed and cancelled $313,893.27 of the underlying bonds of the company. The amount of underlying bonds redeemed to date is $838,606.59.

Large additions have been made to rolling stock during the past year. A new type of motor car and trailer has been introduced which has very materially helped the service on St. Catherine St., its main line, and the company is now considering the advisability of building more cars of this type as requirements may warrant. The increased rolling stock and extensions made have necessitated further extensions of power requirements, which has also been materially increased during the past year. The company has also completed a large portion of the rebuilding of its track, which it is proposed to continue as fast as possible. Owing to the rapid growth of the city, for some time past the city has been requesting the company to make numerous extensions of its service in outlying wards not covered by the contract between the city and the company, and negotiations are now pending for a readjustment of the existing contract, and it is hoped that a satisfactory agreement will be completed which will provide the company with the proper facilities to meet the constant demand necessitated by the rapid growth of Greater Montreal.

In conclusion, your directors desire to place on record their appreciation of the valuable and faithful services rendered by officers and employes of the company.

STATISTICS.

Expenses % of earnings	58.89
Passengers carried	168,472,952
Car earnings per passenger	4.11
Transfers	58,120,066
Total passengers carried	226,593,018
Car earnings per passenger total carried	3.05

ASSETS.

Cost of road and equipment to June 30, 1913.		$33,889,816.68	
New construction for the year		2,711,572.19	
			$36,601,388.87
Accounts receivable		346,985.92	
Stores		554,940.14	
Cash:—			
In bank and on hand	$216,869.02		
Underlying securities redemption fund	308,434.76	$525,303.78	$1,427,229.84
Investments			$ 366,262.50
			$38,394,881.21

LIABILITIES.

Capital stock (common) subscribed	$3,000,000.00		
Less unpaid and subject to call	451,420.00	*$ 2,548,580.00	
Debenture stock		* 16,000,000.00	
First and refunding mortgage 5% gold bonds due July 1, 1941		13,335,000.00	
Underlying bonds:—			
4½% due Aug., 1922	681,333.33		
4½% due May, 1922.	1,500,000.00		
4½% due May, 1922.	2,238,666.67		
	4,420,000.00		
Less redeemed and cancelled to date	838,606.59	3,581,393.41	
Mortgages		26,863.00	
			$35,491,836.41
Accounts and wages payable		623,604.34	
Accrued interest		234,352.00	
Accrued tax on earnings		396,402.39	
Employes' securities		24,907.28	
Unclaimed dividends		1,956.57	
Unredeemed tickets		157,476.34	
Suspense		143,801.02	
Dividend pa yable Aug. 1....		63,739.00	1,646,238.94
Capital reserve		600,000.00	
Contingent renewal reserve		117,631.01	
Surplus		539,174.85	1,256,805.86
			$38,394,881.21

*This includes the amount due on shares not yet exchanged.

The proceeding were of a purely formal character, the President, E. A. Robert, stating that the company was in good shape to take advantage of all improvements in transportation that might eventuate. A. Stewart was elected auditor for the current year, and $23,000 was appropriated for directors' servies, a similar amount to that voted in the previous year.

Following are the officers and directors for the current year:—President, E. A. Robert; Vice Presidents, J. W. McConnell and F. H. Wilson; other directors,—Hon. J. M. Wilson, J. M. McIntyre, P. J. McIntosh, W. C. Finley, G. G. Foster and W. G. Ross.

Answers to Questions on Electric Railway Topics.

Following are a few questions on electric railway topics, sent to the American Electric Railway Association's question box, recently, with replies thereto by W. F. Graves, Chief Engineer, Montreal Tramways Co.:—

Minimum Radius Curves. What should be the minimum radius curve to take care of modern railway equipment? The question as it stands is so indefinite that it is rather difficult to answer. Cars with a 4½ ft. wheel base, 20 ft. truck centres, operate readily around curves of 35 ft. radius, and can be operated, by widening throatways, around curves of 30 ft. radius.

The Use of Sharp Pointed Spikes. Assuming that a spike with a sharp point is 13% more efficient in holding power than an ordinary chisel edge spike, and costs 15% more than the chisel edge spike, is it good practice to use the sharp point spike? The tendency of a sharp point on a track spike would be to split the tie, particularly in the hard close grained woods. I question very seriously the 13% greater efficiency of the pointed spike over the chiselled point.

Work Inspection. In first class track construction should there be inspection of work during execution by others outside of the supervising force in actual charge of the construction? I believe that engineering inspection of track construction outside of department supervision is a very good thing, particularly in view of the large amount of money expended per mile of track in first class track construction. Care should be taken however to make sure that outside inspectors work in perfect harmony and accord with the department heads. Otherwise friction results which is much to the detriment of the construction itself.

Inspection Records of Bridges and Buildings. Should there be a monthly inspection record of buildings and bridges? By all means, a monthly inspection record of bridges and buildings should be on file in the department files. It is our practice to have the Superintendent of Bridges and Buildings make a personal inspection once each month, occasionally accompanied on these inspections by the Assistant Chief Engineer, and decisions have in a number of instances been made on the ground, as to construction and repair work of the department. These inspections are joint inspections and are matters of record.

Automobiles Passing Standing Electric Cars.

Canadian Railway and Marine World for August contained, on page 387, particulars of cases tried at Ingersoll, Ont., July 18, in which charges against two automobile drivers for passing an electric car when it was standing at Beachville were dismissed by the magistrate on the ground that the Motor Vehicles Act (Ontario), 1913, chap. 52, sec. 4, only applies to electric railways in a city or town, or not more than a mile and a half beyond the limits thereof. The following comments on the case are reproduced from the Woodstock Sentinel Review:—

"The Ingersoll magistrate has decided that a street car is not a street car, within the meaning of the law, when it reaches Beachville though it is a street car within the meaning of the law in Woodstock or Ingersoll. According to the law, it is an offence to drive a motor vehicle past a street car standing to take on or discharge passengers. Cars running between Woodstock and Ingersoll cross at Beachville, and frequently a car is held there for several minutes awaiting the arrival of another. The Beachville constable summoned some automobile drivers for driving past while trolley cars were standing on the track at the village. For the defence the point was raised that the trolley car was not a street car in a village; that it was a street car only when it was running on the street of a town or city, or a mile and a half beyond the limits of the town or city, as defined by the Railway Act. The magistrate held that the point was well taken and dismissed the cases.

"The incident shows that there is need for some amendment or addition to the law to make it more serviceable and more readily understood. The point at Beachville where the cars cross is a danger point. A good many passengers are received and discharged there, right on the open highway. There ought to be some protection for them. On the other hand, it would be absurd to hold up an automobile all the time a trolley car may be standing at Beachville awaiting the arrival of another car. There ought to be some check on reckless driving which would not, at the same time, be an unnecessary hardship to responsible drivers. The incident serves the purpose of drawing attention to the fact that there is a law which makes it an offence to drive an automobile past a street car which is standing to take on or discharge passengers. Presumably this law is enforceable in Woodstock and, according to the decision of the Ingersoll police magistrate, a mile and a half beyond the city limits. Certainly it has not been enforced. Is it necessary to wait until an accident occurs?"

Electrification of the London and Port Stanley Railway.

The work of renovating this line, preparatory to its electrification by The London Railway Commission, is progressing rapidly, a good portion being completed. The whole line is being reballasted by the Pere Marquette Rd., which is still operating it. The steel on the main line, with the exception of around the switches at the terminals, has been renewed with 80 lb. rails, Canadian Northern Section, and the ties are being replaced with new untreated cedar ties. The following contracts were made: Algoma Steel Co., 3,000 tons of rails and angle bars, 30,000 tie plates; J. J. Gartshore, 380,000 spikes; Canadian Ramapo Iron Works, 52 sets of switches and frogs; Steel Co. of Canada, 34,000 track bolts and 65,000 tie plates; and Canadian Concrete Products Co., 1,100 ft. of concrete piping of various sizes. The inspection of most of the material was made by R. W. Hunt and Co.

Specifications are nearing completion for the electrification of the line, including substations, overhead construction, bonding, cars and locomotives. Terminal plans are also being considered. The engineering work is all being handled by the engineering staff of the Hydro Electric Power Commission of Ontario, F.A. Gaby, Chief Engineer.

The electro-pneumatic signal, whether installed with low voltage battery current or high voltage line current, is instantaneous in its action, reliable, and can be depended on to transmit signals correctly and distinctly, eliminating entirely the elapsed time between the pulling of the cord and the signal reaching the engineman, no matter how fast the cord is pulled, or how short an interval is allowed between the blasts.

Moose Jaw Electric Railway Company's Annual Report.

Following are extracts from the third annual report for the calendar year 1913, issued over the signatures of A. A. Dion, President, and D. R. Street, Secretary-Treasurer, both of Ottawa:—

The revenues from all sources aggregate $136,300.48. The expenses of management, operation and maintenance, together with bank interest, amount to $96,906.11, leaving a surplus of revenue over expenditure of $39,394.37. During the year $150,221.14 was expended on capital account, which includes the completion of car barns, the purchase of 10 new cars, the addition of a generating unit, consisting of a 500 h.p. Diesel engine with generator, also the extension of the line north through Lynbrooke and Boulevard Heights.

The balance at credit of profit and loss account, after the addition of this year's surplus, was $54,753.96, from which your directors have paid quarterly dividends at the rate of 6% per annum, aggregating $35,842.35, leaving $18,911.61 at the credit of this account. The traffic increases have not been quite up to expectations, Moose Jaw, like other cities throughout Canada, having been seriously affected by the financial stringency. Your directors, however, consider the results satisfactory, in view of the fact that during the past year municipal street railway undertakings generally throughout the west have been operated at a loss, but it is confidently felt that an improvement of financial conditions, which is expected with the next crop, will be reflected advantageously upon the company's earnings.

At the close of last year an offering of $50,000 of new stock was made to the shareholders. The fact that this was largely over subscribed proved the confidence that the shareholders have in the future of this undertaking.

The average number of cars in use during 1913 was 11.26, against 7.45 in 1912. The lowest monthly average in 1913 was 9 in March, April and May, and the highest monthly average was 14.2 in August.

The average earnings per car mile in 1913 were 21.79c. The total number of passengers carried in 1913 was 2,440,190, against 1,619,805 in 1912.

ASSETS.

Cash on hand	$ 3,334.91
Property, plant and equipment	720,349.47
Expenditure, including insurance, etc., paid on account of period beyond Dec. 31, 1913	7,364.05
Accounts receivable	752.72
	$731,801.15

LIABILITIES.

Bills payable	$ 42,000.00
Accounts payable	19,879.20
To the public	$ 61,879.20
Capital paid in	640,845.00
Profit and loss	18,911.61
Dividends unpaid	10,165.34
To the shareholders	$669,921.95
	$731,801.15

The directors are A. A. Dion, President; N. J. Ker, Vice President; D. R. Street, Secretary-Treasurer; A. H. Dion, General Superintendent; C. E. Armstrong, E. J. Daly, P. B. Mellon, D. O'Connor, T. F. Ahearn.

Ontario West Shore Railway.—We are officially advised that no tender was received by the Trustee up to August 15 for the purchase of this uncompleted road.

During June, only one death was reported of an employe on electric railways in the Dominion. It was that of an employe of the incline railway at Hamilton, Ont., who was struck by a falling cross tie.

Electric Railway Projects, Construction, Betterments, Etc.

Berlin and Northern Ry.—We are officially advised that the line now being operated extends from Berlin to Bridgeport, and that it is being extended northerly from Bridgeport to Bloomingdale, Ont. It is owned and operated by a private company, W. H. Breithaupt, Berlin, being President. The company runs two cars on the line, and secures power from the city of Berlin. (Aug., pg. 385.)

British Columbia Electric Ry.—Construction is being proceeded with rapidly on the new car barns at Fourteenth Ave. and Main St., Vancouver.

Application has been made to the company to extend its lines on Fifty-Fifth Ave. between Victor and Kerr Roads, Vancouver.

A contract is reported let to M. J. Coughlan and Sons for the erection of a steel bridge across False Creek at Kitsilano, on the Eburn line, to replace the present wooden trestle.

It is said that the basis of an agreement was reached Aug. 13, between the company and the Vancouver City Council on the bridge question. In consequence of this it is reported that the improvements and extensions on the Hastings St. East, and Nanaimo St. lines will be gone on with at once.

Various questions have been raised between the city of Vancouver and the company as to the use of bridges. It was recently found that the company was not paying rental for the right to cross certain bridges, and pending the settlement of the matter, the company has decided not to do anything in the way of track extensions arranged for. In some cases the city proposes to charge up to $10,000 a year for the use of a bridge, while the company contends it should not pay more than the interest on the cost of the tracks. A number of meetings have been held, but nothing like a decision has yet been reached. (Aug., pg. 385.)

Edmonton Interurban Ry.—Press reports state that the line between Edmonton and St. Albert, Alberta, is being electrified, that power for its operation will be supplied by the City of Edmonton, and that operation will be resumed Oct. 1. W. T. Woodrooffe, formerly Superintendent, Edmonton Radial Ry., is reported to be in charge of the work. (July, pg. 335.)

Fort William Electric Ry.—It is reported that there are only two small gaps to complete the connections of the new lines with the rest of the system. Altogether about five miles of new track have heen laid this year. (Aug., pg. 385.)

Hamilton St. Ry.—The extension along Main St., in Barton Tp., just outside the city limits of Hamilton, is reported completed. The connecting link along Kenilworth Ave., in the city, is nearly completed. (Aug., pg. 385.)

Hull Electric Co.—Press reports state that some improvements are ahout to be made on the company's lines, although it is not at all likely that a second track will be built on the Chelsea Road line this year. This is a revival of the reports officially contradicted earlier in the year. (May, pg. 231.)

Since the foregoing was written, we have been officially advised that the company proposes constructing a Y at the terminus of the Chelsea Road line, to permit of the operation of single end cars. A second track will not be built on the Chelsea Road this year.

Hydro Electric Power Commission of Ontario Projected Railway.—The first of a series of bylaws for raising funds to build the proposed electric railway from Toronto to Markham, Port Perry and other points, under the scheme originated by the Hydro-Electric Power Commission of Ontario, will be submitted to the ratepayers of Scarboro township, Sept. 21. Meetings in furtherance of the projected line are being held at various centres in the district to be served, the speakers including Hon. Sir Adam Beck, Chairman of the Commission. (July, pg. 337.)

London and Lake Erie Ry. and Transportation Co.—W. N. Warburton, General Manager, is reported to have stated in Stratford, Ont., Aug. 4, that the company had in view a number of extensions of its line, one being from London to Stratford, and that the company did not propose to ask for a franchise for city lines, hut simply an entrance for a radial line, with a terminus at the G. T. R. station. (June, pg. 283.)

Medicine Hat, Alberta.—We are officially advised that the Montreal Engineering Co., having failed to carry out its agreement for the building of an electric railway in the city, it will in all probability fall through, and the company will be called upon to compensate the city for its failure to comply with the terms of the agreement. An extension of time for carrying out the agreement was granted the company, but proceedings were taken against the Council to have the extension set aside, on the ground that it could not be valid without a bylaw having been passed by the ratepayers. The action was finally defeated on technical grounds.

We are also advised that the city council is negotiating with an Ottawa syndicate respecting the building of an electric railway under practically the same agreement as that made with the Montreal Engineering Co., and that a bylaw granting a franchise will be submitted to the ratepayers at an early date. (July, pg. 335.)

Montreal and Southern Counties Ry.—E. J. Chamberlin, President G. T. R., which controls the M. and S. C. Ry., completed a trip of inspection recently over the line, which is in operation to St. Cesaire, and under construction to Granby, Que. He is reported to have said that work is progressing satisfactorily and that everything is being got ready for the opening of the extension.

The bridge across the Yamaska River at St. Cesaire has been completed. It consists of three spans of 80 ft. each, resting on two concrete piers and two abutments, built on 40 ft. piles. Ross and McCombe were the contractors for the substructure, which necessitated the placing of 2,000 cu. yds. of concrete, and 1,000 cu. yds. of rip rap. Some trestle approach has yet to be completed before cars will be run across the bridge.

Press reports state that a contract for the final section of the line into Granby will be let at an early date. (Aug., pg. 385.)

Morrisburg and Ottawa Electric Ry.—We are officially advised that three tenders were submitted for the building and equipment of this projected electric railway, from Ottawa to Morrisburg, Ont., 55 miles, of which one by a New York construction company is under consideration. The company offers to build the line provided the various municipalities through which it would pass are prepared to guarantee about one sixth of the bond issue, which with the company's stock, would be handed over to the construction company in payment for building and equipping the line. The M. and O. E. Ry. will have bylaws providing for this guarantee submitted to the ratepayers of the different municipalities, at an early date. The company owns about 300 acres of gravel, averaging about 35 ft. in depth, close to the route of the line, and about 25 miles from Ottawa, which will be valuable for ballasting purposes. President, J. G. Kilt; Secretary, R. A. Bishop; Chief Engineer, L. Von Sydow; offices, Union Bank Building, Ottawa.

The company is reported to have offered the Ontario Government 40 or 50 ft. of its right of way between Ottawa and Morrisburg, on condition that a provincial road is built alongside the tracks.

The Morrisburg Town Council has been asked to give a guarantee on $25,000 of bonds, and is considering the proposition. Gloucester township was asked to guarantee $70,000 of bonds, but on Aug. 12 passed a resolution declining to take any action. The Williamsburg township council, which was also asked to guarantee $70,000 of bonds, asked the ratepayers to vote on a bylaw Aug. 17.

Port Arthur Electric Ry.—Bylaws were approved Aug. 3, by the ratepayers of Port Arthur, Ont., authorizing the expenditure of $12,000 for a three part double track Y to be placed at the corner of Arthur and Cumberland Streets, to enable the cars to turn either way without delaying traffic; of $2,620 to lay a passing track on Arthur St.; to provide $26,000 to purchase certain lots, part of which is required for the extension of the line through the O'Brien addition, the balance of the lots to be sold at a future date. (April, pg. 184.)

Prince Albert, Sask.—We are officially advised that the offer of the interests associated with the Moose Jaw Electric Ry., for a franchise for an electric railway in Prince Albert, Sask., will not be further considered until several months hence. A proposition had been submitted to the Prince Albert Council from another source, in respect of which some sort of option was given, and until this expires nothing further can be done.

A bylaw to raise $250,000 for the building of a municipal railway will be submitted to the ratepayers at an early date. (July, pg. 306.)

St. John Ry.—Press reports state that the company is contemplating extending its line through Glen Falls subdivision as far as Maynor House, St. John, N. B. (June, pg. 283.)

The Sandwich, Windsor and Amherstburg Ry. has, in accordance with an order of court, restored Ferry St., Windsor, Ont., to the condition it was in prior to the attempt to lay the new track there. (Aug., pg. 386.)

Three Rivers Traction Co.—The question of the franchise proposed to be granteed this company for the building of an electric railway in Three Rivers, Que., has been further considered by the Council, but no definite decision has been announced. (Aug., pg. 386.)

Toronto and York Radial Ry.—The extension of the track on the Lake Shore Road from the old terminus at the G. T. R., Sunnyside crossing, across the new highway bridge to the front of Sunnyside station, King St., has been completed, and the company is operating its cars over it. The track has been huilt hy the city, as an extension of the Sunnyside-Humber section of the Lake Shore division of the T. and Y. R. Ry. acquired recently upon the expiration of the franchise. This section of the line is still being operated hy the company under an agreement with the city. The city is now

paving the track allowance on this section of the line. (Aug., pg. 386.)

Toronto Civic Lines.—Plans have been prepared for the erection of a carbarn at Hillingdon Avenue on the Danforth car line, at an estimated cost of $25,000. The building will be L shaped, 198 by 199 ft., of brick and terra cotta on a steel framework. Six tracks will be run into it, and the offices will be in the wing at the rear end. Work is to be started at once, and the barn is expected to be ready for occupation early in 1915.

The Toronto City Council has decided to grade Queen St., Balmy Beach, so as to provide a satisfactory right of way for the stub line, which is being operated by the Toronto and York Radial Ry. The materials have been ordered for the track work. Commissioner Harris is quoted as saying Aug. 12, that grading the street would be started at once.

Toronto Ry.—The Toronto City Council has authorized the expenditure of $25,065 for paving the track allowance and any necessary turn outs on the extension of the Terauley St. line from Agnes St to College St., recently ordered by the Ontario Railway and Municipal Board to be built.

Toronto Suburban Ry.—Construction was resumed on the section of the Lambton-Guelph line between Lambton and Islington, Aug. 4, and it was expected that track would be laid under the C.P.R. and as far as the bridge across Mimico Creek before Aug. 31 The concrete abutments for this bridge have been completed, and it will only take a short time to place the steel girders as soon as they are delivered. Track has been laid from Islington to beyond Georgetown, and carloads of ties and rails are being sent forward from the storage yard at Cooksville towards Guleph. A first lift of ballast has been given on several miles of track. While it is reported that the line will be in operation to Guelph in the autumn, it does not appear to be at all likely, considering the number of men employed, and the fact that nothing has been done in the construction of the bridge across the Humber at Lambton. (Aug., pg. 386.)

Tramways, Limited, is promoting a project for the building of an electric railway from Edmonton to Namao and Fort Saskatchewan, Alberta. To make the proposal successful it was desired to secure a right of way to the public market in Edmonton, and negotiations were entered into with the City Council. The Council agreed to grant running rights over the city lines to the market place, for 25 years, upon favorable terms, but insisted on the insertion of a clause giving the Council the right to terminate the agreement at the end of any 12 months, by giving three months notice. The agreement was fully discussed July 28, when it was intimated on the part of the company that the restriction inserted in the agreement would prevent construction being undertaken this year. The city offered as a compromise to deliver the company's passengers, freight and express at a terminal point in the city, in the event of the running rights being withdrawn. Among those interested in Tramways, Limited, are:—Messrs. Stutchbury, Farncombe, and Hogan of Edmonton; G. Carson, of Namao; A. H. Wilkinson, J. Broomfield, A. Carson, of Sturgeon district. (April, 1913, pg. 186.)

Transcona, Man.—Work is reported to have been started on the line from Transcona to the Winnipeg city boundary. Ties were being distributed along the right of way, Aug. 4, and it is reported that the steel rails are en route. (Aug., pg. 386.)

The Winnipeg Electric Ry. Co. has laid before the City Council two sets of plans for the bettering of traffic conditions at St. James' subway. One provides for the laying of a new track on the north side of the roadway, and a rerouting of traffic, and the second provides for the building of a subway in the middle of Portage Ave. These are under consideration in the engineering department.

A report on the condition of the Winnipeg, Selkirk and Lake Winnipeg Ry., by B. S. Mackenzie, Consulting Engineer, was laid before the Manitoba Public Utilities Commissioner Aug. 1. The report suggests that considerable improvement to the roadbed is necessary to bring it up to a proper condition, and points out that satisfactory progress is being made upon work for the betterment of the line. The entrance to Selkirk is on a curve, at the bottom of a 2.5% gradient, and it is claimed that it is not sufficiently protected. (Aug., pg. 387.)

Electric Railway Notes.

Port Arthur, Ont., ratepayers have passed a bylaw authorizing the purchase of at least four new street cars at a cost of $22,000.

The Calgary Municipal Ry. gives employment to 301 men, and the total daily wage paid them amounts to $957.73.

The Port Arthur Electric Ry. has received four single truck, double end, p.a.y.e. type cars, equipped with two Westinghouse 101 B2 motors, from the Preston Car and Coach Co.

The matter of the connection between the British Columbia Electric Ry.'s Fraser Valley branch, and the Chicago, Milwaukee and Puget Sound Rd. line at Sumas, B. C., for the interchange of freight is, we are officially advised, still in abeyance.

The residents of St. Thomas, Ont., have expressed themselves strongly against any further attempts being made to stop Sunday traffic on the London and Lake Erie Ry. and Transportation Co.'s line between London and Port Stanley, Ont.

The Winnipeg Electric Ry.'s entire stock of cars is to be adapted for p.a.y.e. service. City Traffic Supervisor Lewis reported to the Board of Control, Aug. 1, that this would necessarily take some time. There were on that date 33 p.a.y.e. cars in operation in the city.

The Calgary, Alberta, City Council is considering a proposal for the carrying of freight on the city's electric railway. It is proposed to run spur tracks into the industrial district, and to have connections with the different steam railway tracks entering the city.

We are officially advised that the position of Traffic Agent, British Columbia Electric Ry., Vancouver, rendered vacant by the resignation of J. B. Rannie, as announced in our last issue, will not be filled, the duties connected with that office being divided among other officials.

The one man car system is now in full operation on the Lethbridge Municipal Ry., and, we are officially advised, it has so far proved very successful. During the exhibition week about 12,000 people a day were handled without the slightest hitch, and on a faster schedule than in previous years with two men to the car.

The London and Lake Erie Ry. and Transportation Co. has made arrangements with the Canadian Express Co. for the carriage of express matter over the section of its line between St. Thomas and Port Stanley, Ont., and has made application to the St. Thomas City Council for permission to run over the city's line to the G. T. R. station on Talbot St., in order to carry out the agreement.

The Winnipeg Electric Ry. placed an order in its own shops at the beginning of the year for building 20 double truck closed cars, 46 ft. 10 ins. over all, and 8½ ft. wide, all of which will be for p.a.y.e service. The Company is also adapting a number of its other cars for p.a.y.e. service, which simply involves putting doors on the rear vestibules and a dividing railing for entrance and exit. All the cars which the company has built in recent years have long platforms, suitable for p.a.y.e. work.

J. M. Lord, a storekeeper on Ferry St., Windsor, Ont., has entered an action against the Sandwich, Windsor and Amherstburg Ry. for $10,000 damages, alleged to have been sustained owing to the torn up condition of Ferry St., in front of his place of business. The matter of building a loop line along this street has formed the subject of a long controversy between the company and the City Council.

It is announced that the city of Birmingham, England, has withdrawn its first class cars from service, because of insufficient patronage. Some years ago several of the larger cities adopted the system of placing so-called first class cars on selected parts of their systems and charging higher fares for their use, but in no case has it been of any advantage. Some of these class cars are still in use in Liverpool, a higher fare being charged for the use of the lower compartment, but they are not well patronized, and their discontinuance is an early possibility

The London St. Ry. has ordered four single truck, p.a.y.e. cars, from the Preston Car and Coach Co., similar to those ordered last year, and added to the company's equipment during the current year. These cars were fully described and illustrated in Canadian Railway and Marine World of Dec., 1913. The company has also decided to remodel four large open cars so that they will be suitable for winter service, and yet be convertible to open cars at a small expense. This will give eight additional cars for winter service. It has also been decided to remodel the older cars to the p.a.y.e. system, as rapidly as they can be spared from the service.

The Public Service Commission of Massachusetts has issued an order to all street railway companies in the State, that all passenger cars hereafter purchased and operated shall be equipped with steps not over 15 ins. high, the bottom step to be measured from a point even with the top of the rail; that all passenger cars now owned and operated, and which are to be operated after July 1, 1915, shall, prior to that date, be so altered that no step shall be more than 17 ins. high, provided, however, that a street railway, by reason of its financial condition, or of the large amount of equipment now owned by it which must be altered in compliance with this order, or for other good cause shown, may, upon application to the Commission, have such time extended if in the Commission's judgment such company shall have shown reasonable progress in complying with this order consistent with its financial ability to do so. In addition, it has been ordered that all street railway companies shall, before purchasing new passenger cars or making substantial changes in their present equipment, submit to the Commission for approval, plans or drawings in sufficient detail to show the type of cars to be purchased or the changes to be made in the equipment now in use.

Electric Railway Finance, Meetings, Etc.

Brandon Municipal Ry.—The operations for June are reported to have resulted in a surplus of $500 over operating expenses. The revenues for July, owing to the annual exhibition, and the operation of the cars on Sundays, are expected to show a much better result.

Brantford St. Ry.—Grand Valley Ry.—All the details affecting the transfer of these lines to the Brantford, Ont., City Council, having been settled, they were formally taken possession of Aug. 5 on behalf of the city by C. H. Hartman, W. R. Turnbull and A. K. Bunnell, the Commissioners appointed for their management until the municipal elections in January, 1915. The officials in charge at the time of transfer have been retained for the present, namely:—J. P. Verner, acting Superintendent; and J. Creasser, acting Secretary.

British Columbia Electric Ry. and Allied Companies. Gross earnings for June, $660,383; operating expenses, maintenance, etc., $509,417; net earnings, $150,966, against $680,693 gross earnings; $488,785 operating expenses, maintenance, etc.; $191,908 net earnings for June, 1913. Aggregate gross earnings for 12 months ended June 30, $8,789,287; net earnings $2,348,462, against $8,492,239 aggregate gross earnings, $2,425,573 net earnings for same period 1912-13.

Cape Breton Electric Co.—Gross earnings for June, $29,696.95; operating expenses and taxes $17,595.13; net earnings $12,101.82; interest charges $5,228.27; balance $6,873.55; bond sinking and improvement funds $1,190; balance for reserves, depreciation, etc., $5,683.55, against $30,644.70 gross earnings; $17,913.18 operating expenses and taxes; $12,731.52 net earnings; $4,891.66 interest charges; $7,839.86 balance; $1,190 bond sinking and improvement funds; $6,649.86 balance for reserves, depreciation, etc., for June, 1913. Aggregate gross earnings for six months ended June 30, $168,733.25; net earnings $68,573,61; interest, bond sinking and improvement funds $38,215.84; net balance $30,350.78, against $173,215.38 aggregate gross earnings; $68,760.65 net earnings; $36,571.15 interest, bond sinking and improvement funds; $32,194.50 net balance for same period 1913.

Edmonton Interurban Ry.—Two calls of 10% on the capital stock have been made on the shareholders, payable Sept. 23 and Nov. 23, respectively. These are the final calls on the present issue of stock.

A meeting of shareholders was held in Edmonton, Alberta, Aug. 17, to authorize the directors to issue debenture or other stock to secure $75,000 for the purposes of the company's undertaking and to execute the necessary mortgage.

Edmonton Radial Ry.—Gross earnings for June, $59,856; operating expenditure, $26,076; cost of power, $12,055; cost of maintenance, $8,725; total charges, $46,856; net revenue, $13,000; fixed charges, etc., $26,731; deficit, $13,731. Passengers carried, 1,252,303; average fare, 4.8c. This is the first complete month's operation under the increased fare.

Fort William Electric Ry.—For July a profit is shown over operating expenses, sinking fund and all other items. The total revenue was $13,256.84; operating expenses, $8,548.99; interest and sinking fund, $5,415.43, and added to this, 5% of the gross receipts are set aside for accidents and other causes, bringing the total expenditure to $14,727.26, leaving a net profit of $529.58.

London and Lake Erie Ry. and Transportation Co.—A special meeting of shareholders was held in London, Ont., Aug. 18, to authorize an issue of bonds at the rate of $30,000 a mile. The proceeds will be used for retiring the existing issue, and for other purposes.

Port Arthur Electric Ry.—The report of the operations of the line for the six months ended June 30 was presented to the City Council recently. Gross earnings were $66,350.50; operating expenses, $51,905.72; operating income, $14,444.78. Against this, interest and sinking fund were $31,837.02, and accidents, $3,317.50, a total of $35,154.52, showing a net loss of $20,709.74, irrespective of any allowances for depreciation.

Saskatoon Municipal Ry.—Gross revenue for June, $13,720; operating expenses, $14,266.

Sutherland extension:—Receipts for June, $1,320; operating expenses and capital charges, $966.50.

Sudbury-Copper Cliff Suburban Electric Ry.—A general meeting of shareholders has been called to be held at Sudbury, Ont., Sept. 7, for the purpose of organization. The notice is signed by W. J. Bell, W. Cochrane, J. Mackey, D. N. Morin and L. Laforest, provisional directors.

Toronto Ry., Toronto and York Radial Ry., and Allied Companies.—Gross earnings for June $861,938; operating expenses, maintenance, etc., $445,105; net earnings $405,337 against $815,206 gross earnings; $405,337 operating expenses, maintenance, etc.; $409,869 net earnings for June, 1913. Aggregate gross earnings for six months ended June 30, $5,025,926; net earnings, $2,411,667, against $4,655,486 aggregate gross earnings; $2,249,433 net earnings for same period 1913.

Winnipeg Electric Ry.—Gross earnings for June, $335,012; operating expenses $187,570; net earnings $147,442, against $321,037 gross earnings; $173,270 operating expenses; $147,767 net earnings for June, 1913. Aggregate gross earnings for six months ended June 30, $2,091,552; net earnings $877,850, against $1,972,374 aggregate gross earnings; $876,989 net earnings for same period 1913.

Personal Paragraphs.

D. M. McINTYRE, K. C., Chairman, Ontario Railway and Municipal Board, was installed as Grand Master, Grand Lodge, I. O. O. F., at Toronto, Aug. 14.

W. V. HUNT, Electrical Engineer, British Columbia Electric Ry., Vancouver, has resigned to commence private practice there. He was in the company's service for a number of years.

W. Y. SOPER, director, Ottawa Electric Ry., returned to Canada from Europe, July 31, accompanied by his two sons and daughter, the last mentioned having been at school in Switzerland.

R. H. SPERLING, who has been appointed Assistant to the Chairman, British Columbia Electric Ry., in London, Eng., was given an appreciative send off on leaving Vancouver. At New Westminster, July 28, he was the guest of the Board of Trade at a complimentary dinner; on Aug. 1, the company's employes in Vancouver presented him with a gold cigar box, and a diamond ring for Mrs. Sperling; while the employes at North Vancouver gave him a large framed group photograph; and on Aug. 3 he was the guest of the executive officers of the company in B. C. at Vancouver.

Lethbridge Municipal Railway's Financial Statement

The following figures respecting the municipal electric railway at Lethbridge, Alta., are taken from the City Auditors' report for the year 1913:—

Assets.

Cost of Property:		
Car barns	$57,861.54	
Roadbed and track	191,068.51	
Overhead	22,217.27	
Rolling stock	67,635.99	
Miscellaneous Equipment	4,148.55	
Shop tools and machinery	502.43	
Track tools	1,186.09	
Engineering	3,896.90	
Construction interest	3,758.31	
		$352,275.59
Supplies on hand	$3,306.24	
Unexpired insurance	656.63	
		3,962.87
Cash on hand and in Bank	$3,566.71	
Sundry accounts receivable	391.12	
		3,957.83
Sinking Fund—deducted per contra	$7,281.12	
Debenture funds unexpired—Due from city's general account		17,224.41
Discount on debentures	$39,377.24	
Loss on operating 1912	5,176.05	
Loss on operating 1913	30,831.22	
		75,384.51
		$452,805.21

Liabilities.

Debentures	$408,877.24	
Less: Sinking fund	7,281.12	
		$401,596.12
Due to city on loan account	$36,007,27	
Due to city on current account	3,281.20	
Sundry	3,247.76	
		42,536.23
Unredeemed tickets		1,391.74
Sinking fund reserve		7,281.12
		$452,805.21

Revenue.

Car earnings	$59,045.42	
Advertisements	1,564.20	
		$60,609.62
Net loss on earnings carried down		4,147.75
		$64,757.37
Balance, being deficit for year carried to balance sheet		30,831.22
		$30,831.22

Expenditure.

Car service	$30,198.85	
Electric power	15,886.48	
Car maintenance	1,415.84	
Track cleaning	2,818.00	
Car house expense	764.32	
Changing switches	442.36	
Oil and waste	565.83	
Sundries	824.69	
		$52,916.37
Repairs, cars	$1,576.18	
" motors	1,996.70	
" air brakes	1,774.91	
" tools and machinery	12.49	
" miscellaneous equipment	65.63	
" overhead	576.54	
" track and roadbed	954.59	
		6,957.04
Direct operating expenses		$59,873.41
Salaries	$1,762.00	
Printing and stationery	211.67	
Insurance	716.63	
Office expenses	307.10	
Amusements	1,431.26	
Damages	455.30	
		4,883.96
Working expenses		$64,757.37
Net loss on earnings brought down		$4,147.75
Debenture interest	$14,812.99	
Other interest	4,982.35	
Sinking fund	6,888.13	
		26,683.47
		$30,831.22

The railway is in charge of Arthur Read, Commissioner of Public Utilities.

Marine Department

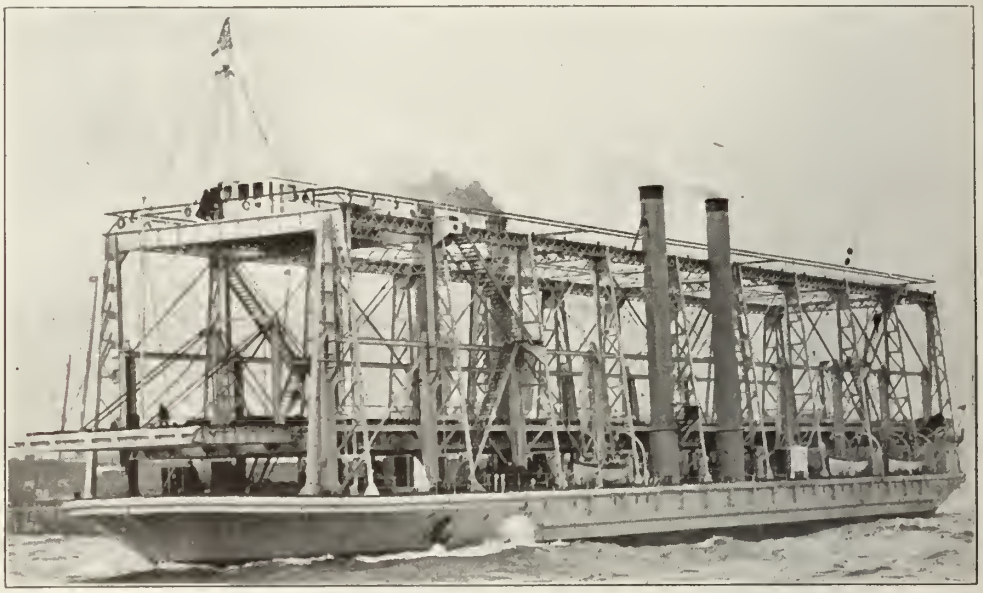
National Transcontinental Railway Car Ferry Leonard, for St. Lawrence River.

A detailed description of the construction and equipment of the car ferry Leonard, which is intended for conveying trains across the St. Lawrence, pending the completion of the Quebec Bridge, was given in Canadian Railway and Marine World for March, page 143, with an illustration, showing the train deck raised to the upper level. The vessel was recently completed at Birkenhead, Eng., and underwent a series of exhaustive trials, covering her propelling machinery, as well as the train deck raising and lowering mechanism, with entirely satisfactory results. The owners were represented at the trials by Chas. Duguid, Chief Constructor, Department of Marine, Ottawa, and J. E. Hamilton, Resident Surveyor.

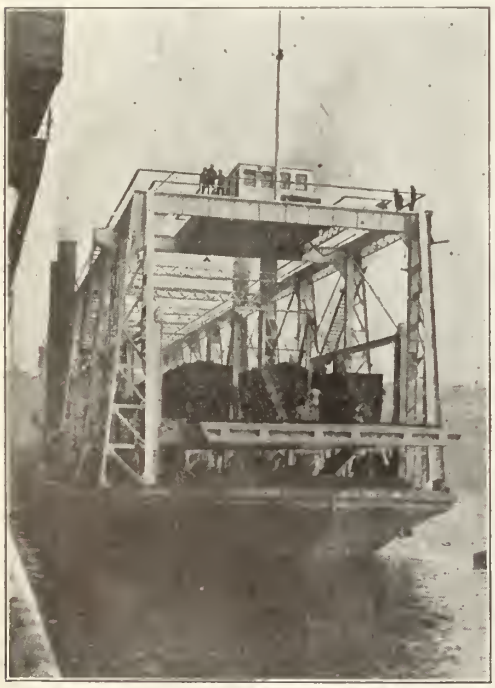
It has been designed for transporting standard passenger and freight trains across the river at all seasons of the year, between Quebec and Levis, the average weight of such train being 1,285 tons. It is calculated that the time taken in running the train on to the ferry, traversing the river, 2½ miles, landing and coupling up the train on the other side, will not take more than three quarters of an hour.

She is of the twin screw type with a third ice breaking propeller at the forward end, and is generally strengthened for service in ice. As a train ferry she represents a new departure, several unique ideas being embodied in her construction. The special feature of the design is the movable tidal car deck. The railway tracks on land at either side of the river are at a fixed level, and the vessel is arranged with a tidal deck to take the cars from the fixed track at any state of the tide, the range being 18 ft. The tidal deck is arranged above the main deck and has 10 transverse girders, each end of which rests on a large nut which works up and down on a vertical screw, giving the deck the necessary range of action to suit the various conditions of the tide. Three lengths of track are placed on the tidal deck, each supported on lattice girders. The length of each track is 272 ft. At each end of the tidal deck is an adjustable hinged gangway suspended by means of treble purchases from struts fixed on the deck. These gangways are arranged with ball and socket joints at the ends of each of the girders carrying the rails, to allow for any heel of vessel, or change of trim which takes place when loading or unloading the cars. A special motor is arranged in conjunction with each gangway for controlling same. The tidal deck lifting screws are hung from ball bearings supported on strong columns, which in turn are stayed by lattice buttresses against fore and aft and transverse thrusts, while below the main deck a specially strong braced strut is built, in way of each column, which distributes the load to the keel.

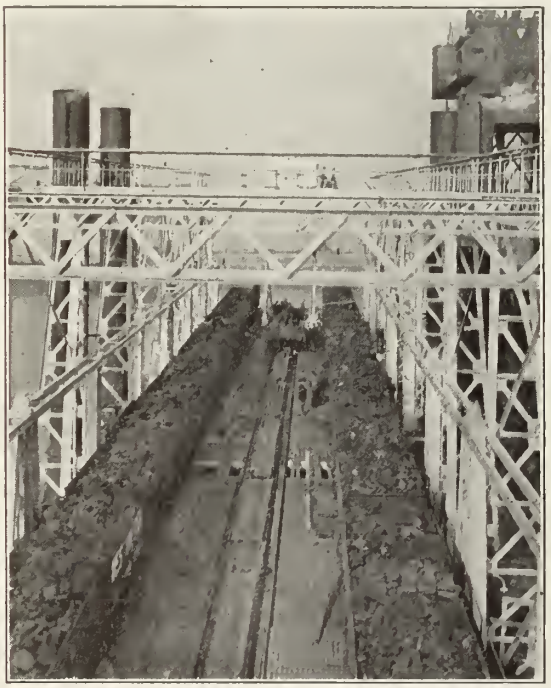
Accommodation is arranged for officers and crew on a flat below the main deck forward on both sides, and everything necessary for full day and night crews is provided. The vessel is fitted with electric light throughout, and an electric winch with two winding drums is fitted between girders of the tidal deck for hauling cars off and on the vessel. Two powerful steam windlasses



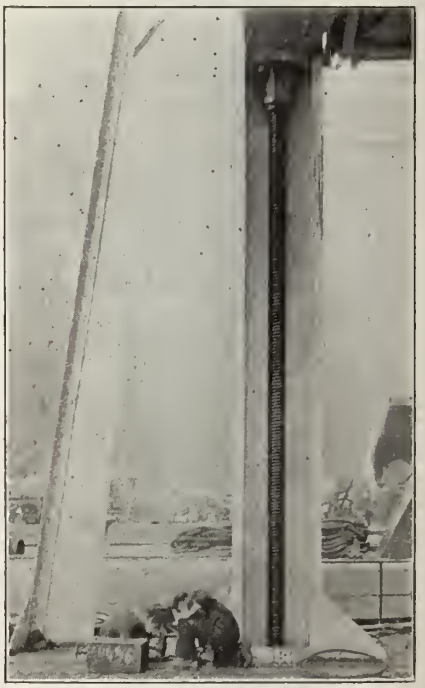
National Transcontinental Ry. Car Ferry, Showing Adjustable Tidal Deck.



Bow View of Car Ferry, Showing Tidal Deck and Hinged Apron.



Looking Down on the Tidal Deck, Showing Two of the Three Tracks Loaded.



One of the Elevating Screws for Raising the Tidal Deck.

are fitted, one on each side with slip drums for mooring. A complete installation of auxiliary machinery has been provided and the hull and machinery complies with Lloyd's requirements.

Although it was anticipated that some delay would occur in allowing the vessel to cross the Atlantic, she arrived at Quebec safely, Aug. 18.

Shipping Interests Oppose Vancouver Harbor Dues.

Considerable opposition has materialized to the recently announced scale of harbor dues to be imposed by the Vancouver Harbor Commission. Until the incorporation of the Harbor Commission, about a year ago, Vancouver was practically a free port, apart from the dockage dues charged by private dock owners. The completion of the Panama Canal, and the admitted unpreparedness of Vancouver to meet any important increase in shipping, led to an agitation for the improvement of the port in this direction. The Dominion Government awarded contracts for dredging the First Narrows from 440 to 1,400 ft. wide, and for dredging False Creek from its mouth to the Main St. bridge, about 1¼ miles, to a depth of 20 ft. at low tide, and a width of 250 ft. The first contract will cost about $1,500,000, and the second one about $1,000,000, by the time they are completed. In addition to these works, the Government is building a dock at an approximate cost of $2,000,000, and it is stated that these are only the commencement of a series of large works, which will make Vancouver a national port of considerable importance. The local shipping interests oppose the new dues on the ground that they are excessive, and that the cost of the improvements should be paid for by the Dominion. The Vancouver Harbor Commission has recently issued a statement showing the relative harbor dues in each of six ports, three in Canada and three in the United States, as follows:—

Quebec.

Harbor dues, 5c. per net registered ton every entry, and not exempt after five entries as at Vancouver..	$150.00
Sick mariners dues 1½c. per net registered ton	45.00
Inward pilotage, May 1 to Nov. 10 from Father Point, $3.87 per ft...	85.14
Outward pilotage, May 1 to Nov. 10 to Father Point, 40c. per ft...	74.80
	$354.94

Note.—Two C.P.R., and two Allan Line vessels get a flat rate on harbor dues running into Quebec. The rate is $333 a trip. The C.P.R. is also compelled to keep two men on the Commissioners' wharf at its own expense.

Montreal.

Inward pilotage from Father Point to Quebec	$85.14
Inward pilotage from Quebec to Montreal	55.00
Outward pilotage from Montreal to Quebec	55.00
Outward pilotage from Quebec to Father Point	74.80
Harbor dues, sick mariners dues ...	50.00
Port Warden dues, inward, say on 2,000 tons of cargo at 2c...	40.00
Port Warden dues, outward, say on 6,000 tons of cargo at 2c.... . . .	120.00
	$479.94

Vancouver.

Pilotage in and out, $1 per ft. and 1c. a ton, at $52	$104.00
Sick mariners dues at 1½c. per net registered ton, five times a year ..	45.00
Harbor dues, 3c. per net registered ton, five times a year	90.00
	$239.00

San Francisco.

Dockage per day or fraction thereof at $4 for first 200 net reg. tons and ¾c. for each additional net reg. ton . .	$ 25.00
Approximate time discharging, four days	100.00
Inward pilotage dues, $3 a ft. draught and 3c. per net reg. ton	156.00
Outward pilotage dues, $3 per ft. draught and 3c. per net reg. ton .	156.00
Inward dues, tonnage, taxes, etc.	188.20
	$625.20

Portland.

Dockage per day or fraction thereof $2.50 for first 200 net reg. tons and ⅜c. for each additional net reg. ton	$13.00
Approximate time discharging, four days	52.00
Inward bar pilotage dues, $1.50 per ft. and 1c. per net reg. ton	63.00
Inward river pilotage, $1.50 per ft. and 1c. per net reg. ton	52.00
Outward pilotage dues	115.00
Inward dues, tonnage tax, etc.	188.20
	$483.20

Note.—No dockage charge on vessels receiving discharging cargo.

Seattle.

Privately owned wharves charge dockage per day or fraction thereof of $4 for first 200 net reg. tons and ¾c. for each additional net reg. ton . ..	$ 25.00
Approximate time discharging, four days	100.00
Harbor Commissioners wharves charge dockage per day or fraction thereof, $4 for first 200 gross tons and ¾c. for each additional gross ton	42.75
Inward dues, tonnage tax, etc.	188.20
Pilotage optional	100.00
	$455.95

Navigation Employes' Fatalities.—During June, 13 employes were killed in the course of their work in connection with navigation in Dominion waters. Of these fatalities 11 were due to drowning, 1 to a fall from a scaffold, and 1 to suffocation as the result of a fall.

The name of the s.s. Lillie Smith, registered at St. Catharines, Ont., no. 94,911, has been changed to Mary Battle.

The Cause of Accidents on the Welland Canal.

The Toronto Globe said recently:—"Accidents on the Welland occur with a frequency that suggests dangerous incompetence. It may or may not be due to the spoils system which impelled the unpardonable dismissal of employes to make places for importunate Government supporters. If this has been a contributing cause it would have been better to pension the seekers for jobs by paying them wages for nothing. Some of the accidents have been clearly due to incompetent management of vessels in the locks. It would be most unfair to charge such accidents against canal employes. But there has been a serious record against the canal operators, and it is time some determined effort were made to avert further loss or injury. Our canals are far too important to be made use of as rewards for election campaign service. If Government supporters must make the public maintain the men who have helped in elections let it be done in or through services in which mistakes do not endanger life and property. Every canal employe should feel that his position depends on the careful and competent discharge of his duties and not on the favor of any man he has helped to elect. This matter is too important to be dismissed by some story about some Liberal employe. The public want the assurance of competence, not of campaign arguments."

L. D. Hara, acting Superintending Engineer of the canal, replied as follows:—"There have been four bad accidents on the Welland Canal this year, and in not one instance was blame attributed in any way to those in charge of the locks. In every one of these accidents it was clearly the fault of the vessel. There were three breaks to lock gates last year. In each case the vessel was at fault, and was the cause of the accident.

"Blame for the break at lock No. 12 recently is placed on the vessel, as the mistake was clearly made by canal helpers, who are employed by the steamers for the trip through the canal, and not upon the locktenders. The lockmaster at this lock, who was in charge at the time of the accident, is one of our most experienced and reliable men, having been appointed before 1896. He has been employed continuously ever since, and went through the Liberal regime. There never was a more competent operating staff employed on the canal than there is at present.

"In the last few years traffic and vessel passages through the canal have been in-

Adjustable Hinged Apron, Connected to Tidal Deck by Ball and Socket Joints.

Main Deck, Showing Tidal Deck Above in Its Raised Position.

creasing at a very rapid rate. In 1911 2,484 passages through the canal were made by vessels. In 1913, 3,247 passages were made, and up to the time of writing 2,0'8 passages have been made, and the year is hardly half over. Take last year, when the number of passages was 3,247, the number of lockages was 3,247 x 25 (there being 25 locks), 81,175, and the accidents only three in number. This works out to a very low percentage considering the ease with which the gates of the mitering type are unmitered. It also must be borne in mind that in about every instance when an accident occurs the vessel to blame is an old wooden one, poorly equipped, and with not any too good a crew on board. As a rule the accidents happen when one of these old vessels is going up through the canal light."

Stranding of the s.s. Saskatoon.

An enquiry into the causes of the stranding of the Merchants Mutual Line s.s. Saskatoon in the St. Lawrence River, off Portneuf light, July 24, was held recently at Montreal by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Captains F. Nash and J. W. Westcott as nautical assessors.

Tbe vessel was bound to Thorold, Ont., from Anticosti Island, with pulpwood, and was proceeding at about 9½ miles an hour, drawing 11 ft. 11 ins. forward and 15 ft. aft. Tbe pilot, Barthelemi Arcand, boarded the vessel at Quebec, and as soon as the vessel got on her course left the bridge for breakfast, and when he returned was given charge of the bridge, tbe captain remaining only a few minutes, leaving with the pilot a man who was signed as second mate, but who held no certificate and who was unfamiliar with the navigation of the river, having made only three trips. The captain did not return to the bridge until the vessel had grounded, although he admits having had sufficient rest. When she struck she was heading west by threequarters south, and after sounding it was found that she was in 12 ft. of water, and about 600 ft. on the starboard side, a little on the forward side, was the black gas buoy 51-Q. The vessel remained aground from 11.30 a.m., July 24, to 10.30 a.m., July 27. The second mate stated that the vessel steered well and the pilot's orders were accurately carried out. Just prior to the grounding he told the pilot that the vessel was going in a wrong direction, as there was a rock on the port side and the vessel was on the wrong side of the black gas buoy 51-Q. The second mate did not know the meaning of an ebb tide. The wheelsman stated that he had heard the second mate tell the pilot of the rock, and the pilot answered that it was a piece of wood with a gull on it. The pilot stated that he boarded the vessel without direct orders from the pilotage office, and although it was unusual he left the bridge for breakfast shortly after. The usual courses were steered until the buoy 51-Q was neared, which, having taken for the red buoy 52, he passed about 50 or 60 ft. to the north of. The error, he claimed, was due to a sore eye. In view of the evidence adduced and the antecedents of the pilot, Barthelemi Arcand, who stated that the accidents which happened to vessels which be piloted were so numerous that he did not remember the number, the Court felt bound, in the interest of all concerned, to cancel his license, and his license is hereby cancelled. The Court also felt it its duty to severely criticize the captain of the Saskatoon, William Honsberger, for the apparent lack of interest shown by him with regard to his responsibilities. As soon as the pilot took charge of the vessel he left the bridge, placing in charge with the pilot a man who signed on as second mate, but who does not possess a certificate, and who is therefore rendered irresponsible, and whose ignorance is so flagrant that be admitted he did not know the meaning of ebb and flood tide. The captain admitted that he was a stranger in the river, but was supposed to familiarize himself with the local conditions, yet he chose, on a fine day, having had sufficient rest, to go to his room, leaving his responsibilities as a master to rest on the pilot, whom he had never seen before, and on one who could not be considered responsible. Moreover, when the vessel grounded, he did not, apparently, think it of sufficient importance to take bearings of objects such as lighthouses or buoys, in order to ascertain the position of his vessel. Therefore the Court felt it incumbent upon it to suspend his certificate for one month, in order that he may be made to realize the importance and responsibility of his position as a master. The pilot claimed that the master used strong and insulting epithets towards him. Whilst the Court does not countenance such language, it thinks that under the circumstances no weight can be attached to the statement. The Court also unanimously agreed that the displacing of the buoy 51-Q by the tug Virginia and tow had nothing to do with the grounding of the Saskatoon, as the displacement occurred after the accident. The buoy was placed in its former position on the following day.

Additional Aid to Navigation by Wireless.

During a recent trip of the Canadian Northern Steamships s.s. Royal George a series of demonstrations were given as to the possibilities of a new wireless aid to navigation. The device is classified as a direction finder, and its duty is to seek out all wireless stations, whether stationary or not, on the coast line or on the high seas, within a radius of 50 miles, and to indicate, for the guidance of the navigating officers, the exact relation of the vessel to these, in terms of latitude and longitude. The present stage is not claimed to be more than experimental, but the results achieved on this trip are said to have been entirely satisfactory to those concerned. The instrument is said to have been accurate to a degree in detecting the compass direction of a number of stations on shore and afloat, among them being those at Cape Race, Cape Ray, Father Point, and on the steamship Columbia, 68 miles distant; Calgarian, 53 miles, and Sicilian, 18 miles.

The device is by no means bulky, the detector box, which is the medium for locating the stations, is just large enough to hold two small switches and a graduated dial fitted with a movable indicator. Connected with this box is the telephone box, equipped with a crystal of carborundum, which translates the wireless into an intelligible signal, through two receivers carried by the operator. The aerials, instead of being composed of several straight parallel wires, consist of two large wire triangles, so arranged that they cannot receive a message at the same time with the same strength. If one receives a message full strength, the other does not receive it at all, and if both receive it, the message is always stronger over one than the other. The position of the sending station is determined by the strength of the message as it is received over each triangle. These two wires are connected to the finder box by two switches. On this box is a dial marked in the degrees of a compass with a movable indicator. Half of this dial is affected by a message coming over one of the triangles, and the other half by the other triangle, so that the indicator is moved accordingly. When the current is at its strongest the indicator points to the direction of the sending station. To determine the point on the dial at which the message is strongest the operator moves the indicator first one way and then the other, noting the points at which the current disappears. The point midway between these two vanishing points gives the direction of the message. Emilio Ichino, of the Marconi companies, was in charge of the experiments, whicb were carefully watched by Capt. F. J. Thomson, commander of the s.s. Royal George. This is one of a number of experiments of various devices for aiding navigation which Canadian Northern Steamships, Ltd., has undertaken on its vessels. The company claims to have been the first to employ relay operators in order to secure continuous wireless telegraph service, and later it enabled Professor Barnes, of McGill University, to test his device for the detection of ice at sea, and since that time one of the company's captains has developed a highly efficient device for launching small boats at sea.

Responsibility for Proper Manning of Vessels.

A widow, at Collingwood, Ont., wrote the Mail and Empire as follows recently:—"I lost my husband in the lake disaster of Nov., 1913. The boat he was on was short of a crew and did not have a first mate. Is it a violation of the rules of navigation for a captain to sail without that officer? Is the company in any way responsible for the captain's neglect to procure a first mate before leaving port?"

The Mail and Empire's legal editor replied as follows: "The Canada Shipping Act (R.S.C. chap 113, sec. 97) says: 'No ship registered in Canada, over 200 tons tonnage, and no steamship registered in Canada, and allowed by law to carry more than 40 passengers, shall go on any coasting voyage or shall be licensed or allowed to ply in any Canadian water, unless such ship carries also a "mate" who has obtained a valid certificate of competency, or service as such mate, etc.' And sec. 98 says: 'No officer of the Customs at any port in Canada shall clear any such ship on any such voyage without such certificate being first produced to him.' And sec. 101 says: 'If such ship is required to carry a mate having a certificate of competency, the master shall at the same time produce to such officer of the Customs a certificate of such mate, etc.' There is a penalty of $100 for non-compliance with these requirements. But the act does not say in so many words that the heirs and personal representatives of a person who lost his life or property on any such ship shall have a right of action for damages on the ground that the ship was not properly manned. But the proof of that fact would be a material element in any such action for damages."

The Strandings of the Steamships Montfort and Saturnia.—These two cases, which were before Capt. H. St. G. Lindsay, R.N.R., when he was Dominion Wreck Commissioner, and in which the pilots concerned were found to blame, and their licenses suspended for three months, were again before the court at Quebec, July 16, on an order for rehearing. The counsel for the pilots, on finding that Capt. L. A. Demers, the newly appointed Dominion Wreck Commissioner, was not hearing the cases, but that Capt. Lindsay was to go over the matter once more, refused to proceed, on which Capt. Lindsay closed the hearing, the former judgments standing.

Shipping Report From Fort William.

F. & W. Jones, grain, vessel and marine insurance brokers, Fort William, Ont., wrote Aug. 15,—Arrivals of coal are keeping up—20 bituminous and 3 anthracite—although this is not up to the arrivals at this point last year. Unloading is very satisfactory, the managers doing all possible by co-operating with the vessel agents, working over time, etc., and facilitating dispatch generally. Only two boats have been held over Sunday and they were Saturday arrivals. Western rail shipments are increasing and will be quite up to normal by the end of the month, and docks are decreasing stocks as rapidly as Western demand will allow. The line up of enroutes is good, and it looks as if the last half of August will be better than the first half, as far as coal arrivals are concerned.

Shipments in grain since the last of July have fallen off steadily, there being only 19 cargoes shipped, two of which were screenings for Duluth. Seven cargoes were oats shipped by Canada for the use of the Imperial Government, the balance, 10 cargoes, were the only commercial grain shipped and were all loaded into Canadian bottoms. Stocks of grain at terminal elevators are very low, there being only 4,500,000 bushels of all kinds of grain, half of which is flax. By the time the new crop is running freely the elevators here will be practically empty. Receipts and shipments since July 31st, and stocks on hand at date are as follows:—

	Stocks.	Receipts.	Shipments.
Wheat ...	1,729,972	1,352,248	2,034,316
Oats	338,411	257,088	1,011,088
Barley ...	161,749	119,608	145,393
Flax	2,396,107	147,292	121,617

Reports from western provinces speak of harvesting being in active progress. Generally speaking weather conditions are unfavorable, but not more so than was expected, and no serious results have occurred or are anticipated. The estimate of the total crop is still a matter of conjecture, but prospects point to rather a better total than early predictions. We think it is safe to consider that there will be approximately a total of 200,000,000 bush. of the 1914 crop available for navigation movement. Everything points to a very heavy winter storage business, the unsettled conditions of the European continent must seriously affect export trade, while at the same time grain will probably be rushed to the terminals more than was at first anticipated, far in excess of elevator storage capacity, making storage in vessels a necessity, and probably much winter loading.

Owing to the war the grain elevators at Fort William and Port Arthur have been placed under an armed guard. This is merely to safeguard against damage which might be attempted by sympathizers of hostile forces, and in no way hinders the loading or dispatch of vessels. Masters and crews should report to their agent before coming up town, and secure pass to enable them to return to their vessels.

Lock Gate Accidents on the Welland Canal.

On July 27, the wooden steamboat Sarnor, of the Lake Erie and Quebec Transportation Co., a subsidiary of the Keystone Transportation Co., Montreal, while upbound to Ashtabula for coal, struck and carried out the two head gates of lock 8. The rush of water from above carried the vessel and the gates out into the reach below. The level above lock 8 is a short one, and the level below is about one mile long, consequently practically no water overflowed and there was no washing away of the banks. The vessel's steering gear was slightly damaged. It is stated that the cause of the accident was that as the vessel was entering the lock the engines were found centred when a signal to go astern was given, and when the engines were finally got going the engineer gave her speed ahead instead of reversing, breaking a 1¼ in. cable and a 5½ in. snub before striking the lock gates. Two spare gates were placed in position and navigation was resumed after an interruption of about 12 hours. It is estimated that the damage was about $4,000, fully covered by insurance.

Another accident occurred, Aug. 10, when the Montreal Transportation Co.'s wooden steamboat Windsor, upbound to Port Colborne, light, safely entered lock 12. One of the foot gates had been closed, and the other was about to be closed, when the helpers who are hired by vessels navigating the canal, through, it is said, a misunderstanding on their part, opened wide all the valves in the upper gates. The foot gate, which had not been closed, was caught by the current of water thus set up and could not be controlled by the lock operator, with the result that it crashed against the closed gate, mitering with it imperfectly. This sudden closing of the foot gates caused a surge in the lock which carried the vessel, which is full canal size, into the head gates, unmitering them. The rush of water from lock 12 reach carried them out and backed the vessel into the reach below, badly breaking the foot gates as she passed over them. The four gates were found wedged over each other between the lock walls in the lower recess. The canal banks at the head of lock 11 were badly washed out by the overflowing water, but the vessel was practically undamaged. Four spare gates were placed in position after navigation was interfered with for about 24 hours. The damage was estimated at about $8,000.

We are indebted to L. D. Hara, Acting Superintending Engineer, Welland Canal, for the details of the accidents.

A third accident occurred Aug. 23, when the steel s.s. John B. Ketchum 2nd, owned by the Spokane Steamship Co., and managed by the Reid Wrecking Co., Sarnia, Ont., while upbound from Toronto, light, struck the head gates of lock 6, spreading them so far that the weight of water from the level tore them loose, as well as one of the foot gates, carrying them, with the vessel, to the level below. The level above is not a long one, and consequently the damage to the neighboring land will not be heavy. The tent occupied by the military guard at lock 5 was flooded. It is stated that the accident was due to mistaken signals between the bridge and engine room, the engines going forward instead of reversing.

Atlantic and Pacific Ocean Marine.

Canada Steamship Lines, Ltd., announced Aug. 7, that conditions necessitated the discontinuance of the steamship service between Quebec and New York, which has been taken by its s.s. Trinidad.

The Cunard Co.'s s.s. Aurania, which is under construction at Wallsend on Tyne, Eng., is intended for the London-Canada service. She will be of the one class type, and will be propelled by geared turbine engines.

The International Mercantile Marine Co. has announced that it will inaugurate its Panama Pacific Line between New York and San Francisco, May 1, 1915. The steamships Finland and Kroonland will be utilized.

The s.s. Cienfugos, which was driven ashore near Louisburg, N.S., during a storm in the latter part of July, is reported to be a total loss. The vessel was en route to Montreal with lumber, and intended calling at Sydney for coal.

The British s.s. Sable I., en route from Glasgow, Scotland to Halifax, N.S., was picked up about 10 miles off Cape Race and towed to Halifax, at the end of July, having become disabled owing to the bursting of a high pressure cylinder.

The Royal Mail Steam Packet Co.'s s.s. Glengyle, intended for service between European and North Pacific ports, was launched in England during August. Her dimensions are, length 516 ft., beam 62.4 ft., depth 37.6 ft., and she has a deadweight capacity of 13,400 tons.

The International Mercantile Marine Co. will, early in 1915, establish a passenger and freight service, with the steamships Finland and Kroonland, between New York

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during July.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons		11,800	11,800
Grain	"	Bushels	1,722,371	2,881,677	4,604,048
Building stone	"	Short tons			
Flour	"	Barrels	285,120	909,210	1,194,330
Iron ore	"	Short tons	4,045,763	1,580,974	5,626,737
Pig iron	"	"		5,334	5,334
Lumber	"	M. ft. b.m.	2,407	74,809	77,216
Silver ore	"	Short tons			
Wheat	"	Bushels	6,997,153	2,912,852	9,910,005
General merchandise	"	Short tons	11,130	32,884	44,014
Passengers	"	Number	4,934	4,788	9,722
Coal, hard	Westbound	Short tons	56,066	375,127	431,193
Coal, soft	"	"	287,200	1,580,950	1,868,150
Flour	"	Barrels			
Grain	"	Bushels			
Manufactured iron	"	Short tons	15,854	18,509	34,363
Iron ore	"	"			
Salt	"	Barrels	17,724	42,413	60,137
General merchandise	"	Short tons	50,368	93,909	144,277
Passengers	"	Number	6,422	4,320	10,742
Summary.					
Vessel passages		Number	951	2,126	3,077
Registered tonnage		Net	2,921,890	3,864,335	6,786,225
Freight—Eastbound		Short tons	4,335,992	2,007,387	6,3
" —Westbound		"	412,020	2,074,857	2,4
Total freight		"	4,748,012	4,082,244	8,8

and San Francisco, via the Panama Canal, sailing every three weeks. The trip from New York to San Francisco will be made in 16 days, and the vessels will call either at San Diego or at Los Angeles, Cal.

It is reported that the C.P.R. is making some enquiries on the Clyde, which suggest that it is under consideration to place a contract there for the building of a vessel to replace the lost Empress of Ireland. The enquiries, it is said, are directed mainly to finding out the bearing which the general conditions of shipbuilding and the circumstances of the particular yards may be expected to have in the matter of cost and the probable date for delivery.

The wrecked s.s. Empress of Ireland, which was reported by divers to be lying on her side, as she sank, was stated recently to be slowly changing her position and attaining an upright position. As a result of this, the masts were reported to be, at low tide, only 35 ft. below the water level, and as this would constitute a menace to navigation, instructions were given to the divers to dynamite the masts. Marine Department officials have no definite views as to the cause of the change of position, but presume that the strong currents may have something to do with it. Capt. Walsh, Marine Superintendent, C.P.R., Quebec denied that there was any change in the position of the vessel or that she was a menace to navigation.

Maritime Provinces and Newfoundland.

We were officially advised Aug. 4, that the Prince Edward Island car ferry would be launched at Newcastle upon Tyne, Eng., Aug. 21.

Two bulk cargo steamships of 11,000 tons capacity are reported to be under construction at Sunderland, Eng., for charter to the Dominion Coal Co., Sydney, N.S. They are being built on the Isherwood system.

The light ship maintained on Lurcher Shoal, off Yarmouth, N. S., will be removed from her station on, or about, Sept. 1, to undergo necessary repairs, during which her station will be marked by a combined gas and whistling buoy, painted red and showing an occulting white light. The light ship will be off her station about four weeks.

The Reid Newfoundland Co.'s s.s. Invermore, which ran ashore near Brig Harbor Point in July, has been abandoned as a total loss. The company's s.s. Kyle, which was sent to investigate and report on the condition of the wreck, returned to St. John's with the information that nothing can be done in the way of floating the vessel. It was reported that a portion of the cargo had been salved, together with some of the ship's furniture. It is stated that the vessel was uninsured.

A press dispatch from Halifax, N.S., says that following on the agreement with the Canadian Government Railways for the taking over of the New Brunswick and Prince Edward Island Ry., an up to date ferry will shortly be placed in service between the main land and Prince Edward Island. It is presumed that this item has reference to the ferry service decided on a year or two ago, the construction of terminals for which is now proceeding at Cape Tormentine, N. B., and Carleton Point, P. E. I., and the vessel being under way in Great Britain. Full details of this work have already been given in various issues of Canadian Railway and Marine World.

The s. s. Storstad, which was held responsible for the loss of the C. P. R. s. s. Empress of Ireland in the St. Lawrence, at the end of May, has been fully repaired at Levis, and has returned to Sydney, to take up a renewed charter with the Dominion Coal Co. The officers and crew are the same as were in charge of the vessel before the disastrous collision. It is stated that the Storstad will, for the time being, carry coal between Sydney and Newfoundland, but may return to the St. Lawrence route later in the season.

At a sitting of the Dominions Royal Commission to enquire into the possibilities of the extension of trade between Great Britain and the Dominions and colonies, at St. John, N. B., Aug. 11, the Mayor stated that there was upwards of 12,000 lin. ft. of wharf frontage. The average run of tide there is 19.3 ft. The city spent $1,250,000 on wharf facilities on the west side. The Dominion Government is carrying out dredging operations on a large scale there, the contract for which was let in 1912 to the Norton Griffiths Co., amounting to approximately $7,500,000, and it is expected that the work would be completed in 1917. He also stated that there are no engineering difficulties in the way of dredging to give a depth of 40 ft. in the harbor. The city's capital expenditure for docks was about $2,000,000, and the Dominion Government has expended about $3,500,000 on improvements on the west side, but the amount of expenditures on the Courtenay Bay project is not available. The balance in the wharf finances is against the public, that is, the wharves do not pay for themselves. In 1913 exports were valued at $25,000,000. Upwards of 6,000 ft. of wharfage at the port had a depth of from 24 to 30 ft.

Province of Quebec Marine.

The name of the s.s. Bellona, registered at Montreal, no. 84,134, has been changed to Desola.

The work of widening the Rapide Plat Canal was reported completed July 29, when the contractors, Roger Miller and Sons, Toronto, commenced removing their plant.

The grain receipts at the Montreal Harbor Commissioners' elevators, from the opening of the navigation season, to Aug. 8, were 34,383,908 bush., which is considerably in excess of the corresponding period in any previous year.

The Gaspe and Baie des Chaleurs Steamship Co.'s s.s. Canada, which ran aground at Cape Chatte, near Matane, early in July, was released July 22 and taken to Quebec for examination and overhaul. The damage sustained was not serious.

The Gaspe and Baie des Chaleurs Steamship Co.'s s. s. Canada has been repaired at the Vickers dry dock at Montreal, after having been damaged by grounding at Cape Chatte. The damage was not so great as anticipated, some six or seven of her bilge plates having been set in.

It is reported that the Dominion Government has practically closed negotiations for a site for a new wireless telegraph station in the vicinity of Montreal, to replace the one at Tarte pier. The range will, it is said, be much wider than the present one, giving communication with Kingston, Ont., and Quebec.

St. Omer, Que., has been designated a port under part 12 of the Canada Shipping Act, the limits being all the waters of Chaleur Bay and the navigable portions of streams, ponds, etc., within the prescribed limits east of the west boundary of St. Omer Parish produced west of the east boundary of Carleton West Parish produced and north of the boundary between the provinces of Quebec and New Brunswick.

The harbor of Nouvelle, Que., has been designated a port under part 12 of the Canada Shipping Act. The limits of the port cover all the waters of Chaleur Bay and of the navigable portions of streams, ponds, etc., within the prescribed limits east of a line drawn due north and south astronomically through a point one nautical mile due west of the extremity of Maguacha Point west of the west boundary of St. Omer Parish produced and north of the dividing line between the provinces of Quebec and New Brunswick.

Ontario and the Great Lakes.

The Public Works Department received tenders, Aug. 31, for the construction of a wharf at Kensington, Algoma District.

The St. Lawrence and Chicago Steam Navigation Co.'s s.s. E. B. Osler ran aground in St. Marys River, Aug. 24.

The Star-Cole Line s.s. Huron ran ashore on Clapperton Island, Lake Huron, towards the end of July, and suffered considerable damage to her hull.

The Port Arthur Board of Trade has asked the Dominion Government to proceed immediately with the erection of a 5,000,000 bush. annex to the Government elevator there.

The salvaged s.s. I. W. Nicolas, wrecked in Nov., 1913, which has been purchased by Canadian interests and repaired, has been renamed Inland, and placed on the Canadian register.

The St. Lawrence and Chicago Steam Navigation Co.'s s. s. J. H. G. Haggerty, built at Collingwood recently, sailed for Detroit, Mich., Aug. 3, on her maiden trip. Capt. Williams is in command.

The outer and last crib of the extension to the west breakwater at Cobourg, was sunk on July 20, and the gas beacon has been placed 235 ft. back from the outer end of the west breakwater.

The Algoma Dredging Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital and office at Sault Ste. Marie, Ont., to carry on a general contracting and dredging business.

Canada Steamship Lines, on Aug. 18, removed its steamships Corona and Chicora from service for the balance of the season. The former was on the Niagara River route and the latter on the Olcott Beach route.

The s. s. Turret Chief, which was driven ashore and damaged during the storm of Nov., 1913, was offered for sale by the underwriters recently, but as no satisfactory bids were received, they are holding her for private sale.

An Ottawa press dispatch states that a new lock is to be built on the Trent Canal at Bobcaygeon to replace the present one, which is in a bad state of repair. The land has been purchased, and tenders have been called for.

Two clerks employed by Canada Steamships Lines, Ltd., were each fined $200 and costs, at Toronto, Aug. 10, for selling intoxicating liquors, without a license, on board the company's steamships Cayuga and Chippewa.

What is stated to be a new record for discharging grain to elevators, was reported from Port Colborne, recently, when the steamships J. T. Hutchinson and P. P. Miller, each with cargoes of 200,000 bush., were discharged in 10 hours.

The wooden s.s. J. H. Prentiss, which struck a reef on Manitoulin Island, July 16, and sank, has been released and taken to Sarnia, where she will be repaired. A hole

14 ft. long was cut in the bottom of the hull, and she sank in 25 minutes.

The Great Lakes Dredging Co.'s dredge Shuniah, which has been under rental to the Toronto Harbor Commission, in connection with its work in the Toronto harbor, sank at her moorings, Aug. 16, in 20 ft. of water. It is stated that a seacock was left open.

The Public Works Department has awarded dredging contracts, for work at Little Detroit River, to the C. S. Boone Dredging and Construction Co., at prices approximating $12,000, and for work at Bruce Mines, to the Soo Dredging Co., for approximately $6,975.

Plans are stated to have been filed with the Public Works Department, for the removal of the existing breakwater between the C. N. R. and Horne elevators at Port Arthur, and for the construction of another breakwater extending about 1,000 ft. further into the bay.

The back range light at Port Colborne has been removed from the east side of the entrance channel to the vicinity of the outer elbow on the west breakwater pier. When again placed in working order, it will be a red occulting light, to distinguish it from the town lights.

A recent press report from Kingston states that Canada Steamship Lines Ltd. is negotiating for the purchase of Garden Island, now owned by the Calvin Co. It is stated that the company proposes to use the island for a shipyard, where its western steamships may be quartered for the winter.

The dredge Tornado, under construction at Toronto for the Canadian Stewart Co., in connection with that company's contract with the Toronto Harbor Commission, for general harbor improvements, was launched from the Polson Iron Works, Aug. 15. She is similar in type to the Cyclone, launched from the same works in July.

The Keystone Transportation Co.'s s. s. Keynor, which arrived recently at the head of the Great Lakes, on her maiden trip from Sweden with wood pulp, has been placed in regular service on the Montreal grain route. She is a similar type of vessel to others owned by the same company, and was built at Londonderry, Ireland, and engined at Greenock, Scotland.

A. C. Lewis, Secretary, Toronto Harbor Commission, is reported to have stated recently, that the work on the harbor improvements is to be continued in accordance with the plans laid out at the commencement of the season. Approximately $1,400,000 will be spent on reclamation work, pile driving, piers and the excavation of the ship channel in Ashbridges Bay.

The Westerian Transportation Co., Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital, and office at Ottawa, Ont., to carry on a general steamship owning and passenger and freight transportation business. The incorporators are, J. H. Hall, R. T. Holcomb, E. Hall, Ottawa; A. Lefebvre and E. Amyot, Valleyfield, Que.

Canada Steamship Lines s. s. W. Grant Morden, which went into service, May 9, has been carrying some record breaking cargoes. On her first trip she carried 419,000 bush. of grain to Port Colborne, and as a return cargo had 12,168 tons of coal, and her last trip in May was with 538,558.20 bush. grain. In all return trips she has carried from 12,000 to 12,500 tons of coal or ore.

A press dispatch from Windsor states that before the fall the harbor planned by the Dominion Government in response to the request of the navigation interests at Leamington, will be ready for vessels drawing not more than 25 ft. Soundings are being made, and it is expected that a breakwater will be built for about 300 ft. into the lake to the west of the present dock, thus forming a commodious and safe haven for vessels during bad weather.

P. Paton, Assistant Operating Superintendent Passenger Steamers, Canada Steamship Lines, Toronto, announced, Aug. 15, that intoxicating liquor will not, in future, be sold on the company's vessels operating out of Toronto. It has been the custom for several years to supply it on the company's vessels, when called for, and it has also been customary for the license officials to prosecute the captains, and exact fines and costs, towards the end of each season.

A syndicate is reported to have been formed, composed of Windsor and Detroit men, with the object of locating and, if possible, salving the car ferry Marquette and Bessemer No. 2, which foundered during a storm, Dec. 9, 1909, when en route from Conneaut, Ohio, to Port Stanley, Ont. The vessel was valued at $50,000 and the cargo at $35,000. H. L. Drake, P. D. White, Windsor; E. L. White, St. Thomas; and W. C. Moore, Detroit, are said to be interested.

Bassett Steamship Co., Ltd., has been incorporated under the Ontario Companies Act, with $100,000 capital, and office at Toronto, to own and operate steam and other vessels. Capt. Bassett, who is chiefly interested in this company, was formerly connected with the Western Steamship Co., Toronto, which owned the steamships J. A. McKee and Wexford. The former was sold recently to the Algoma Central Steamship Line, Sault Ste. Marie, Ont., and the latter was lost in the Great Lakes storm of Nov., 1913.

The U. S. Lake Survey reports the levels of the Great Lakes in feet above tidewater, for July, as follows:—Superior 602.68; Michigan and Huron 580.74; Erie 572.83; Ontario 246.72. Compared with the average July levels for the past ten years, Superior was 0.18 ft. above; Michigan and Huron 0.38 ft. below; Erie 0.07 ft. below, and Ontario 0.035 ft. below. It was anticipated that during August, Superior would rise 0.2 ft.; Michigan and Huron fall 0.1 ft.; Erie 0.2 ft., and Ontario 0.3 ft.

Referring to a recent press dispatch from Cobourg, which stated that a contract had been made between the G.T.R. and C.P.R. to bring in coal for the latter company, by the Ontario Car Ferry Co.'s car ferries, and that in addition to the second car ferry now being built, a third car ferry, not to carry passengers, will also be built, we are officially advised that this is merely a rumor arising from the fact that the Ontario Car Ferry Co. is having a second car ferry built by Polson Iron Works, Toronto. A description of this vessel has already been given in Canadian Railway and Marine World.

The Windsor and Pelee Island Steamship Co.'s steamboat Pelee, which was built at Collingwood, this year, is under lease to the Windsor, Detroit and Wallaceburg Steamship Line, until the middle of September. The proprietor of the line is H. B. Smith, Windsor, Ont., who it is said proposes to incorporate a company early in the new year, and to build a steel steamship at an approximate cost of $150,000. He is also said to be considering the possibility of chartering a vessel to carry freight during the winter between Sarnia, Amherstburg, Dresden, Sandwich and other ports.

Owen Sound press reports state that F. F. Wood of Niagara Falls, Ont., who controls a charter for a dry dock at Owen Sound, and who has received local assurance of a subsidy under certain conditions, has assigned two-thirds of his interest in the project to New York capitalists. He is reported to have stated originally, that he had sufficient English capital in sight to build the dock, and though local interests are not impressed with the latest move on the promoter's part, they are awaiting developments, before committing the present scheme to the place where previous Owen Sound dry dock schemes have gone.

The Lake Carriers' Association has engaged in a campaign for the elimination of collisions in the open lake owing to fogs. The association has already decided that all vessels enrolled in the association shall follow separate courses on the Great Lakes, eastbound vessels taking an outside course and westbound vessels an inside course. This rule has not been observed strictly, and a number of collisions have occurred, all being head on collisions, there being no instance of a head to stern collision on the lakes during a fog. The matter is being taken up strongly by owning companies, and the safety factor is being impressed on the masters, it being pointed out that quick passages regardless of safety are not desired, and are only desired when the weather is clear and fair.

In 1912, the Montreal Transportation Co. ordered a vessel in England, with propelling machinery of a distinctly new order for which the inventor and designer claimed a great deal. The principle was a combination of Diesel engine and electric motors coupled direct to the propeller shaft, and was fully described in Canadian Railway and Marine World for Nov., 1912. On her trial trips she proved a failure, and the M. T. Co. declined to accept her. A second series of trials proved no more successful, and the propelling machinery was removed and replaced by an ordinary steam equipment. She sailed from England July 9, and took 19 days in crossing. She is of the ordinary type of lake vessel, and is of the following dimensions,—length between perpendiculars 250 ft., length overall 256 ft., breadth extreme 42½ ft., depth moulded 19 ft., and she has a speed of about 10 knots an hour. She was originally named Tynemount, but later her name was changed to Port Dalhousie.

The French River and Nipissing Navigation Co., with its steamboats Elgin L. Lewis, Highland Belle and Northern Belle, and a houseboat, Dundonald, has been acquired by F. E. Macdonald, Newcastle, Ont. The Elgin L. Lewis was built at Orillia, Ont., in 1904, and is screw driven by engine of 6 n.h.p.; dimensions—length 70 ft., breadth 12.3 ft., depth 5 ft.; tonnage, 50 gross, 30 register. She has not yet been placed on a regular route for this season. The Highland Belle was built at Orillia in 1900, and was originally named Van Woodland. She is screw driven by engine of 3 n.h.p., and is of the following dimensions: length 75 ft., breadth 16.8 ft., depth 5.2 ft.; tonnage, 50 gross, 31 register. She runs on a daily schedule out of Sturgeon Falls, three times a week up the west arm of Lake Nipissing to Monetteville, and three times a week to French River and Chaudiere Falls, with J. Hicks as captain and A. Major as chief engineer. The Northern Belle was built at Sturgeon Falls in 1905, and is screw driven by engine of 30 n.h.p. Her dimensions are: length 104 ft., breadth 21.6 ft., depth 7.6 ft.; tonnage, 222 gross, 169 register. She is operated daily from North Bay to the French River and Chaudiere Falls, with A. McKenney captain and J. Coventry as chief engineer. H. H. R. Macdonald, Sturgeon Falls, Ont., is Manager of the company.

Manitoba, Saskatchewan and Alberta.

Regarding the various schemes for making the Saskatchewan River navigable for freight and passenger vessels, between Lake Winnipeg and Edmonton, it has been proposed to increase the flow of water, by diverting the overflow of the northern lakes and streams which feed them, in a southerly direction. The proposals are considered quite feasible, covering a cutting from Green Lake to Crooked River, diverting the Beaver River and also the outflow from Lac la Ronge and Isle a la Cross Lake, as well as Green Lake, southerly through Devils Lake to Shell River and thence to the Saskatchewan River near Prince Albert. Various surveys which have been made from time to time, show that the low water, coupled with the innumerable sandbanks, are at present the chief obstacles to overcome in making a properly navigable waterway.

The Hudson Bay Co., which has been in the transportation business practically ever since 1670, has, this season, issued its first time table. All its service, which covers thousands of miles of river, lake, ocean and land, is operated from Athabasca, the terminus of the Canadian Northern Ry. branch running straight north from Edmonton, Alta. The s.s. Athabasca is run from Athabasca to Mirror Landing, whence there is a drive of about 16 miles to Salteaux Landing, from which point the s.s. Slave River is run to Grouard. From Grouard there is a drive of about 90 miles over an excellent trail to Peace River Crossing, whence the s.s. Peace River runs up and down stream, easterly to Fort Vermilion and The Chutes, and westerly to Fort Dunvegan, Fort St. Johns and Hudson's Hope. From Athabasca North, down stream on the Athabasca River, the scow Transport runs to McMurray, 252 miles, and the s.s. Grahame from McMurray to Fort Chipewyan, Smith's Landing and The Chutes, at the Peace River. Sailings from Smith's Landing northerly are also made at intervals for both passengers and freight. The complete route from Athabasca to Fort McPherson, on the Mackenzie River route, covers 1,854 miles, the fare for the complete distance being $103 down, and $133 up.

British Columbia and Pacific Coast Marine.

The C.P.R. recently arranged for a series of six special cruises to Alaska through the Inside Passage.

The Grand Trunk Pacific pier at Seattle, Wash., was destroyed by fire at the end of July. Arrangements have been made for the company's vessels to use no. 2 pier.

The G. T. Pacific Coast Steamship Co.'s s.s. John struck a log when leaving Ikeda, recently, and broke two of her propeller blades. The damage was subsequently repaired at Victoria.

A press report from Victoria states that the Board of Trade received a communication from the U. S. Government recently, to the effect that no duty will be charged on repairs done to U. S. vessels in Canadian ports.

The dredging of the new channel from the Gulf to the Fraser River has been completed, and the sandheads light ship and the buoys marking the old channel will shortly be removed to the new channel. It is stated that the new channel is from 18 to 20 ft. deep at low water, and lies about half a mile north of the old one.

Capt. F. Turner, of the Empire Stevedoring Co., Vancouver, B.C., died at his home there, Aug. 18, after a very short illness, aged 40. He was for several years in the service of the shipping firm of Andrew Weir and Co., and commanded several of the vessels for which that company acted as agent, the last being the Levernbank.

The Dominion Shipbuilding, Engineering and Dry Dock Co.'s projected plant at Vancouver, it is reported, will eventually comprise seven large building slips, a 1,000 ft. graving dock, machine shops, and a fresh water basin. The Lonsdale estate, comprising about 100 acres with a frontage of 1,400 ft. on Burrard Inlet, is reported to have been acquired.

Negotiations are proceeding with the Puget Sound Navigation Co. for the establishment of a steamship service between Anacortes, Everett, Bellingham, Vancouver and Victoria. It is reported that the company, before committing itself to the proposal, desires to know what likelihood there is of business sufficient to warrant the service, but in any case, nothing can be done until next season.

The Pacific Coast Steamship Co.'s s.s. Curacoa, which was wrecked at Warm Chuck, Alaska, June 21, 1913, has been raised by the Vancouver Dredging and Salvage Co., and taken to Vancouver. When she sank, she had on board, 800 tons of coal, and 750 tons of general cargo. The wreck was located in 78 ft. of water low tide with a tidal range of 15 ft. Her dimensions are, length 257 ft., breadth 38 ft., depth 17.5 ft.

The s. s. Princess Irene, sister vessel of the s. s. Princess Margaret, launched recently for the C. P. R. British Columbia Coast service, at Dumbarton, Scotland, was expected to be launched during August. The equipment of the Princess Margaret is proceeding rapidly, but as the contract time for delivery on the coast is not until early next year, it is stated that this will not he rushed. It was announced a short time ago that both vessels would leave the Clyde early in November for Victoria, by way of the Panama Canal.

It is reported that up to the end of July, the amount of dredging done by the Dominion Government in connection with the Vancouver harbor improvements, covers the removal of 1,700,000 cubic yards of material from the First Narrows, in addition to the clearing away of the Parthia Shoal, and the dredging of a deep water channel in Coal Harbor. Over 1,250,000 cubic yards of material has been taken out of False Creek. The channel at the First Narrows is to be widened to about 1,400 ft., the fair way at present being only about 450 ft.

An inquiry has been held at Vancouver into the collision between the West Vancouver ferry Doncella and the West Vancouver No. 5, in Vancouver Narrows, July 4. Capt. J. D. Macpherson acted on behalf of the Dominion Wreck Commissioner, and was assisted by Capt. Copp and Commander Union, as nautical assessors. The judgment stated that the collision was due to the careless and reckless manner in which P. H. Johnson, master of the West Vancouver No. 5, handled his vessel, and pointed out that the number of complaints that have been made to the harbor officials, show that reckless navigation by many small vessels using the dangerous tidal of the Narrows, has been going on for a considerable time, and as a deterrent, Johnson's certificate was suspended for three months. The master of the Doncella, D. Smith, was absolved from blame, so far as the actual impact was concerned, but censured for not reducing speed earlier and dropping astern, when he saw what the tactics of the other vessel were, and he was warned to be more careful in the future. The Court also suggested that the ferry managements should so arrange their schedules so that no two vessels should leave at the same time, as such a practice is a strong incentive to racing.

Furness, Withy and Co.'s Report for the year ended Apr. 30, shows profits, including the balance brought forward, of £765,488 12s 11d. After charging directors' fees and income tax there remains £751,949 9s 7d. The usual half yearly dividend on the preference shares was paid Nov. 1, 1913, and three quarterly dividends on the ordinary shares at 10% free of income tax were also distributed, leaving an available balance of £566,639 5s 11d, out of which £350,000 was transferred to depreciation account. The balance was disposed of, as follows:—Preference share dividend at 5%, paid May 1, £35,310 3s 8d, ordinary share dividend at 10% paid May 1, £50,000, carried forward to current year's accounts £131,329 2s 3d. The directors continued the policy of disposing of the older vessels of the fleet, and during the year sold several at satisfactory prices. These vessels are gradually being replaced by new tonnage, specially adapted to the requirements of the various trades. The company has secured an interest in the Johnston Line, Ltd., Liverpool, which the directors feel sure will prove valuable. The company operates vessels to various parts of the world, including Montreal, and the balance sheet includes in the assets an investment of £150,000 in the British Maritime Trust, Ltd., which represents its interest in Canada Steamship Lines, Ltd.

La Compagnie de Navigation St. Laurent-Richelieu, the incorporation of which was announced in our last issue, is reported to have purchased the following steamboats, Terrebonne, R. Paul, Ferdinand, and a steam tug and three barges. It is stated that the Terrebonne will sail from Montreal each Tuesday and Friday, for Sorel, St. Denis, Beloeil and intermediate points, the R. Paul on each Monday, Thursday and Saturday for Varennes, Vercheres, Sorel and St. Joseph de Sorel, and the Ferdinand between St. Tours and Beloeil. The Terrebonne, recently owned by Capt. A. Lamothe, St. Denis, and formerly by the Richelieu and Ontario Navigation Co., was built at Sorel in 1871 and practically rebuilt there in 1895. She is a paddle wheel vessel with engine of 28 n. h. p. Her dimensions are length 156.2 ft., breadth 24.1 ft., depth 7.2 ft.; tonnage, 636 gross, 320 register. The R. Paul was owned by A. Guertin, St. Charles, and was built at Sorel in 1911. She is screw driven by engine of 2 n. h. p., and is of the following dimensions,—length 80 ft., breadth 18 ft., depth 4.6 ft.; tonnage, 61 gross, 28 register. The Ferdinand was owned by Capt. F. Fecteau, St. Antoine, and was built at St. Antoine in 1905. She is screw driven by engine of 28 n. h. p., and her dimensions are, length 87 ft., breadth 17.6 ft., depth 5.4 ft.; tonnage, 76 gross, 48 register.

Comparison of Welland Canal Statistics.—Following are statistics from the American Railroad Journal, Feb. 14, 1835, relating to traffic on the Welland Canal in 1834:—Number of vessels passing through the canal, 570 schooners, 334 boats and scows and 66 rafts; total all vessels, 970, with a total tonnage of 37,927; tolls, approximately, $21,500; total expenditure on the canal, including 1834, approximately, $1,800,000. These figures compare with those for the season of 1913 as follows:—Number of vessels passing through the canal, steam 2,867, sailing 362, total all vessels 3,229; total tonnage, 3,164,530; system of tolls abolished; total expenditure on canal, including 1913, $29,250,951.01.

Canadian Notices to Mariners.

The Department of Marine has issued the following:—

230. July 8. Ontario, Lake St. Clair, Thames River front range light, change in illuminating apparatus.

231. July 8. Ontario, River St. Mary, westward of Vidal shoals, gas buoy established at junction of channels.

232. July 8. United States of America, Lake Superior, off Presque Isle Point, and Marquette, uncharted shoals.

233. July 18. Prince Edward Island, southeast coast, Cape Bear, temporary light.

234. July 18. Quebec, Restigouche River, Battery Point to Campbellton, change in positions of buoys.

235. July 18. Quebec, River St. Lawrence, eastward of Orleans Island, change in characteristic of lights shown from gas buoys placed temporarily for dredging purposes.

236. July 20. Ontario, Lake Superior, Slate Islands, change in character of light, fog alarm established.

237. July 21. New Brunswick, south coast, Bay of Fundy, Martin Head, lighthouse established.

238. July 21. Prince Edward Island, south coast, Northumberland Strait, off Carleton Head, gas buoy placed.

239. July 21. Canada, caution with regard to sweeping operations.

240. July 21. Ireland, west coast, Great Skellig Island, fog signal established.

241. July 22. New Brunswick, Bay of Fundy, Campobello Island, Head Harbor, fog bell to be discontinued, intended change in position and character of fog alarm.

242. July 22. Nova Scotia, Bay of Fundy, Brier Island, northwest ledge, intended change in position of gas and whistling buoy, submarine bell buoy to be established.

243. July 22. Nova Scotia, Bay of Fundy, Lurcher shoal, light ship to be removed from her station, temporarily, for repairs.

244. July 24. Nova Scotia, south coast, off entrance to Owls Head harbor, bell buoy to be established.

245. July 24. Nova Scotia, Cape Breton Island, Bras d'Or Lake, East Bay, buoys established.

246. July 24. New Brunswick, Miramichi River, Bras d'Or Lake, East Bay, buoys range lights established.

247. July 24. Ireland, south coast, Port of Cork, White Bay, leading lights and light buoy established.

248. July 25. Ontario, Lake Ontario, Cobourg harbor, extension to west breakwater, information.

249. July 25. Ontario, Lake Erie, Port Colborne, intended change in position of back range light, caution.

250. July 25. Ontario, Lake Huron, Southampton, gas buoy replaced by gas and bell buoy.

251. July 25. Ontario, Georgian Bay, east side, Waubune Channel, Lone Rock, gas and whistling buoy replaced by gas and bell buoy.

252. July 25. Ontario, Georgian Bay, east side, Byng Inlet approach, westward of Maganatawan ledges, gas buoy replaced by gas and whistling buoy.

253. July 27. Quebec, River St. Lawrence, Lake St. Francis, Coteau Landing, light on wharf to be shown from gas beacon.

254. July 27. Ontario, Georgian Bay, east side, Giants Tomb Island, change in character of light.

255. July 29. Nova Scotia, west coast, submarine fog bell off Cape Fourchu discontinued, submarine bell buoy to be established near Yarmouth gas and whistling buoy.

256. July 29. Quebec, River St. Lawrence, below Quebec, Empress shoal, gas buoy established, change in position of gas buoy.

257. July 30. Quebec, River St. Lawrence, Lake St. Louis, buoy established northwestward of Chateauguay lightship.

258. July 30. Quebec, Ottawa River, Lake of Two Mountains, Graham, front range light raised.

259. July 30. Ontario, Lake Ontario, Niagara River mouth, Niagara-on-the-Lake, change in characteristic of fog alarm.

260. July 30. Ontario, Georgian Bay, approach to Midland, eastward of Elimere Point, McNicoll back range lighthouse, slats placed in skeleton frame.

261. July 30. Ontario, Georgian Bay, east side, Roberts Island, Honey Harbor channel, light established on Turning Rock beacon, buoy established.

262. Aug. 4. British Columbia, Vancouver Island, east coast, Baynes Sound, Base Flat, Union Spit, beacons to be replaced by platform buoys.

263. Aug. 4. British Columbia, Chatham Sound, Metlakatla harbor, change in character of buoys.

264. Aug. 5. British Columbia, Strait of Georgia, Fraser River entrance, change in positions of buoys and lightships.

265. Aug. 5. British Columbia, Grenville channel, Yolk Point, day beacon erected.

266. Aug. 5. British Columbia, Grenville channel, entrance to Lowe Inlet, Tom Island, day beacon rebuilt.

267. Aug. 5. British Columbia, Skeena River, Middle passage, Kennedy Island, eastward of Georgy Point, day beacon erected.

268. Aug. 6. Canada, information and regulations relating to war conditions, warnings to mariners.

269. Aug. 6. New Brunswick, Bay of Fundy, Grand Manan Island, uncharted shoal between Green Islands and Big Wood Island.

270. Aug. 6. Nova Scotia, south coast, approach to Halifax, northward of inner gas and whistling buoy, electrically operated submarine fog bell discontinued, submarine bell buoy to be established.

271. Aug. 7. Ontario, Lake Huron, Goderich north breakwater, description of light, alteration to beacon, fog alarm established, fog whistle on Goderich waterworks building discontinued.

272. Aug. 11. Ontario, Detroit River, Limekiln Crossing range lights established, Texas dock eastern and western range lights to be discontinued, old range lights at Bois Blanc Island to be discontinued.

273. Aug. 11. Detroit River, Livingstone Channel, gas buoys established, buoys moved.

274. Aug. 12. Ontario, Georgian Bay, Penetanguishene harbor, dredging, buoyage, lights.

275. Aug. 15. Quebec, Ottawa River, Vaudreuil, change in position of back range beacon.

276. Aug. 15. Ontario, Ottawa River, South Nation River mouth, buoys established.

277. Aug. 15. Ontario, Bay of Quinte, Picton, buoys established.

278. Aug. 15. Ontario, Lake Ontario, Toronto harbor approach, bell buoys placed, gas buoy placed.

279. Aug. 15. Ontario, Georgian Bay, Thornbury, bearing of range lights.

280. Aug. 15. Ontario, Georgian Bay, east side, Waubune channel, southwestward of Oak Island, uncharted rock, intended change in position of buoy.

281. Aug. 15. Canada, warning, British ships must show their colors when signalled.

282. Aug. 18. Nova Scotia, south coast, approach to Halifax, War channel buoyed from Neverfail shoal to seaward for use of all shipping, warning to mariners.

283. Aug. 18. Nova Scotia, south coast, Halifax harbor, Lighthouse bank, conical buoy replaced by gas buoy.

284. Aug. 18. Nova Scotia, south coast, Halifax harbor, Mauger Beach, fog alarm temporarily discontinued.

285. Aug. 19. Nova Scotia, Bay of Fundy, Minas Basin, Burntcoat, new lighthouse.

286. Aug. 19. Nova Scotia, south coast, Beaver harbor, Beaver Point, light pole replaced by lighthouse, change in color of light.

287. Aug. 19. Quebec, Gulf of St. Lawrence, Natashkwan Point, lighthouse established.

288. Aug. 20. Nova Scotia, Bay of Fundy, Grand Passage, Bald Rock, spindle erected.

289. Aug. 20. Quebec, River St. Lawrence, Point des Monts, change in character of light.

290. Aug. 20. Quebec, River St. Lawrence, ship channel between Quebec and Montreal, above Ile St. Ours, Petite Traverse, spar buoys replaced by conical buoys.

291. Aug. 20. Quebec, River St. Lawrence, below Montreal, Lanoraie to Varennes, Repentigny Channel to be used by light draught vessels.

292. Aug. 20. Quebec, River St. Lawrence, Repentigny Channel, Ile Lebel, front range lighthouse decreased in height.

The Demand for Lakes Tonnage.—In his introduction to the recent issue of Beeson's Marine Directory, the publisher says,—"Navigation for the season of 1914 opened very slowly, in fact as far as any urgent demand for any class of tonnage, there was practically none. The boats of a few of the largest companies were finally got into commission by about June 15, but as we go to press, June 25, there are fully 30% of the lake tonnage entirely idle, most of which has not been fitted out this spring. There is little prospect of any great increase of tonnage unless the enormous grain crops about to be harvested are moved very freely before Dec. 1, which would help the situation some, and it is possible with the adjustment of eastern rail freight rates, which is expected early in July, that an increase in movement in iron ore may take place." The statement that fully 30% of the lake tonnage was entirely idle at the date named, must be taken as applying to U. S. tonnage only, as, although it may be admitted that cargoes have not, generally, been up to the level of last season, it cannot be said that any such proportion of Canadian tonnage has been idle even at so early a point in the season as that indicated. The statement of Jas. Carruthers, President, Canada Steamship Lines, Ltd., the company controlling the largest number of Canadian vessels engaged in the Great Lakes service, and published in Canadian Railway and Marine World for July, announced that well before the end of June, all of the vessels in the company's service were in operation.

A reflector, somewhat similar to the type used on automobiles, has been applied to the observation end of a private car recently built in the U.S. It is made so as to fold in flat with the side of the car, and is useful in enabling the people in the car to see ahead of the train by looking out of the car window.

A New York report states that the Interstate Commerce Commission has promised to act as soon as possible on the request that the G.T.R. be allowed to run boats between Providence and New York or Philadelphia. The petition from Providence is supported by one from the Central Vermont Ry., a G.T.R. subsidiary.

Among the Express Companies.

S. O. Martin has been appointed agent, Canadian Northern Ex. Co., Ottawa, Ont.

C. Potter has been appointed agent, Dominion Ex. Co., Revelstoke, B. C., vice J. D. Dickie.

A. F. Schussler has been appointed agent, Canadian Northern Ex. Co. at Brockville, Ont.

J. J. Gardiner has been appointed agent, Canadian Northern Ex. Co. at Smiths Falls, Ont.

J. C. Bennett has been appointed cashier, Dominion Ex. Co., Nelson, B. C., vice J. H. Whitehouse.

J. Donaldson has been appointed acting agent, Dominion Ex. Co., Port Arthur, Ont., during the absence on leave of T. Gray.

J. J. Stinn has been appointed chief clerk, Dominion Ex. Co., Regina, Sask. He was formerly in the company's Winnipeg office.

The Canadian Northern Ex. Co. has opened an office at Ashern, Man., and has closed its offices at Deerfield and Grays, Man.

J. S. Mooney, heretofore agent, Canadian Ex. Co., Sherbrooke, Que., has been appointed joint agent there, of the Canadian Ex. Co., and American Ex. Co.

The Board of Railway Commissioners has extended the express collection and delivery limits in Winnipeg beyond those defined in the Board's order 18413, Dec. 31, 1912.

W. S. Martin, formerly agent, Dominion Ex. Co., Portage la Prairie, Man., has been appointed cashier, Dominion Ex. Co., Regina, Sask., vice T. E. Thackerey, who was recently drowned while on a canoe trip.

The Dominion Ex. Co.'s service has been placed in operation over the Campbellford, Lake Ontario and Western Ry. between Glen Tay and Agincourt, Ont., which is being operated by the C. P. R., with offices at Bowmanville, Brighton, Cobourg, Crow Lake, Grafton, Newcastle, Port Hope, Shannonville, Trenton and Wilkinson.

J. A. D. Vickers, who has been acting as Vice President and General Manager, American Ex. Co., Chicago, Ill., since the appointment of G. C. Taylor as President, entered express service in Canada, under his father, who founded the Vickers Ex. Co., and he was appointed Superintendent of that company in 1882. On the absorption of the Vickers Ex. Co. by the American Ex. Co., he was appointed Superintendent of the Canadian Division, American Ex. Co., and in 1891 was appointed Superintendent of the National Ex. Co.'s lines in the west, with offices at Chicago, Ill. He was appointed General Superintendent, July 1, 1905, and subsequently General Manager, which position he held until his recent appointment.

The British Columbia Express Co., with head office at Ashcroft, is reported to have gone into liquidation. It was founded by F. J. Barnard in 1862, and was popularly known as B.X., which has continued ever since. The company had a Government mail contract, conveying mails from Ashcroft on the C.P.R., to all points in the northern interior of the Province, with Fort George as the present northern terminus. During the summer months the service was performed by automobiles, horse stages and steamboats, and during the winter months by automobiles, horse stages and sleighs. The company operated over 900 miles of stage lines, with over 200 stage horses on the main lines, the horses being distributed in relays throughout the country, and changed at distances of about 16 miles. Four and six horse teams were driven and a regular schedule of 6 miles an hour maintained by the stage coaches. The company's rolling stock consisted of all kinds of conveyances from a two horse thoroughbrace jerky to six horse Concord stages, passenger sleighs and automobiles, all of these, with the exception of the automobiles, being manufactured in the company's own shops at Ashcroft and 150 Mile House. A regular express business was conducted in northern British Columbia, connecting with the Dominion Ex. Co. at Ashcroft. The s.s. B.X. was placed in service in 1911 to run between Soda Creek and Fort George on the Upper Fraser River. This vessel was specially designed and built for the service, and specially engined with large power to enable her to run the Cottonwood and Fort George Canyons. It is announced that the business is being taken over by the Inland Express Co.

Telegraph, Telephone and Cable Matters.

James Clark, heretofore agent, C.P.R. Telegraphs, Saskatoon, Sask., has been appointed agent at Regina, Sask.

The Great North Western Telegraph Co., on Aug. 19, opened a telegraph service to Calgary, Alta., in conjunction with the Canadian Northern Telegraph Co.

D. W. Hyndman, heretofore agent, C.P.R. Telegraphs, Edmonton, Alta., has been appointed agent at Saskatoon, Sask., vice James Clark, transferred to Regina.

The C.P.R. has decided that the title of the official in charge of a telegraph office, will be that of agent. The title of manager, or local manager, hitherto applied to such officials is to be discontinued.

Sir William Marconi, G.C.V.O., was recently honored by King George with the Grand Cross of the Royal Victorian Order (honorary), thus signalizing his achievements with wireless telegraphy.

J. B. Sheldon, Superintendent of Telegraph, Union Pacific Rd., Omaha, Neb., who died there recently, aged 54, was a native of Canada, and was President of the Association of Railway Telegraph Superintendents for the year 1912-13.

The Dominion Government is arranging for the commencement of the work of erecting the telegraph line from Athabasca, Alta., to Lac la Biche. Work is also proceeding on the McMurray line, which has been completed to about 70 miles from Athabasca.

The Pacific Cable Board is reported to have arranged for the laying of a second cable from Bamfield to Port Alberni, an underground cable from Port Alberni to Parksville and a submarine cable from Parksville to Nanaimo, making connection with the cable from Nanaimo to Vancouver.

The Great North Western Telegraph Co. has extended the use of the Morkrum tape automatic printers, and is now operating circuits between Toronto and Montreal, Toronto and Buffalo, Toronto and New York, Montreal and New York and Montreal and Quebec.

The C.P.R. telegraph system, which was opened for public business in September, 1886, had, at the end of that year, 4,525 miles of poles, 14,506 miles of wire and 435 offices, and transmitted 567,840 messages. At the end of 1913, there were 13,800 miles of poles, 102,600 miles of wire, 1,400 offices, and about 5,000,000 messages were transmitted.

The Marconi International Marine Communication Co. reports that it has 873 vessels fitted with wireless telegraphy, as compared with 580 at the end of 1912, and 788 at the end of 1913. The receipts from ships' telegrams, news service, subsidies, rentals, etc. during the past year, were $731,580, as compared with $501,610 for the preceding year.

The Great North Western Telegraph Co. has opened offices at Inch Arran House, Dalhousie, N. B., Burnt River, Clifton House, Niagara Falls, and Manotick, Ont., Little Metis, Manoir Richelieu Pointe au Pic, and St. Agnes, Que., and has closed its offices at Petawawa Camp, Ont., and Ste. Adelaide de Pabos, Que.

C. E. Davies, who was recently appointed Traffic Superintendent, Great North Western Telegraph Co., Toronto, was born at Hot Springs, Ark., Oct. 4, 1881, and entered Western Union Telegraph Co.'s service at Helena, Mont., as a messenger, in 1896. He became an operator in 1899, and on Jan. 1, 1906, was appointed chief operator, G.N.W. Telegraph Co., at Ottawa, Ont. On Sept. 20, 1909, he was appointed local manager there, and in Nov., 1911, was also appointed supervisor of equipment.

It was announced at Ottawa recently that the Dominion Government is erecting a new wireless telegraph station at Cape Race, which will practically double the radius of the present station, and make Cape Race the first point of land communication for all vessels using the North Atlantic route. The new equipment will have a radius of at least 500 miles instead of about 250 at present. It was expected that the towers would be ready for operation before the end of August.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Canadian Westinghouse Co., Ltd., has opened a branch office at 203 Hardisty St., Fort William, Ont.

Canadian General Electric Co., Ltd., Toronto, has issued bulletin A 4199 on railway motor gears and pinions.

Canadian General Electric Co., Ltd., Toronto, has issued bulletins 54,562 and 54,563 relating to parts of air brake equipment.

Canadian Allis-Chalmers, Ltd., Toronto, is distributing a catalogue of Tate flexible staybolts, for which it is agent in Canada.

Flannery Bolt Co., Pittsburg, Pa., has issued its 1914 catalogue of the Tate flexible staybolt and tools for installation, 30 pages, 8½ by 11½ ins., illustrated.

National Steel Car Co., Ltd., Hamilton, Ont., is building an extensive addition to its passenger car department which should be completed during September.

The Eastern Steel Co., Ltd., contracting engineers, New Glasgow, N.S., has issued bulletin one, 16 pages, 6 by 9 inches, describing and illustrating its coal handling plants.

The Ohio Brass Co. of Mansfield, Ohio, has been granted a license to manufacture brass goods, etc., at Toronto, the capital to be employed being stated as $40,000. P Atwood Hinds, Toronto, is named as the attorney for the company.

The Trolley Supply Co., Canton, Ohio, has issued a folder describing and illustrating its simplex trolley base, for which it is claimed that the construction is radically different from that of any other base, as the tension increases as the pole goes up, and decreases as the pole comes down.

Canada Machinery Corporation, Ltd.—R. M. Hamilton, who was for many years General Superintendent of the McGregor Gourlay Co.'s Works at Galt, has been appointed Works Manager of the Canada Machinery Corporation, Ltd., with supervision of the manufacturing departments of its various plants. His headquarters are at Galt, Ont.

The John Bertram & Sons Co., Ltd., Dundas, Ont., and its associate company, Pratt & Whitney Co. of Canada, Ltd., discontinued on July 31 the arrangements with the Canadian Fairbanks-Morse Co., which has acted as sales agents for the past few years. The John Bertram & Sons Co. has organized a sales staff and will handle its business and that of the Pratt & Whitney Co. direct. The head office remains in Dundas, from which the Ontario section will be handled. The eastern sales office will be at 723 Drummond Building, Montreal, in charge of Alex. Bertram, General Sales Manager. The Winnipeg office will be in charge of Alfred Martin.

Canadian Fairbanks-Morse Co., Ltd.—Announcement is made that the arrangement whereby the Canadian Fairbanks-Morse Co. have been exclusive agents for Canada, for the Niles-Bement Pond Co., and selling agents for the Pratt & Whitney Co. of Canada, and the John Bertram & Sons Co. were discontinued August 1. The C. F. M. Co. will continue to handle the products of the R. McDougall Co., Ltd., Galt, Ont., including lathes, drill presses and shapers, radial drills and planers. They will also continue to handle exclusively for Canada the Brown and Sharpe milling machines, grinders, and screw machines and the Norton grinders. They have also arranged to handle railway machinery made by Wm. Sellers and Co., Philadelphia, Cleveland twist drills and reamers, and Wells Bros. of Canada, Ltd., taps and dies.

The Detroit Lubricator Co. will exhibit the new Detroit flange lubricator at the Traveling Engineers Convention at Chicago, Ill., in September. The exhibit will consist of two wooden models of 45 degree sections of locomotive drivers with the lubricator installed in the same manner as in actual service. The whole apparatus will be rocked back and forth by an electrical contrivance to approximate working conditions on the road. The lubricator will feed on the flanges every time the lateral motion becomes pronounced and easy observation of its construction and operation will be made possible by removing sections to display the internal mechanism. In addition to this a no. 22 bullseye locomotive lubricator, air cylinder lubricator and transfer filler will be shown in operation. A complete line of locomotive lubricators, with from one to eight feeds, automatic steam chest plugs, air cylinder lubricators, transfer fillers, with sectional models and cross sections of parts will also be displayed.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto, 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, Counsel, F. King, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

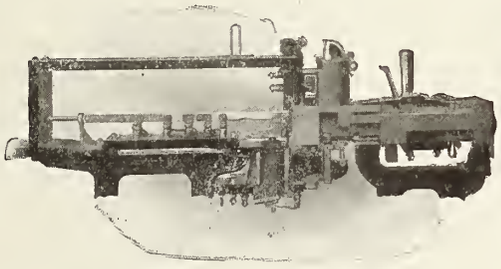
Quebec Transportation Club, A. F. Dion, Quebec.

Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.

Toronto Transportation Club, W. A. Gray, 143 Yonge St., Toronto.

Western Canada Railway Club, Louis Kon, P. O. Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July and August.

Marine Wreck Statistics.—According to Lloyds Register of Shipping, the total reduction in the effective mercantile marine of the world, during 1913, was 665 vessels, of 717,030 tons, excluding all vessels of less than 100 tons. Of this total, 371 vessels of 533,002 tons were steamers, and 294 of 184,028 tons were sailing vessels. The figures representing steamers are lower than those for 1912, by 39,743 tons, while as regards the sailing vessels they are higher by 7,808 tons. The amount of tonnage dealt with by breaking up, dismantling, etc., not in consequence of casualty, was 108,795 tons, or 48,846 tons less than in 1912. Of the total tonnage of such cases, 42¾% was represented by tonnage of the United Kingdom.



NOW it is the HALL ELECTRIC INTERLOCKING

Because that apparatus offers safety features that are found in no other. Alternating current control of return indications is safer than using the same kind of current for operating functions. Double protection is secured by using a higher voltage for the return than is used for the operating.

It is of unit construction. Levers may be removed or added without interference with the others.

HALL SWITCH AND SIGNAL CO.

50 Church St., New York

Montreal Works: Garwood, N. J. Chicago

STAND FIRM!

A grave responsibility rests on the big men of every community. They are the leaders of public opinion. And public opinion makes or breaks a business, a city or a country.

Just now with the air filled with rumors, the nervous grow more nervous—and the responsibility of leadership grows heavier on those who are capable of bearing it.

STAND FIRM!

Canada's soundness needs no argument with you. Canada's ability to weather this storm is not a matter of guesses or hopes—but one of facts and figures.

No one can exaggerate the awfulness of the present war, but the harm that admittedly can come through undue pessimism can be fended off only by men who with reason and faith, and good seamanship hold the tiller of common sense and courage firm against the present storm.

STAND FIRM!

Northern Electric Company
LIMITED

MONTREAL
HALIFAX
TORONTO

WINNIPEG
REGINA
CALGARY

EDMONTON
VANCOUVER
VICTORIA

Transportation Conventions in 1914.

Sept. 1-4.—American Boiler Manufacturers' Association, New York.
Sept. 8-10.—Roadmasters and Maintenance of Way Association, Chicago, Ill.
Sept. 8-11.—Master Car and Locomotive Painters' Association of the United States and Canada, Nashville, Tenn.
Sept. 15, 16.—American Association of General Passenger and Ticket Agents, Boston, Mass.
Sept. 22-24.—Railway Signal Association, Bluff Point, N.Y.
Oct. —.—American Association of Dining Car Superintendents, Washington, D.C.
Oct. 12-16.—American Electric Railway Association, Atlantic City, N.J.
Oct. 14-16.—American Association of Railway Surgeons, Chicago, Ill.
Oct. 19-23.—Association of Railway Electrical Engineers, Chicago, Ill.
Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.
Nov. 17.—National Association of Railway Commissioners, Washington, D.C.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.
Nov. 18.—American Railway Association, Chicago, Ill.

Ontario Jockey Club
Toronto

Autumn Meeting
September 19th to 26th

Racing
Steeplechasing

General Admission, $1.50

JOS. E. SEAGRAM, President. W. P. FRASER, Sec'y-Treas.

CANADIAN PACIFIC RAILWAY COMPANY

Dividend Notice.

At a meeting of the Board of Directors held to-day, the following dividends were declared:—

On the Preference Stock, two per cent. for the half year ended 30th June last.

On the Common Stock, two and one half per cent. for the quarter ended 30th June last, being at the rate of seven per cent. per annum from revenue, and three per cent. per annum from Special Income Account.

Both dividends will be paid on 1st October next to shareholders of record at the closing of the books in Montreal, New York and London, at 3 p.m. on Friday, 21st August next.

All books will be re-opened on Thursday, 15th October next.

By order of the Board.

W. R. BAKER.
Secretary.

Montreal, 10th August, 1914.

Coal and ash handling conveyors, belt conveyors, structural steel, heavy machine and foundry work, coal mine bankheads and screening plants, mine fans, etc.

Engineers and Contractors
THE EASTERN STEEL CO., LTD.
Formerly the Brown Machine Co., Ltd. and Bailey-Underwood Co., Ltd.
New Glasgow : : : : : : : : Nova Scotia

CANADIAN PACIFIC RAILWAY COMPANY

NOTICE TO SHAREHOLDERS.

The Thirty-third Annual General Meeting of the Shareholders of this Company, for the election of Directors to take the places of the retiring Directors and for the transaction of business generally, will be held on Wednesday, the seventh day of October next, at the principal office of the Company, at Montreal, at Twelve o'clock noon.

Special Meeting.

The meeting will be made special for the purpose of considering and, if approved, of authorizing an increase of the present authorized Ordinary Capital Stock of the Company by the amount of $75,000,000, that is, from $260,000,000 to $335,000,000, in order to make it accord with the amount for which the Company has the sanction of Government, no portion of such additional stock to be issued, however, until the authority of the shareholders has been obtained at a Special General Meeting called for the purpose.

The common Stock Transfer Books will be closed in Montreal, New York and London at 3 p.m. on Friday, the twenty-first day of August. The Preference Stock Books will be closed in London at the same time.

All books will be re-opened on Thursday, the fifteenth day of October.

Montreal, August 10th, 1914. By order of the Board, W. R. BAKER, Secretary.

Your Requirements

of bare copper wires and cables of all kinds and sizes for trolley and line wire, transmission strands, etc., can be supplied by us on short notice.

STANDARD Bare Copper Wire

is rolled and carefully drawn to gauge in our own rod and wire mills from the highest grade copper wire bars.

Our nearest office will quote prices promptly.

Standard Underground Cable Co., of Canada, Limited
Hamilton, Ont.

Montreal, Que. Winnipeg, Man. Seattle, Wash.

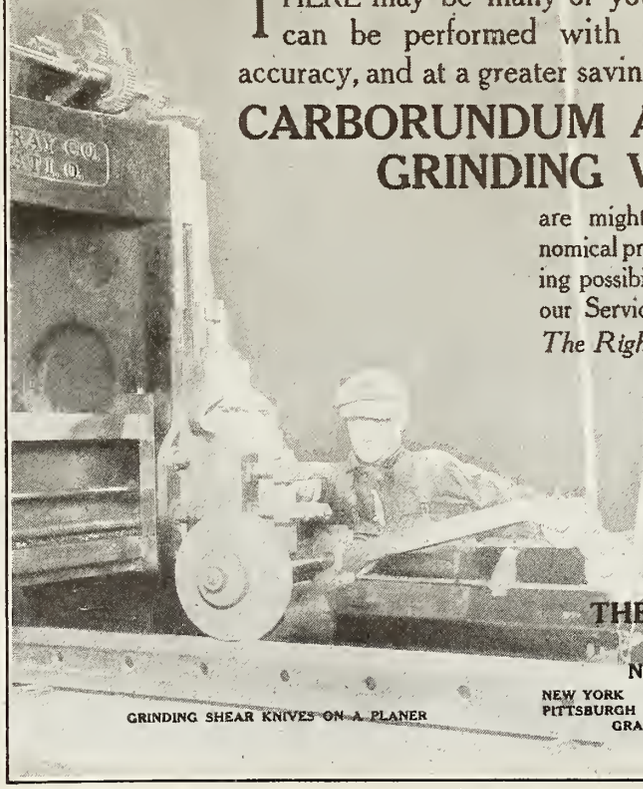
Manufacturers of Electric Wires and Cables of all kinds, all sizes, for all services, also Cable Accessories.

ARE YOU GRINDING ALL YOU CAN?

THERE may be many of your shop operations that can be performed with greater speed, greater accuracy, and at a greater saving with a grinding wheel.

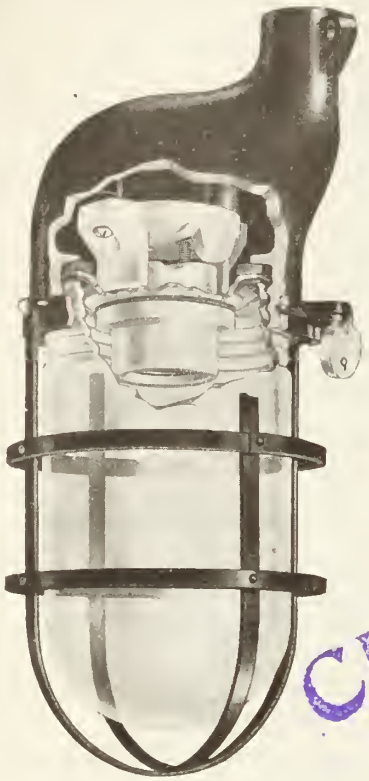
CARBORUNDUM AND ALOXITE GRINDING WHEELS

are mighty important factors in economical production. Look into your grinding possibilities. Tell us about them and our Service Department will give you *The Right Wheel in the Right Place.*



GRINDING SHEAR KNIVES ON A PLANER

THE CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.
NEW YORK CHICAGO BOSTON PHILADELPHIA
PITTSBURGH CLEVELAND CINCINNATI MILWAUKEE
GRAND RAPIDS MANCHESTER, ENG.



Broken-away View Showing Interior

Condulets of V & VH Series

Vapor, Gas and Dust Proof

For marine work and in breweries, refineries, flour mills or wherever there is dampness, gas or fine dust.

These Condulets remain vapor, gas and dust proof even though globes be broken or removed for lamp renewals.

Illustrations below show a few of the many forms in which these series of Condulets are made.

Type V D | Type V F | Type VJ | Type V K | Type V P

Order from your jobber. If he does not stock them, write us. All Condulets fully illustrated, described and listed in Catalog 1000. Copies Free!

Crouse-Hinds Company of Canada, Ltd.

Main Office and Works:

Toronto, Ontario, Canada

The Keynote Of Its Success Is Dynamic Indication

THE features of vital importance in considering the merits of any system of power interlocking are those which are designed to give the greatest measure of ***safety*** together with facility of operation.

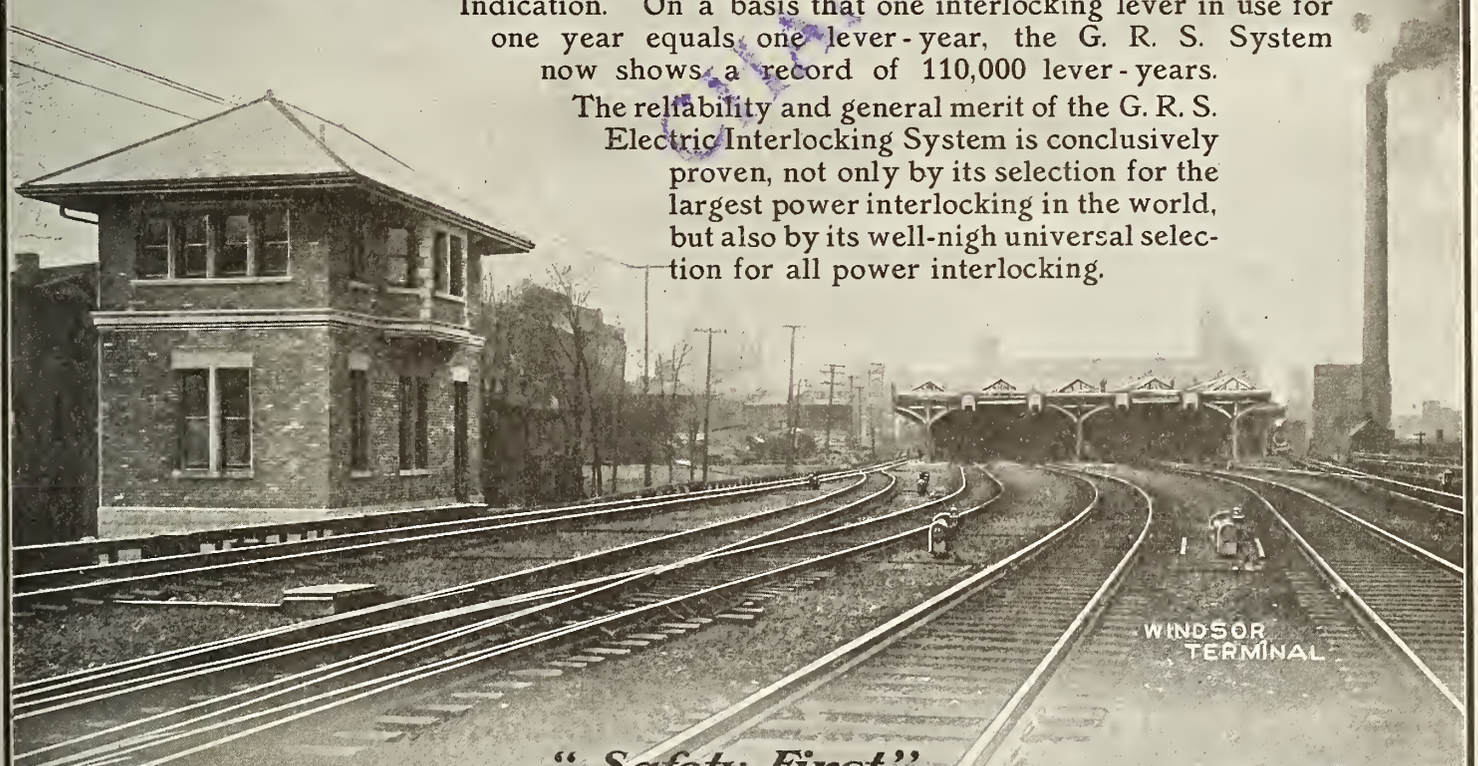
FIRST—The means provided to check the correspondence of movement between lever and the switch, signal or other functions controlled by it.

SECOND—The means for preventing unauthorized movement of switches, signals, or other controlled functions.

The G. R. S. Electric Interlocking System fully meets the first important requirement by means of ***dynamic indication.*** The second requirement is met by a means in which all the contacts required for this protection form a part of the operating circuit, thus checking their integrity at each operation.

Eighty per cent of all power interlocking now installed is G. R. S. Electric Dynamic Indication. On a basis that one interlocking lever in use for one year equals one lever-year, the G. R. S. System now shows a record of 110,000 lever-years.

The reliability and general merit of the G. R. S. Electric Interlocking System is conclusively proven, not only by its selection for the largest power interlocking in the world, but also by its well-nigh universal selection for all power interlocking.



"Safety First"

GENERAL RAILWAY SIGNAL COMPANY

OF CANADA LIMITED

Office and Works, Lachine, Quebec

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TRAIN SHED, C.P.R. WINDSOR ST. STATION, MONTREAL.
Contractor L. H. Neilson Company, Pittsburg, Pa.

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A lighting installation for train sheds or car barns must completely illuminate the walks, the steps of the cars, the tracks, the taps for steam heating and the electrical outlets for storage battery lighting of the cars.

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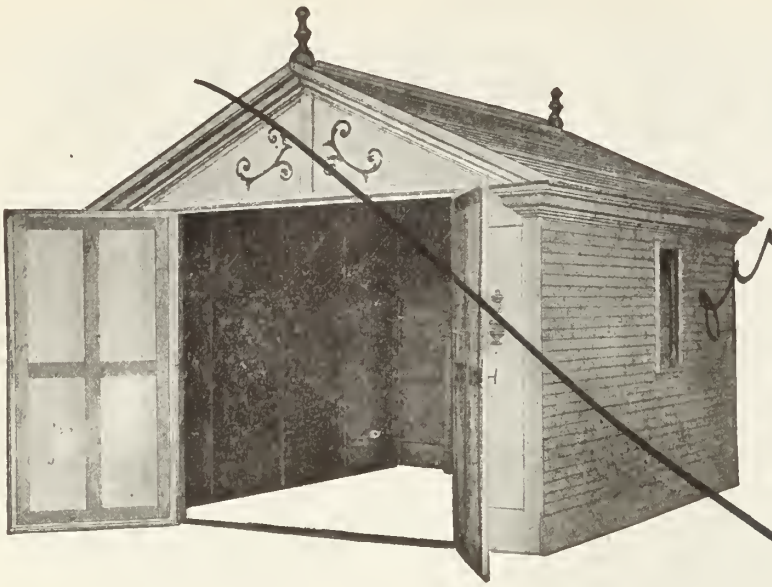

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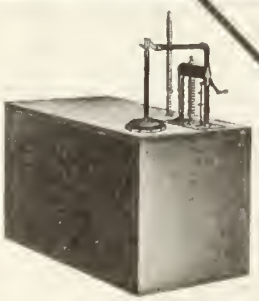

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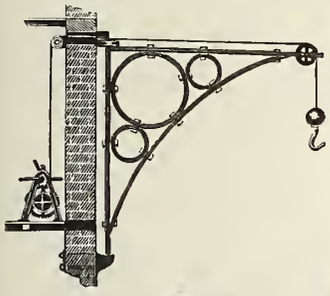

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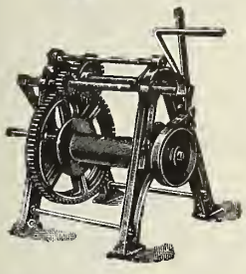

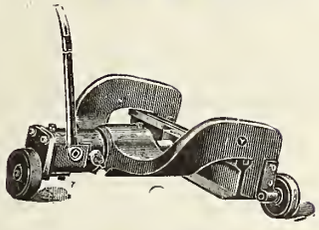

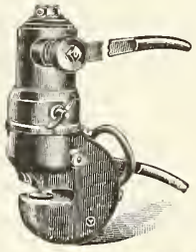

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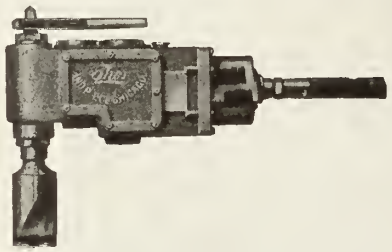

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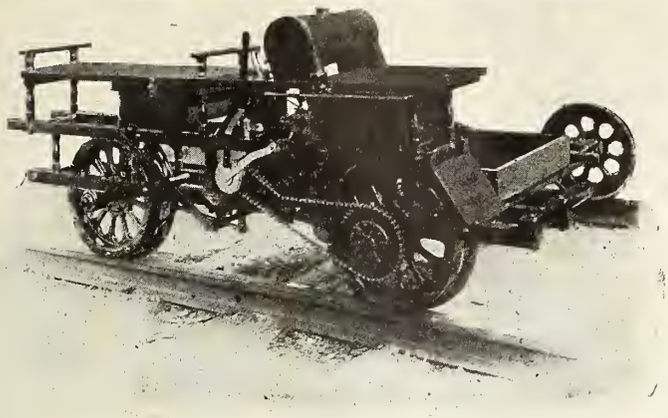

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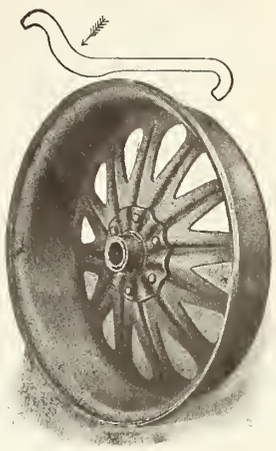

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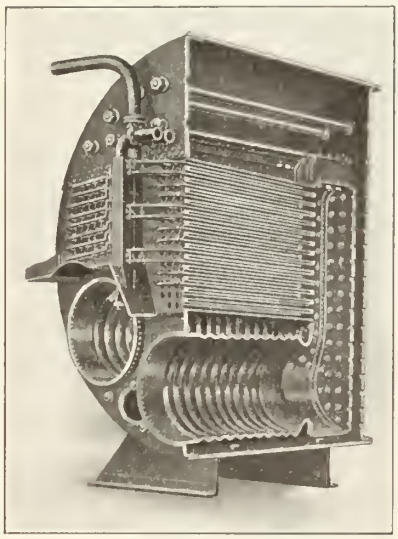

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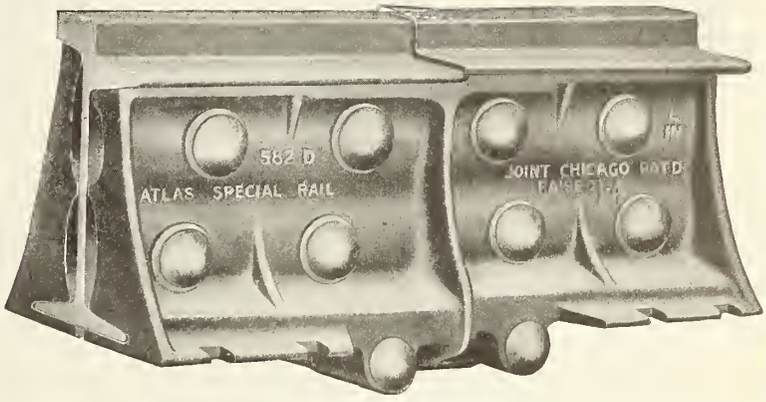

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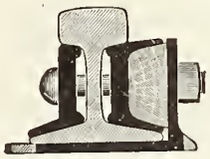

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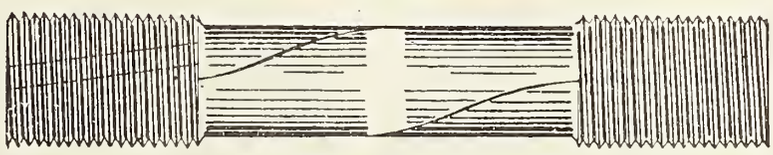

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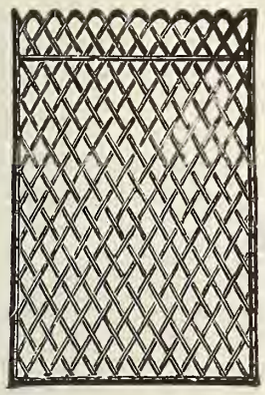

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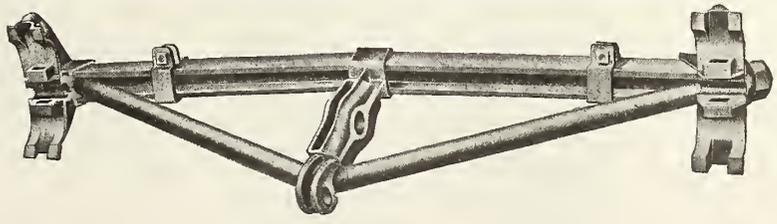

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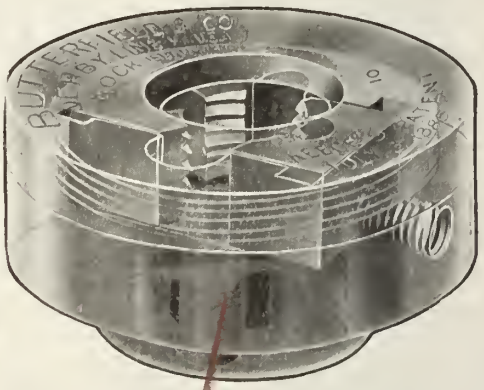

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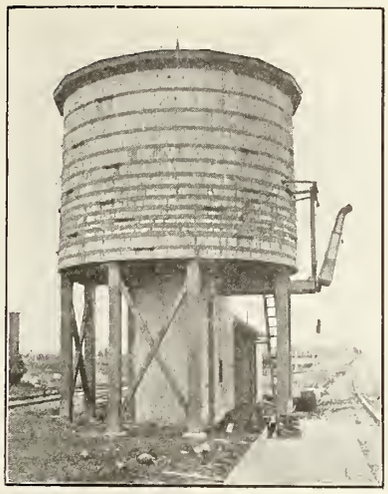

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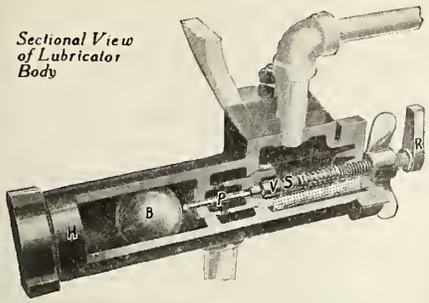

Sectional View of Lubricator Body

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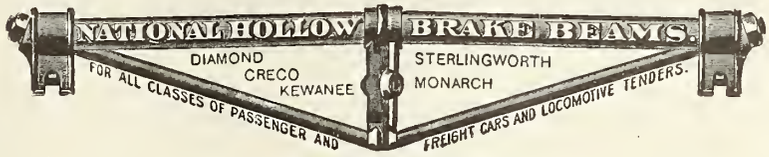

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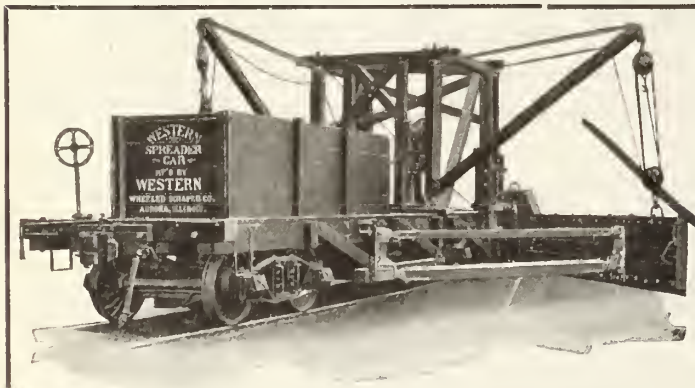

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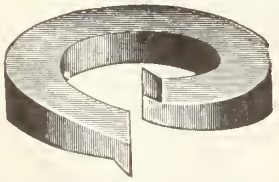
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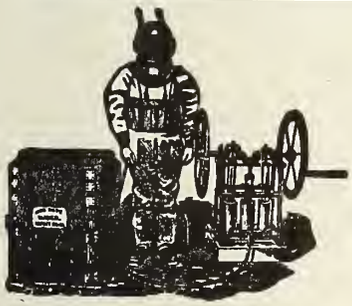

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RAILWAY AND SHIP BUILDING PLANTS
Wheel Presses, Keel Plate Bending Presses, Riveters,
Shears, Presses, etc., etc.
Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power
Plants, Cast Iron Pipe, Hydrants, Valves & Fittings, etc., etc.
R. D. WOOD & CO.
PHILADELPHIA, Pa.

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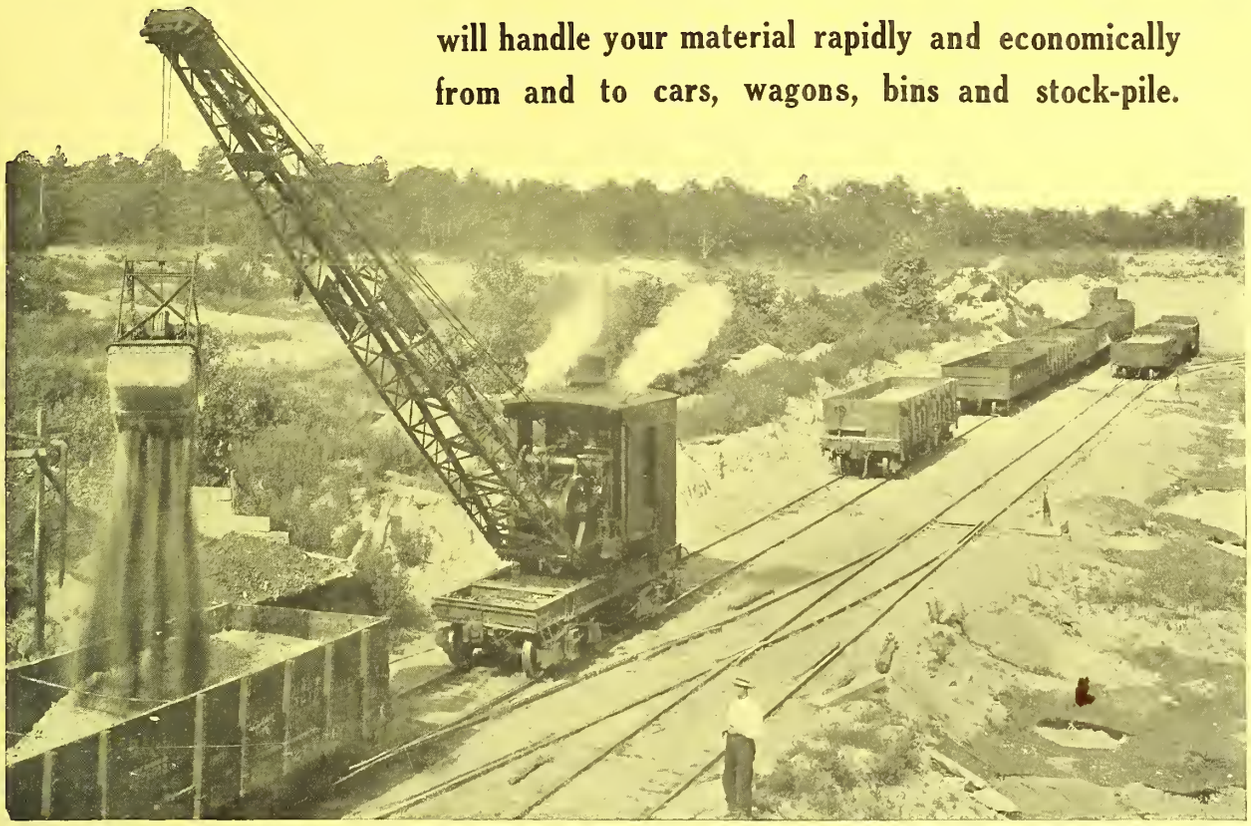
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

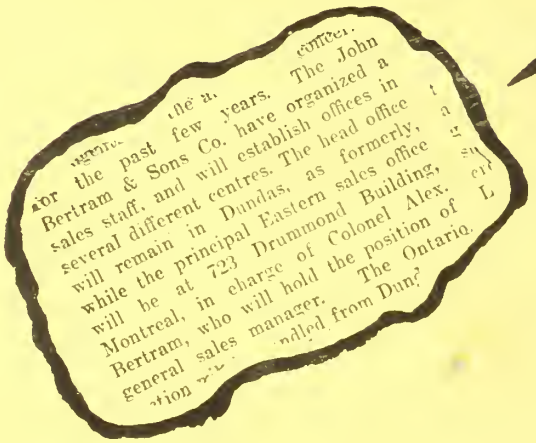
Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

CLEVELAND, OHIO, U.S.A.

Canadian Office, 145 St. James St., Montreal

What This Means to you!



It Means:

The right to bring your Machine Tool problems to **Machine Tool Experts.**

Sixty years of successful machine tool experience is behind our sales organization.

Expert advice by salesmen who specialize on tools alone.

Our Sales Staff sell nothing but Machine and Small Tools, and are experts at their business.

Prompt attention to your requirements.

An experienced and competent staff to handle your enquiries intelligently.

A Community of Interests.

Our success depends on your satisfaction. Our interests and yours are therefore identical.

It Means Just This:

SERVICE AND A SQUARE DEAL

CHANGE

BERTRAM
MACHINE TOOLS

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

723 Drummond Building,
MONTREAL, QUE.

and

Bank of Hamilton Building,
WINNIPEG, MAN.

VANCOUVER, B.C.

Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 200 — TORONTO, CANADA, OCTOBER, 1914 — Subscription Rates Page 467

Eventually—Reasons Why

Long experience, with good supply of Timber, three Sawmills and large, well equipped Planing Mills, combined with a healthy desire to supply the requirements of Railway Companies and large Contractors, have given us a good share of this trade and we appreciate it. Our old customers are sticking to us and it is our duty to continue supplying their requirements satisfactorily.

Catering to this trade means that you will find in our yards many items not usually carried by other firms.

Large quantity of Track Ties and Fence Posts in stock.

John Harrison & Sons Co., Limited

OWEN SOUND - - ONTARIO

In addition to all regular and special sizes in Pine, Hemlock, Cedar, Maple, Birch, Oak, Elm and Basswood, we manufacture the finest of Interior Trim, Sash and Doors, Frames, Flooring, etc.

OUR 3/8" SIDE AND END MATCHED CANADIAN BIRCH FLOORING is warranted to please and can be laid over rough floor in new buildings or over old floors that are worn so that it is almost impossible to keep dirt from accumulating. Try some of this in your own residence. We ship direct; specify size of rooms.

MAPLE DRAFT TIMBERS, Winter-sawn, are firmer, brighter and stand more pounding than any other native wood. We supply large or small orders promptly and carry a few carloads in stock.

OUR STANDARD TIE PLUGS, made by special machines, are being used from Atlantic to Pacific by all railways in Canada, but one, and as we have sufficient capacity to supply all promptly from stock, we hope to eventually supply this other line.

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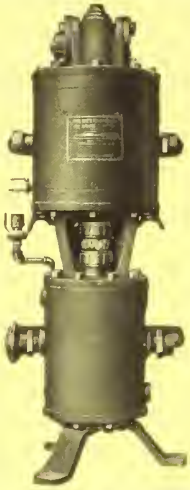


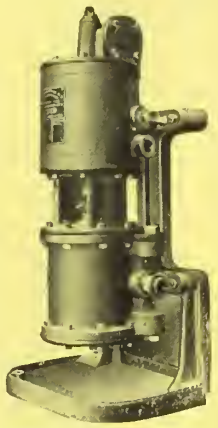
Portable Compressor for High Delivery Air Pressure.

The man who uses compressed air appreciates the simplicity of construction, the simplicity of operation, the dependability and the adaptability of

Westinghouse Air Compressors

There are a wide range of standard sizes and styles in the steam driven type to select from and any special conditions may be provided for by modifying the proportions of air and steam cylinders, as the conditions may require.

Cross Compound Compressor on Boiler.



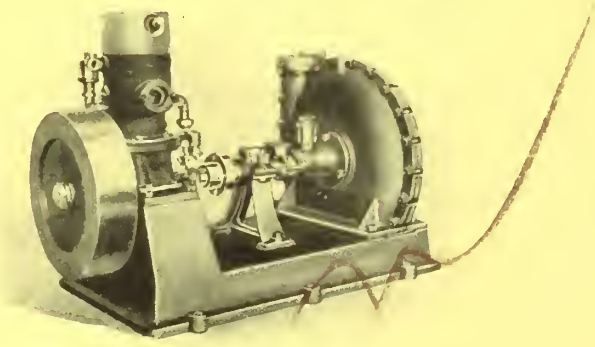
Compressor on Stand.

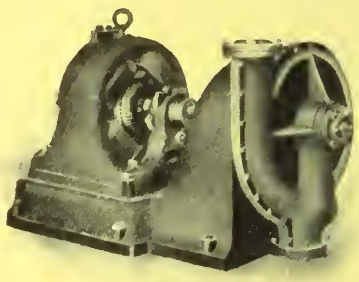
Canadian Westinghouse Co., Limited, Hamilton, Ont.

TORONTO, Traders Bank Bldg. MONTREAL, 52 Victoria Square. OTTAWA, Ahearn & Soper, Ltd.
HALIFAX, Telephone Bldg. FORT WILLIAM, Telfer Bldg. WINNIPEG, 158 Portage Ave. E.
CALGARY, Grain Exchange Bldg. EDMONTON, Dominion Bldg. VANCOUVER, Bank of Ottawa Bldg.

Centrifugal PUMPS

All Sizes—Equipped With All Styles of Power





We furnish Centrifugal Pumps of all types. We will be pleased to receive your enquiry for Direct Connected Centrifugal Pumps to Steam or Gasoline Engines or Electric Motors. Also Pumps arranged for Belt Drive.

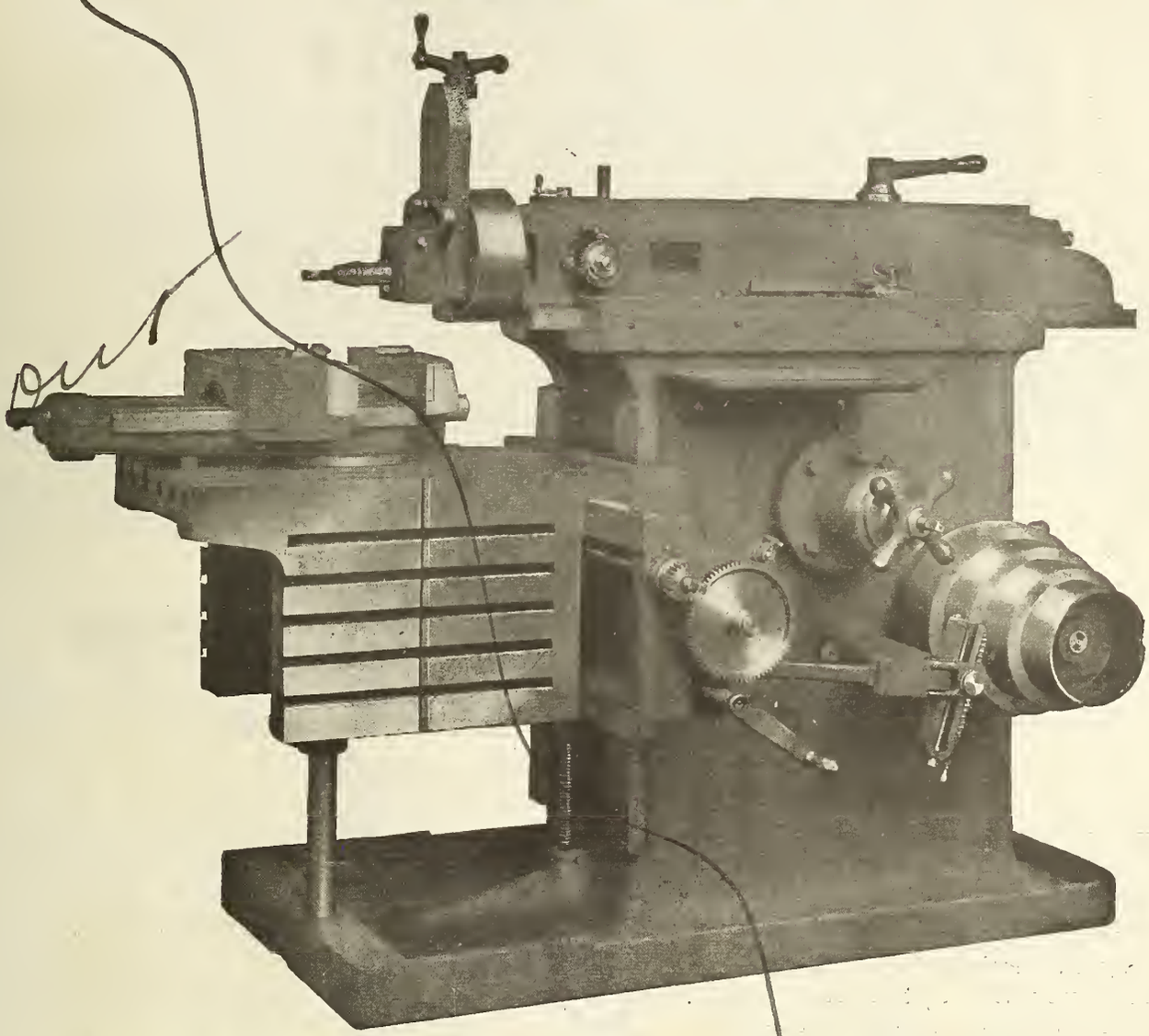
Our Pumps are exceedingly well built—Large bearings and shafts. All parts are accurately fitted. Full particulars—illustrations, etc., furnished upon request.

BRANCHES
ST. CATHARINES, ONT.
WINNIPEG, MAN.
VANCOUVER, B.C.

F·H·Hopkins & Co

HEAD OFFICE
MONTREAL

SHAPERS C.M.C. SHAPERS



24 x 30 Back Geared Crank Shaper with Automatic Down and Cross Feeds.

Our shapers do **accurate** work at **high** speeds and with **heavy** feeds. The substantial and rigid design together with careful construction make this possible, convenient adjustment handles with graduated collars enable the operator to produce more and better work.

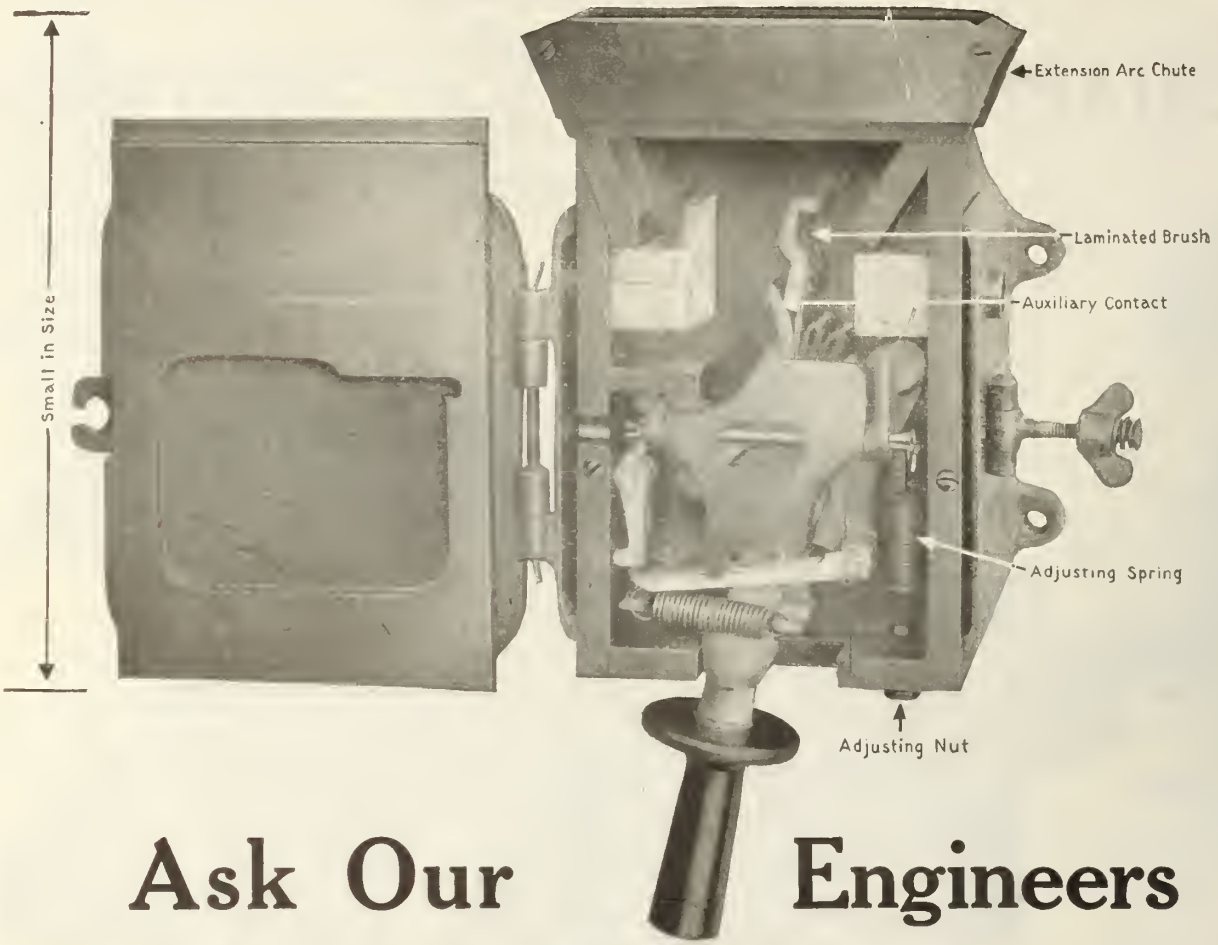
Our careful selection and inspection of materials ensures long life for the machine. Built in two sizes 16"x20" and 24"x30". Details of design and construction given in our Bulletins sent on request.

Representatives:—

QUEBEC: Williams & Wilson, Limited, Montreal. MANITOBA: The A. R. Williams Machinery Co., Ltd., Winnipeg

Canada Machinery Corporation, Ltd., Galt, Ontario

BUILDERS OF LOCOMOTIVE, CAR AND MACHINE SHOP EQUIPMENT.



Ask Our Engineers

About the Type MR Circuit Breaker

FOR STREET RAILWAY SERVICE

Q—How large is the Type MR Form D breaker?

A—Approximately 8 x 12 x 6½ inches over all, handle excepted. The device is compact and inconspicuous.

Q—What is the virtue of the extension arc chute?

A—It conceals the flash attendant upon breaking the circuit, so passengers are not startled.

Q—Why is the main contact laminated?

A—To secure perfect contact with a wiping motion preventing dust or grit from binding the contact surfaces.

Q—Why is there an auxiliary contact?

A—To hold the circuit until the main contact has moved away. This protects the main contact from burning or injury. The auxiliary contact is easily renewable.

Q—What is the function of the adjusting nut and spring?

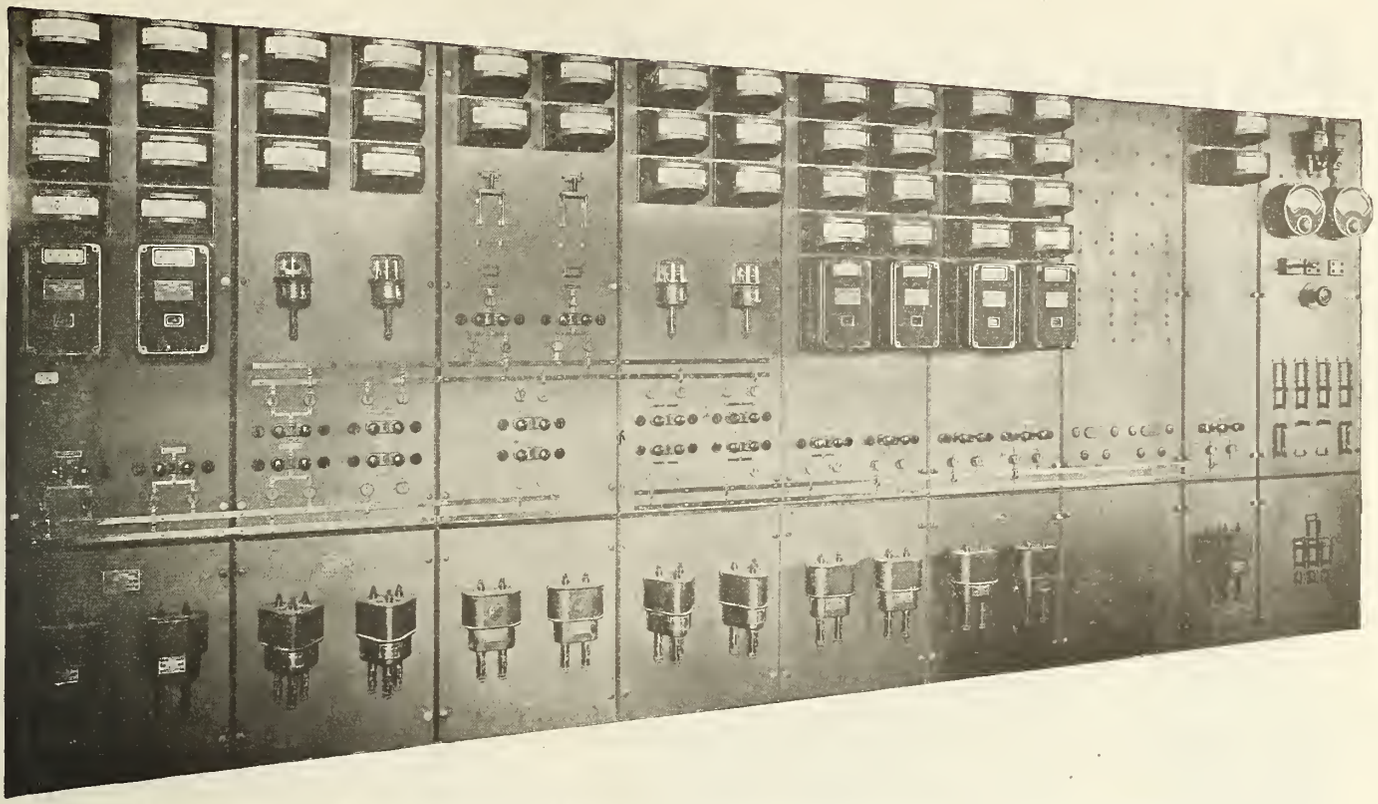
A—Turning the nut adjusts the spring to trip the breaker automatically at any point between the calibration limits plainly indicated on the device.

CHANGE

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



2,200/ 22,000/60,000 Volt Switchboard, with Electrically Operated Oil Switches for Winnipeg Electric Railway.

Do You Need a Switchboard?

If so, you want one that looks well, one that you can get at a reasonable price, but above all **ONE THAT IS THOROUGHLY RELIABLE.** This is the only kind we build, and we are all ready to build yours. Consult our Switchboard Specialists if you want any information or advice on the most modern apparatus and details of equipment, or on the general arrangement of your switchboard.

No plant is too small or too big, nor is its voltage too low or too high for our switchboards to control.

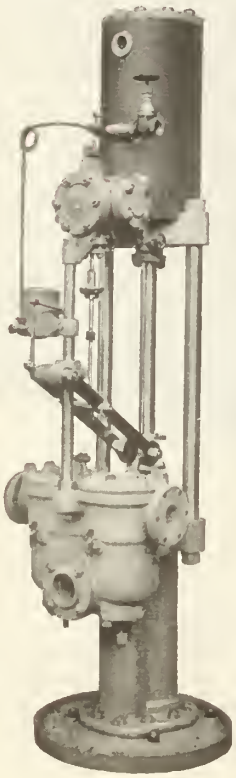
CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Pumping Machinery

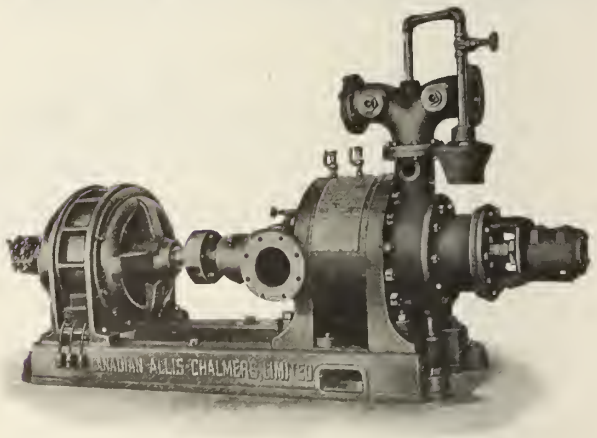
Designed and Built to Suit Conditions of Operation



Centrifugal Pumps
Duplex Pumps
Geared Pumps
"High Duty" Pumping Engines
Reciprocating Pumps
Hydraulic Transmission Pumps
Underwriters' Fire Pumps
Turbine Pumps

The vertical direct acting steam pump for boiler feed purposes here shown is suitable for 200 lbs. pressure. Note roller bearing on motion levers; patent group valves; gunmetal lined water cylinders; water pistons fitted with ebonite rings; sizes 810 to 10,000 gals. per min.

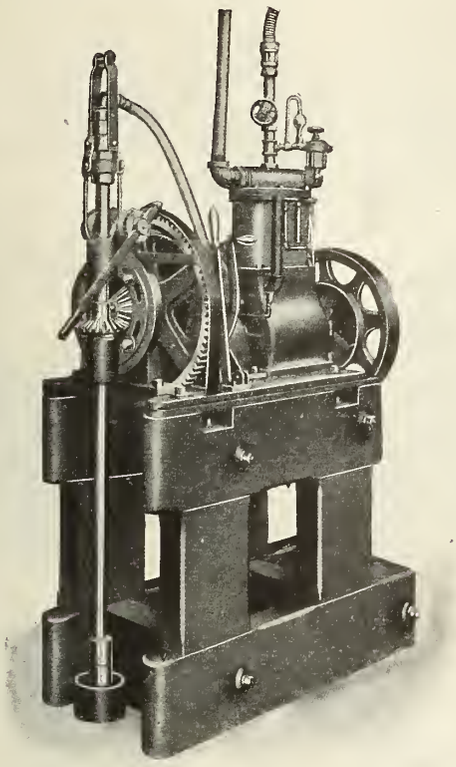
Mather and Platt Turbine Pumps built by us are in use for a great variety of purposes, including waterworks, boiler feed, condensing, and circulating service, locomotive supply, bilge and dock pumping, fire and sewage. The Underwriters' Fire Pump here shown has a capacity of 500 gals. per min. against a head of 241 feet. These pumps are built in capacities of 500, 750, 1000 and 1500 gals. per min.



CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



UNDERPINNING A BRIDGE

A McKiernan-Terry Core Drill was successfully used on a job of underpinning in connection with the Grand Central Station improvements, New York, under most unusual conditions.

Owing to a settlement of the columns supporting the bridge crossing the yard at Fifty-fourth street, it was decided to provide a more secure foundation by underpinning them and extending the supports to bed-rock. With the core drill four 14-inch holes were drilled close together around each column and were driven through the concrete footing. Then 10-inch steel pipe was thrust through these drill holes into the soft material and were driven down until rock was reached. These holes were cleaned out and 5-inch core holes were put down a sufficient distance into the rock to insure a sound bottom. Reinforced concrete piles were then cast in the holes, and, by proper means, the columns were made to rest thereon.

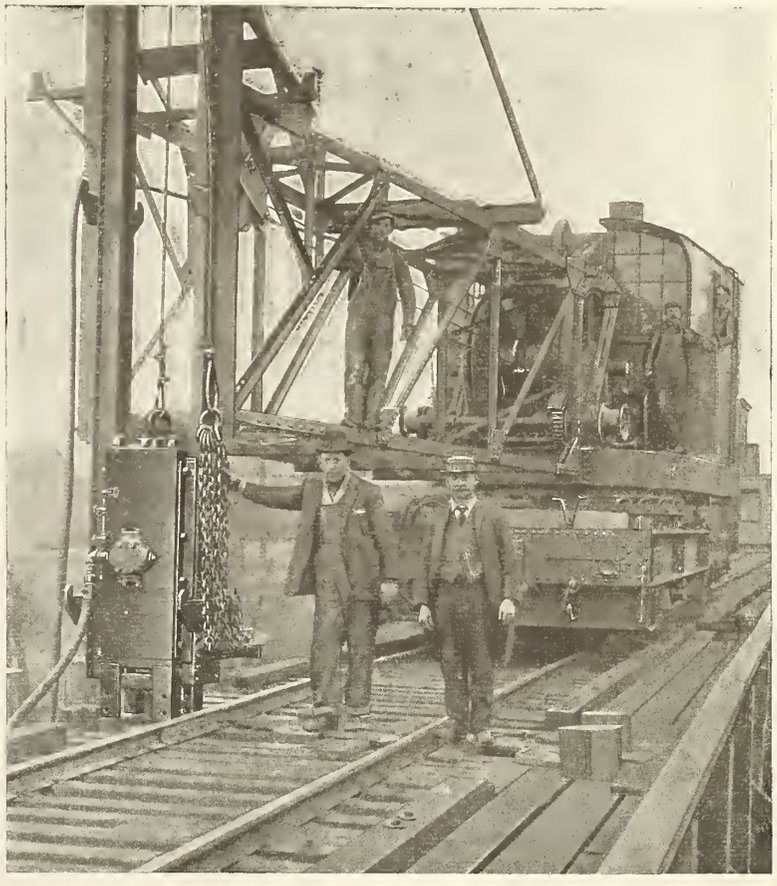
This particular method of correcting the settlement of the columns was the only one which could be carried on without interrupting either the traffic in the yards or over the street bridge.

For other application of Core Drills see Bulletin 512.

PILE HAMMERS

McKiernan-Terry Pile Hammers are well adapted for and will readily drive the largest and heaviest kinds of piling that is at present being used. Recent tests made with one of our No. 9 pile hammers in driving heavy wooden sheeting through foreign material—gravel, fill, etc.—showed that it would do more effective work than a 6,000 pound drop hammer. The tests further demonstrated that rapid and uniform piston blows were more efficient than the heavy and infrequent blows of the drop hammer, and that it was possible to attain the same penetration in the miscellaneous material without splitting or "brooming" the piling.

The illustration shows a No. 7 Pile Hammer in leads of a locomotive crane. Without any special base arrangement the hammer is used for driving both sheeting and round piles.



CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Canadian Locomotives

for contractors, industrial works, railroads, etc.

CONSOLIDATION FREIGHT LOCOMOTIVE BUILT FOR THE GRAND TRUNK PACIFIC.

Gauge 4 ft. 8½ ins. Diameter and stroke of cylinders 23 x 30 ins. Diameter of driving wheels 63 ins. Driving wheel base 17 ft. Engine wheel base 25 ft. 9 ins. Total wheel base 57 ft. 3½ ins. Weight of engine in working order 211,000 lbs. Weight on drivers 184,600 lbs. Tractive power 38,540 lbs. Tender tank capacity 6,666 Imp. gals. Tender coal capacity 10 tons. Weight of tender in working order 150,000 lbs.

We have had fifty years' experience as builders of locomotives. Our expert workmen are in many cases the sons or grandsons of men who worked in our shops many years ago. Combined with this long experience and expert workmanship, we have new equipment, efficient management and expert designers.

Special attention is paid to economy of maintenance; also to design of boiler and fire-box to ensure ample steam capacity and economy of fuel.

Duplicate parts are carried in stock for immediate shipment. We build locomotives to meet the Government regulations of the various Provinces. All sizes—all types—all practical gauges.

All materials used in the construction of Canadian locomotives are the very best. They are subjected to careful inspection and test, and any materials failing to meet the highest standards or showing defects of uniformity are rejected. Any materials developing defects in working are also rejected.

Handsome catalogue, 108 pages, 38 illustrations, with valuable tables and data, free to engineers, contractors or manufacturers—on request.

We are also builders of stationary boilers suitable for contractors or industrial plants.

Canadian Locomotive Company, Limited

Kingston - Ontario - Canada

Grey iron castings—any size or shape—ordinary or intricate—made promptly.
New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract.

HIGH GRADE ELECTRIC

STEEL CASTINGS

MANGANESE STEEL

FOR CRUSHER JAWS AND HEAVY WEAR PARTS

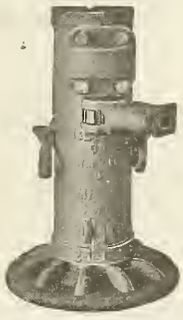
BRONZE

M.C.B. STANDARD JOURNAL BEARINGS & ENGINE BEARINGS

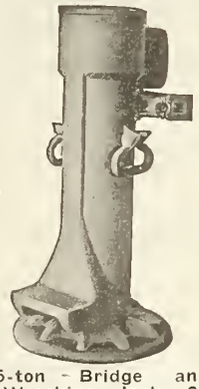
CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.

Showing the construction of our geared jacks.



25 - ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.



35-ton - Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

IMPROVED REINFORCED STEEL BACKED

BRAKESHOES

LOCOMOTIVE DRIVER and TRUCK SHOES. FREIGHT and PASSENGER CAR and ELECTRIC CAR SHOES.

Canadian Brakeshoe Company, Limited

Sherbrooke, Que.

Sole Agents for Brakeshoes for Canada outside of British Columbia, Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for British Columbia, The B.C. Equipment Co., Vancouver, B.C.

1600 Bonds Stolen!

We heard of one traction company having this number of bonds stolen from their rails. No one blames THEM for being greatly incensed at it, to say the least.

The Surprising Thing

is the fact that there are dozens of roads from which an equal or greater number of bonds have been worse than stolen by the corrosive effect of moisture, and THEY are not saying anything about it.

Perhaps they don't know it. Electric Weld Rail Bonds do not corrode at the terminals.

The Electric Railway Improvement Co.

2070 East 61st Street,

Cleveland, Ohio

Hunting in New Brunswick

Written by a
SPORTSMAN
for
SPORTSMEN
—telling how he

Filled His License

1 Moose
1 Caribou
2 Deer
and a
Bear

During a Three Weeks Hunting Trip in—— New Brunswick

Open Season SEPTEMBER 15th—NOVEMBER 30th.

Write for free copy to

H. H. MELANSON, General Passenger Agent,
Canadian Government Railways,
Moncton, New Brunswick.

EDISON BSCO

PRIMARY BATTERY

FOR TRACK CIRCUITS

The Standard Closed Circuit Cell

RSA Cell, 400 Ampere Hours Capacity.

While the problem of keeping maintenance costs at the lowest figure consistent with good service has always been given a great deal of attention by the railroads generally, the matter unquestionably occupies a more prominent position now than ever before. Therefore, the following letter, written by an efficiency investigator to the officer in charge of signaling, is of particular interest:

"On the line of economy we have been for the past year experimenting on saving current on D. C. track circuits by using Edison-Bsco caustic batteries, with a resistance, in place of gravity batteries, and I wish to report the following results on three experimental circuits:—

	Installed.	Taken Out.	Service.
First Test	2-24-13	1-17-14	11 mos.
Second Test	3-15-13	1-18-14	10 mos.
Third Test	4-9-13	11-21-13	7 mos.

Average time, 9 1-3 mos.

"For the purpose of comparison, a gravity track circuit costs:

	9 months	One Year.
Gravity	$6.91	$9.21
Edison	2.55	3.40
Saving per year per circuit, $5.81.		$5.81

"I am going deeper into this and am replacing about 150 circuits with Edison-Bsco batteries, which will make quite a saving for account No. —

"The above figures are based on the old elements of the Edison-Bsco batteries being sold to the manufacturers of the battery who pay $.16 each renewal, which is a much better price than procured by us when sold as scrap.

"Kindly advise your wishes in the matter."

And remember that in addition to the economical feature, improved operation results on account of the greater reliability of the Edison Cell.

Correspondence solicited. Catalog on request.

RSA Barrel Shaped Cell, 400 Ampere Hours Capacity.

The Cheapest Form of Battery Energy

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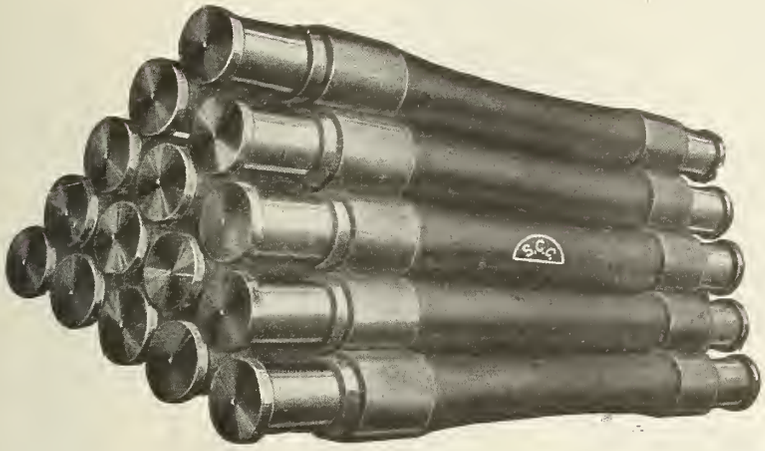

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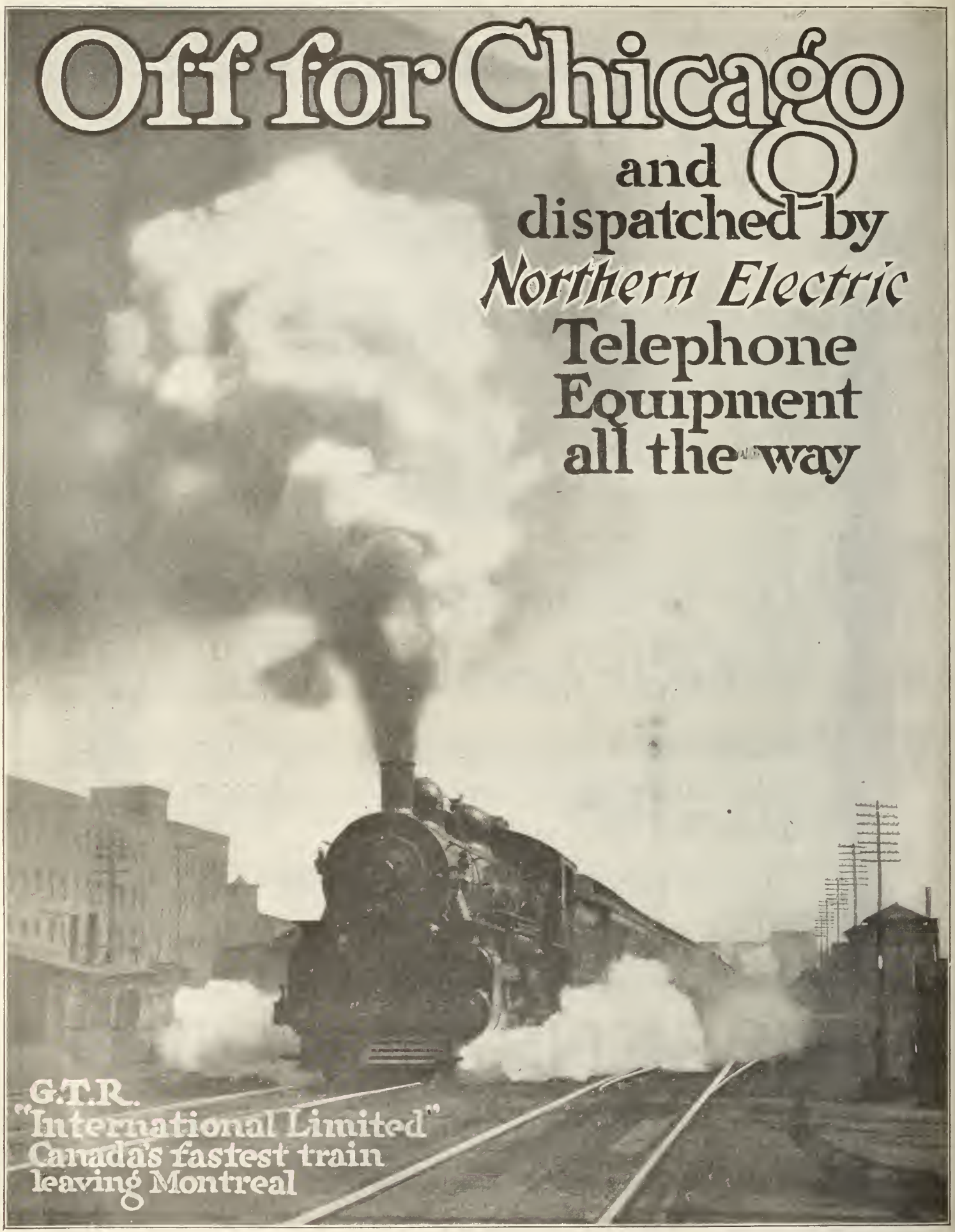

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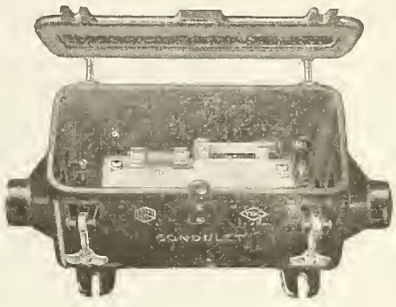

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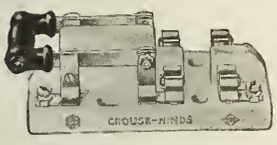

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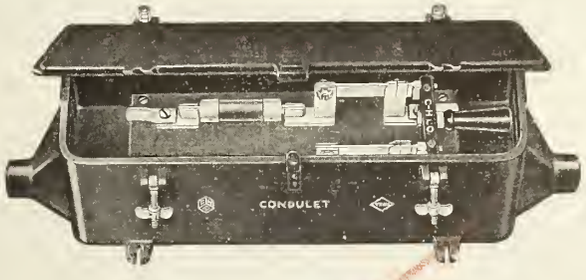

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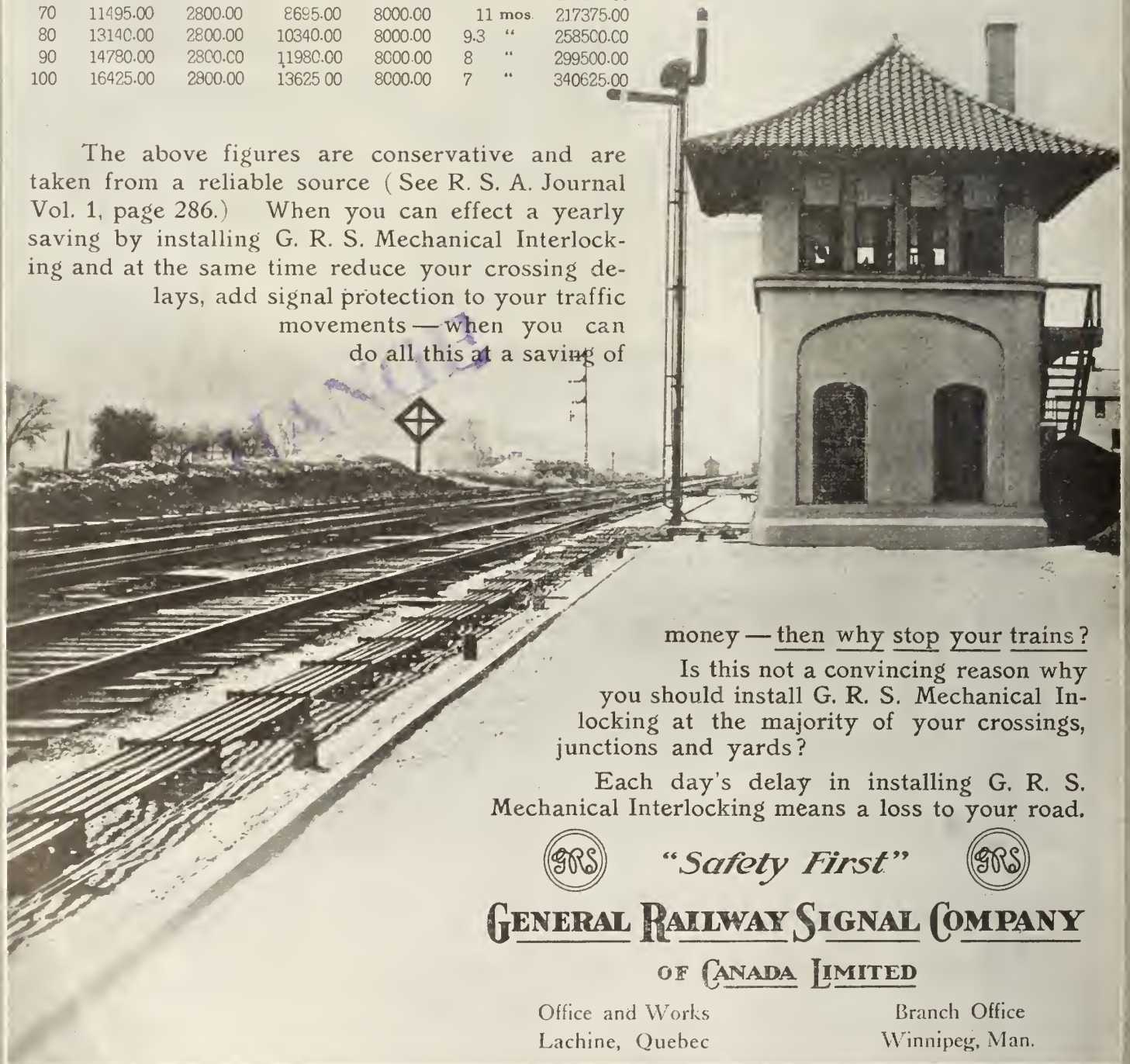
Why Stop Your Trains?

Consider the Cost of Stopping Trains in comparison to the Maintenance and Operation of Mechanical Interlocking.

Trains per day	Cost per year acct. stopping trains	Total cost per year interest deterioration maintenance and operation	Net saving per year	Cost of Interlocking Plant Complete	Time required to pay for installation from saving	Saving capitalized at four per cent
17	$ 2800.00	$2800.00		$8000.00		
20	3285.00	2800.00	$ 485.00	8000.00	16.5 years	$12125.00
25	4105.00	2800.00	1305.00	8000.00	6.13 "	32625.00
30	4930.00	2800.00	2130.00	8000.00	3.8 "	53250.00
40	6570.00	2800.00	3770.00	8000.00	2.12 "	94250.00
50	8210.00	2800.00	5410.00	8000.00	1.48 "	135250.00
60	9855.00	2800.00	7055.00	8000.00	1.13 "	176375.00
70	11495.00	2800.00	8695.00	8000.00	11 mos.	217375.00
80	13140.00	2800.00	10340.00	8000.00	9.3 "	258500.00
90	14780.00	2800.00	11980.00	8000.00	8 "	299500.00
100	16425.00	2800.00	13625.00	8000.00	7 "	340625.00

The above figures are conservative and are taken from a reliable source (See R. S. A. Journal Vol. 1, page 286.) When you can effect a yearly saving by installing G. R. S. Mechanical Interlocking and at the same time reduce your crossing delays, add signal protection to your traffic movements — when you can do all this at a saving of



money — then why stop your trains?

Is this not a convincing reason why you should install G. R. S. Mechanical Interlocking at the majority of your crossings, junctions and yards?

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GRS *"Safety First"* GRS

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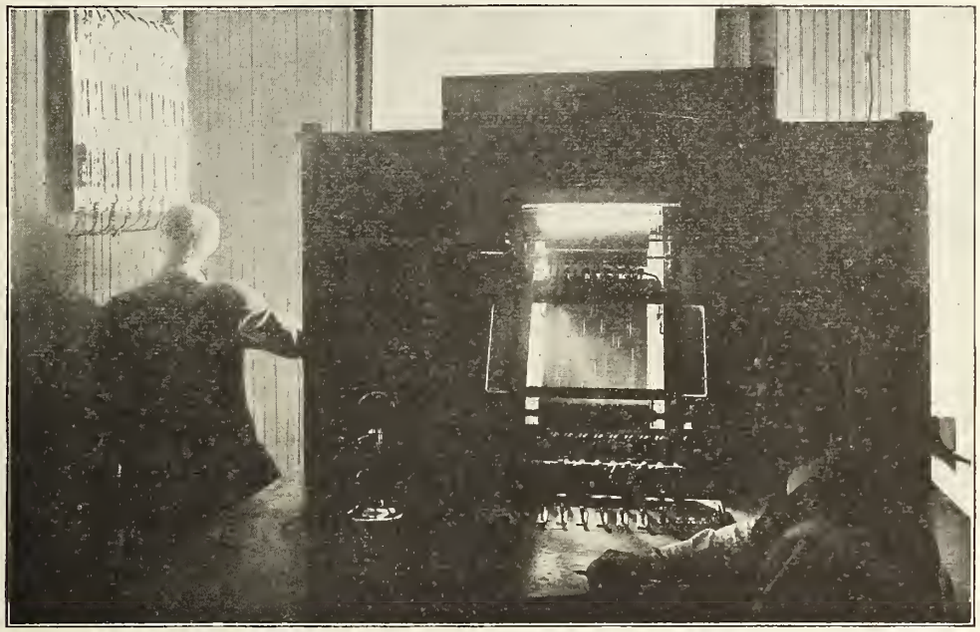
What Do You Really *Know* About The Simmen System of Signaling



Did you ever talk about it to any responsible official of any of the high-speed interurban roads using the Simmen System?

Did you ever ride on a car protected by this System? And see the cab signal constantly staring the motorman in the face—see it change from green to red and back to green again?

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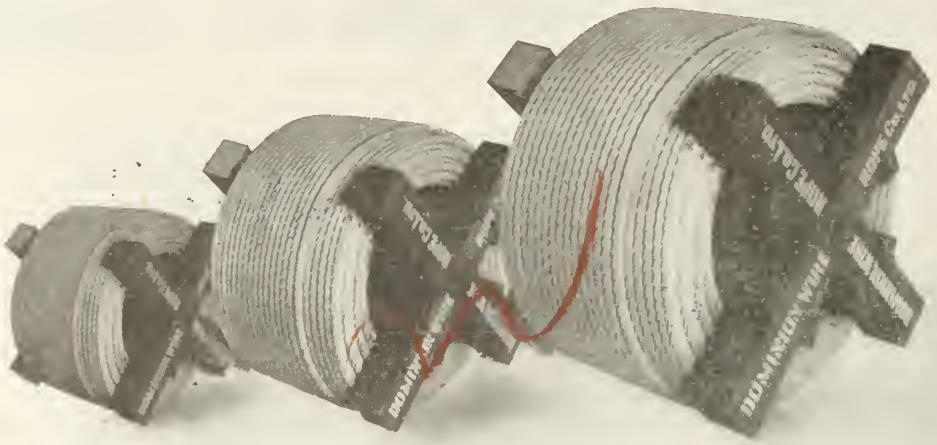

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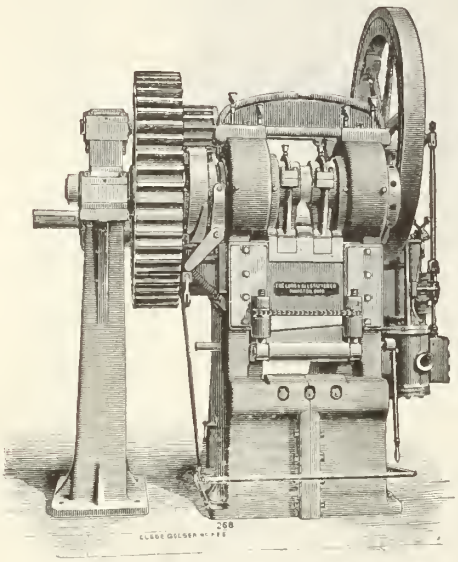

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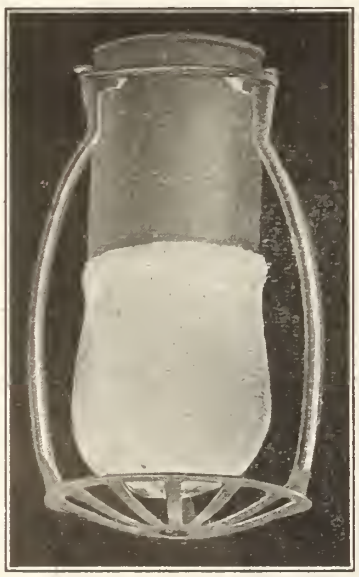

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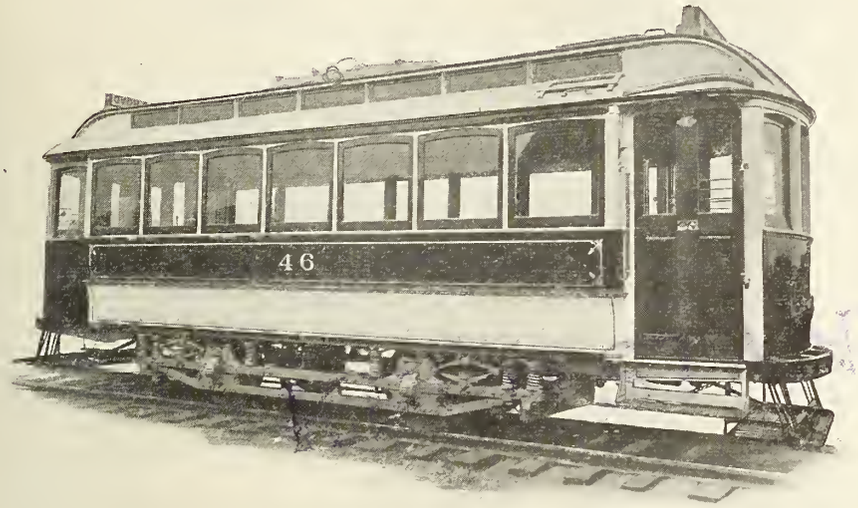

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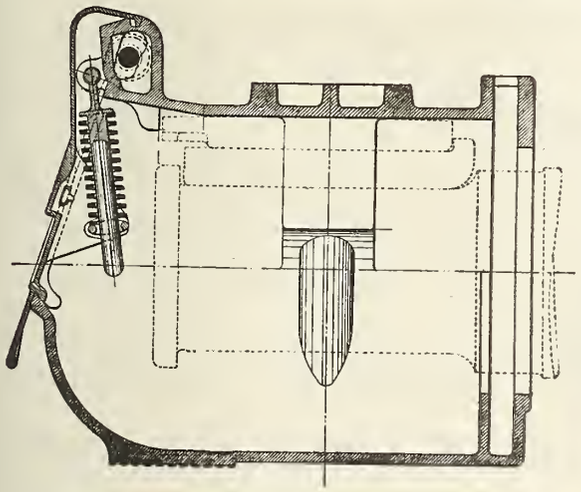

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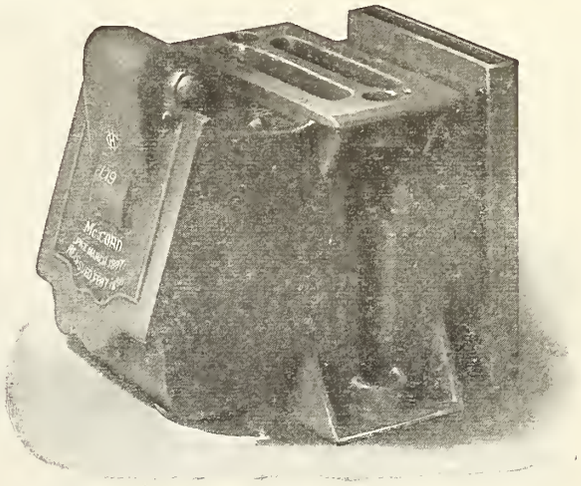

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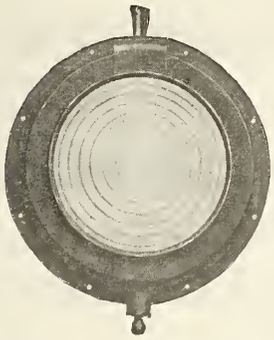

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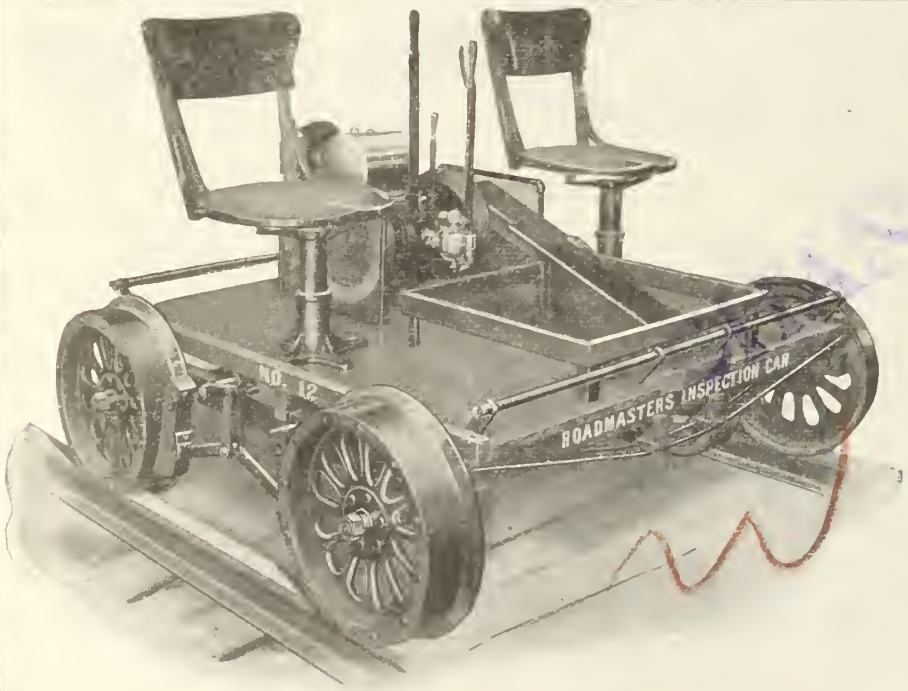

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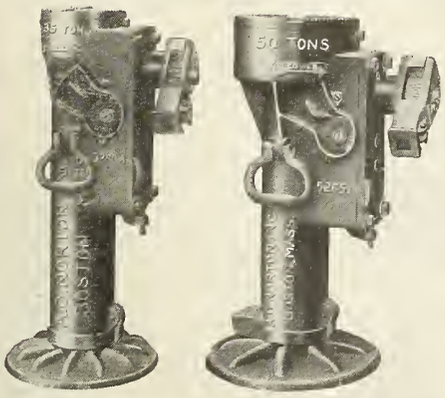

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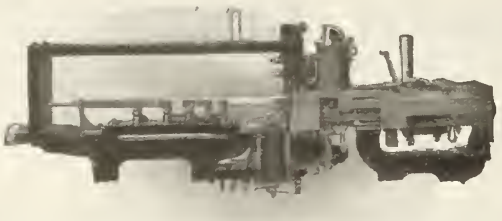

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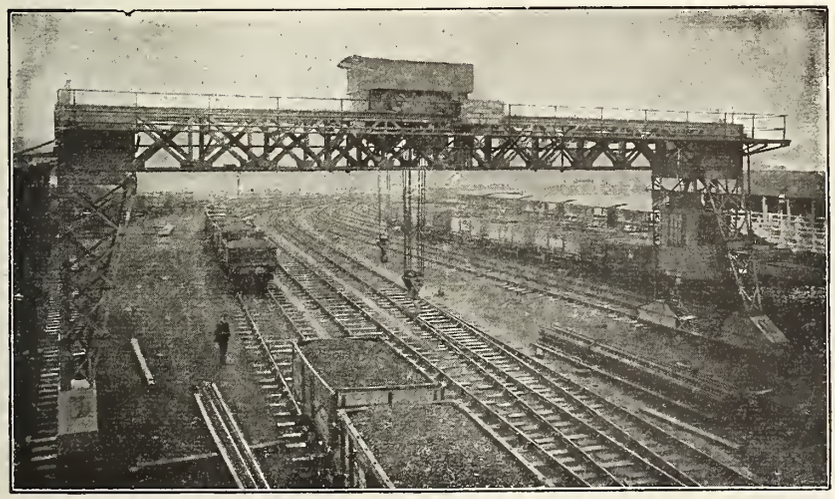

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Canadian Railway and Marine World

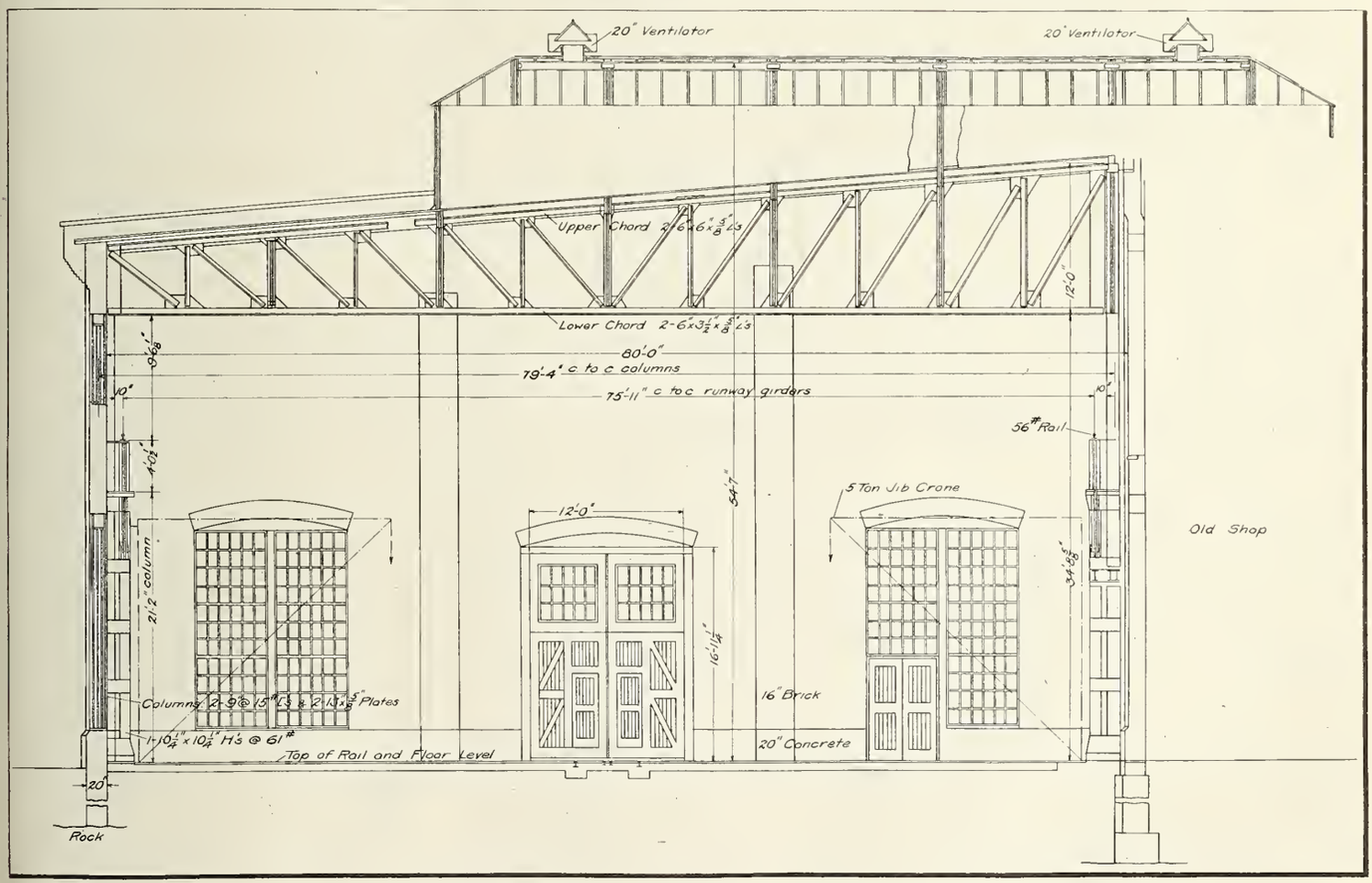
October, 1914.

Locomotive Shop Addition, Angus Shops, Canadian Pacific Railway, Montreal.

A large addition to the C.P.R. Angus locomotive shop at Montreal has been completed, and was placed in service recently, relieving certain of the departments that were materially cramped in the old shop. The addition is 594 by 80 ft., extending along the north side of the building from near the midway end of the shop, more than half way the length of the old shop. It is a structure similar in all details of design to that of the older part, consisting of a steel framework, on a concrete subwall, with red brick in the upper portion, with the roof trussed by steel spans at 22 ft. centres, which divides the addition into rail, the base of which is 25 ft. 2½ ins. above the level of the floor. Two 10 ton travelling cranes operate the length of the shop, with a clear span of 75 ft. 11 ins.

Centrally through the length of the shop, entering the latter through large doors at either end, there extends a standard gauge track, the rails of which form the outer rails of two 2 ft. gauge shop tracks. At five points in the shop length these tracks connect to similar track sets at right angles, four of which pass across the shop, from the old building to the outside of the new shop, through large doors, while the fifth only connects across into the old shop. tions would accommodate, in so far as practicable, the tool equipment for handling some of the heavier parts, in addition to providing accommodation for the fitting gangs, whose work necessarily requires that they be located as near as possible to the erecting tracks. Bringing several of the departments from their former locations in the old shop gave room for adjoining departments to expand, providing much needed room. The several departments in the addition are shown divided off by dot and dash lines in the accompanying machinery location plans.

The frame and cylinder shop occupies



Cross Section of Addition to Locomotive Shop, Angus Shops, C.P.R.

27 bays, from no. 12 of the old shop to no. 38.

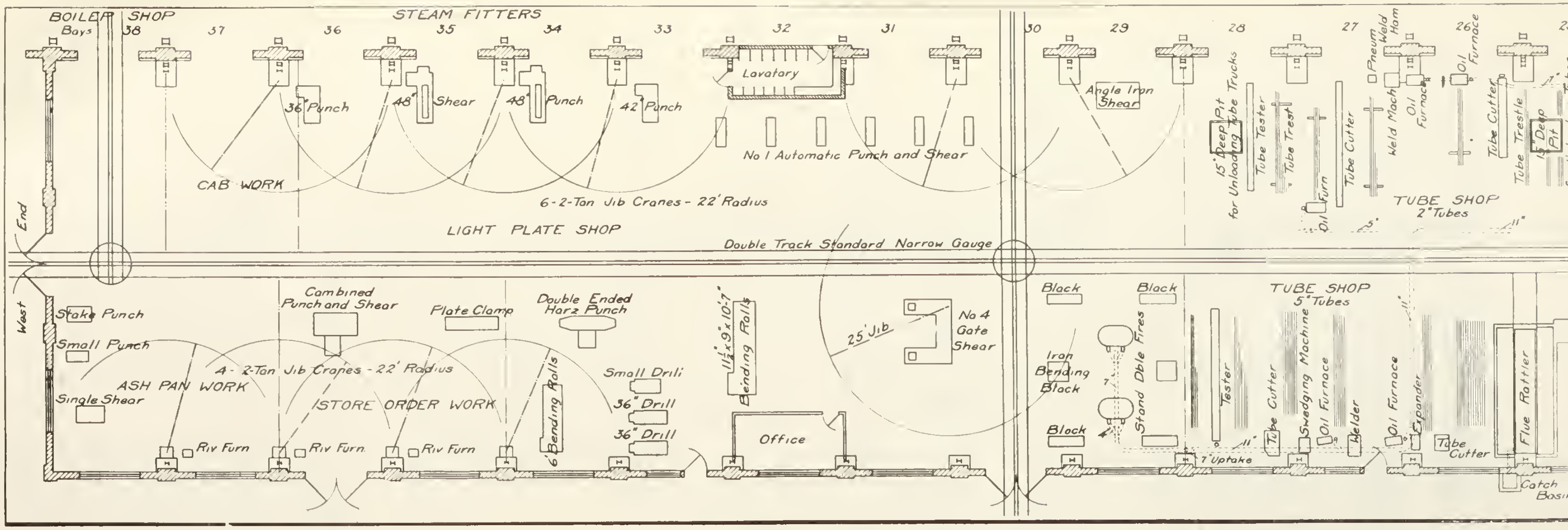
The shop addition has a clear span of 80 ft., with a clearance under the truss of 34 ft. 8⅝ ins. Over each cross bay, there is a skylight extending over a portion of the old shop. The building columns are composed of two 9 in. 15 lb. channels and two 13 by ⅝ in. plates, and the crane columns, 21 ft. 2 ins. long, are 10¼ x 10¼ ins. H. section members, at 2 ft. 0½ in. centres with regard to the building columns, these two sets of columns being tied together by 1 by ½ in. batten plates. The crane girder is 4 ft. 0½ in. deep, supporting a 56 lb. Turntables are provided at all the intersections. The partition between the old building and the new section has been knocked out with the exception of a 10 ft. width at the columns, leaving a 12 ft. opening in each bay between the shops. This provides clear communication at a large number of points through the length of the shop for the interchange of materials.

Along the adjoining wall of the old shops are located the two long erecting tracks, served by a travelling overhead crane. In consequence, in planning for the new addition, the idea borne in mind was to so rearrange the departments that the addi- bays 12 to 19 of the new shop, of the easterly 8 bays, the cylinder machine tool equipment on the north side of the central track, and the frame machinery on the south side. The cylinder machine tool equipment comprises the following:—

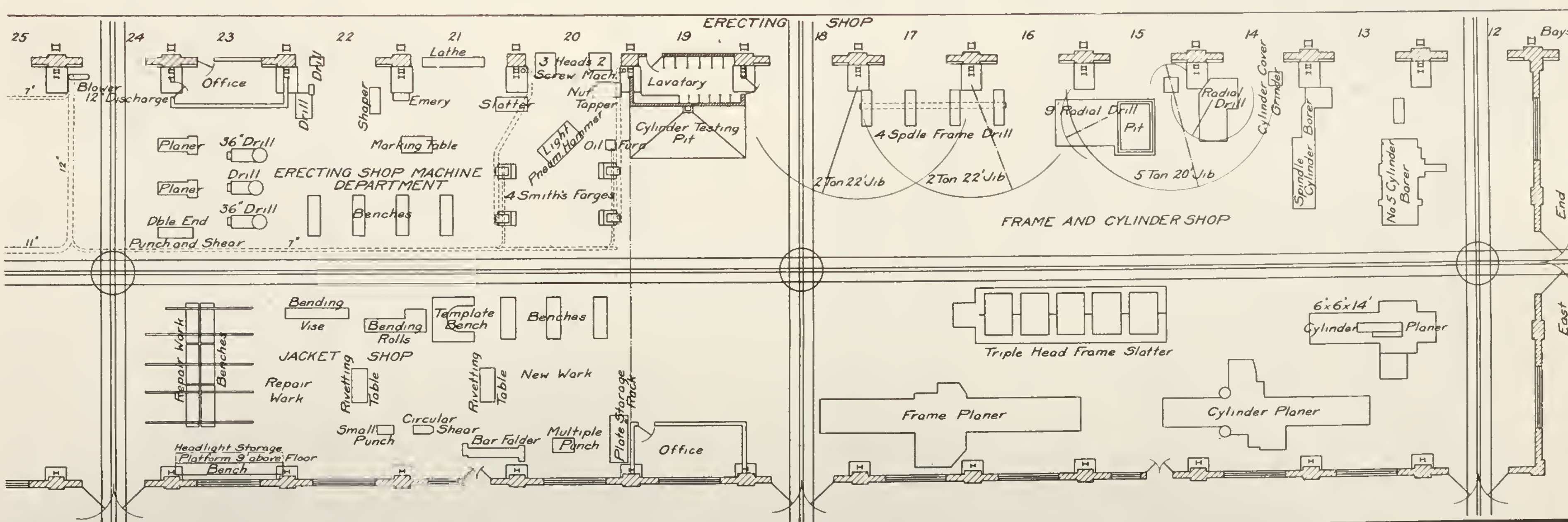
No. 5 cylinder boring machine.
3 spindle cylinder boring machine.
6 ft. radial drill.
9 ft. radial drill with pit.
6 by 6 by 14 ft. cylinder planer.
6 by 6 by 22 ft. heavy planer.
Cylinder cover grinding machine.

This equipment occupies the easterly end of the department. The frame machine tool equipment comprises:

4 spindle frame drill.



Machinery Location, Locomotive Shop Addition, Angus Shops, C.P.R., West End.



Machinery Location, Locomotive Shop Addition, Angus Shops, C.P.R., East End.

Triple head frame slotter, 24 in. stroke.
6 by 6 by 32 ft. frame planer.

This equipment occupies the westerly end of the department.

Most of the handling in this department is taken care of by the overhead travelling crane, but, in addition, the 4 spindle frame drill has two 2 ton 22 ft. jib cranes, swinging from the columns at either end, for handling the frames in and out of the machine, and for the two radial drills there is a 5 ton 20 ft. jib crane, swinging from the intermediate column. At the west end of the department there is a cylinder testing pit 22½ by 10 ft., 2 ft. below the floor level, and draining towards the back, for hydraulic cylinder tests. This adjoins one of the two lavatories in the addition, and on the opposite side of the addition is the foreman's office. The frames and cylinders enter from the erecting shop at the east end on the cross tracks, pass through the machining stages, and, in the case of the cylinders, are tested, and pass back into the erecting shop

through the other cross tracks. There are no retrograde movements.

The erecting shop machine department occupies the upper half of bays 20 to 23, and contains a complete line of equipment for such erecting work as requires to be performed on the spot, without passing on to any special department. It is well equipped with the following machinery:

Double head screw machine.
Triple head screw machine.
Slotter, 12 in. stroke.
500 lb. pneumatic power hammer.
4 blacksmith fires.
Oil furnace.
24 in. engine lathe.
24 in. shaper.
Colburn drill.
20 in. drill.
Three 36 in. drill presses.
Two 30 by 30 in. by 4 ft. planers.
Double end punch and shear, 16 in. gap.

In addition, there are four benches and a marking off table. Both the blast and exhaust for the blacksmith fires are under the floor.

The jacket shop occupies the same bays of the new addition to the south of the through shop tracks as the erecting shop machine department. It is divided into two sections, for the new work and for the repair work, and contains the following equipment:

Multiple punch.
Bar folder.
Circular shears.
Small punch, 18 in. stroke, 3-8 in. capacity.
Bending rolls.
Bending vise.

For the new work, there are in addition a template bench, three ordinary benches, and a rivetting table, while for the repair work there is a row of benches. To the south of this latter row there is a small overhead storage platform, 9 ft. above the floor level, for headlight storage, with a bench beneath.

Bays 25 to 28 inclusive contain the tube departments, the upper portion for the small 2 in. tubes, and the lower section for the 5 in. superheater flues. At the east end of this department there is a through track on which the tube lorries may be brought from the erecting shop directly, or from outside storage in the yard to the south. Just inside the door there is a flue rattler, used for all tubes, from which point the tubes pass through either of two paths, depending on size. The 2 in. tube section contains an unloading pit, in which the tube lorries are set, and from which they pass to the tube cutter alongside. From here they pass in succession through the oil furnaces to the welding machine, pneumatic hammer, tube cutter, oil furnace and tube tester, finally coming out complete for loading on lorries in a similar loading pit to that on which they were unloaded. The passage of the 5 in. tubes through that section is in a similar manner. There are no retrograde movements with either the 2 or 5 in. tubes, in both cases the sequence of steps being in order so as to pass the tubes from end to to end of the department.

Most of the balance of the shop is occupied by the light plate department, which contains the following equipment:

Two double blacksmith fires.
100 in. gate shear.
Angle iron shear.
Automatic punch and shear for tank plates.
Bending rolls, 12 ft. housings.
Three 36 in. drill presses.
Bending rolls, 6 ft. housings.
Double horizontal punch.
Punch, 42 in. throat.
Two punches, 48 in. throat.
Punch, 36 in. throat.

This department is served by several jib cranes, all as shown.

The plate storage is outside the building, adjoining the track passing out from bay 30. On this track the plate is brought into the shop, where it is first of all handled by the large gate shears, which cut it up to the desired sizes, and then pass it on for the subsequent operations, the central location of these large shears facilitating the handling of the plate work.

Bay 37, above the through track, is reserved for cab work.

The lower part of bays 35 and 36 contains the store order section, and is equipped with a double punch and shear, 24 in. gap, and also a plate clamp and two rivet furnaces. It is served by two jib cranes. The balance of the lower side of the shop contains the ash pan work section, equipped with:

Stake punch and rivetter.
Punch, 18 in. throat.
Single shear.
Rivet furnace.

We are indebted to W. Peterson, Shop Engineer, Angus Shops, for the data on which this article is based.

Proposed Increases for Exclusive Use of Drawing Rooms and Compartments.

Commissioner McLean, of the Board of Railway Commissioners, has given the following judgment, concurred in by three of the other Commissioners, Messrs. Drayton, Scott and Goodeve:—

Following the hearing in Montreal of January 23 and 24, 1911, orders went approving of the basis of maximum sleeping and parlor car tolls on railways subject to the Board's jurisdiction. These orders made provision for publication of tariffs so approved in at least two consecutive weekly issues of the Canada Gazette. These tariffs, therefore, covered the maximum rates legally applicable on lines subject to the Board's jurisdiction. To take the G.T.R. tariff C.R.C. E-1989 as typical, the provision contained as to drawing room and compartment car fares is as follows:—

"Drawing rooms in standard sleeping cars —Three and a half times charge for lower berths, sufficient being added to make the charge end in a multiple of $1. Minimum charge, $6.

"Compartments in standard sleeping cars —Two and four-fifths times charge for lower berths, sufficient being added to make the charge end in a multiple of 50c. Minimum charge, $5.

"Drawing room in parlor cars or for day runs in standard sleeping cars—Six times charge for seats, not exceeding charge for drawing room in night service between same points.

"Compartments on day runs of standard sleeping cars—Four times charge for seats, not exceeding charge for compartment in night service between same points."

This accommodation was available, on the payment of the above fares, to the holder of one passenger ticket.

In Feb., 1914, tariffs were filed by the railways providing for additional passenger fares in case of exclusive occupancy of a compartment or of a drawing room. The following from G.T.R. tariff C.R.C. E-1989 is typical of the arrangement:—"A minimum of 1½ passage tickets (including 1½ extra fare tickets on extra fare trains between points where extra fares apply) will be required for the exclusive occupancy of a compartment and 2 adult passage tickets (including 2 extra fare tickets in extra fare trains between points where extra fares apply) for the exclusive occupancy of a drawing room, in addition to proper sleeping and parlor car tickets."

Following this the Board, by its order 21413 of Feb. 27, 1914, suspended, as to their operation between points both of which were in Canada, the tariffs of certain railways subject to its jurisdiction.

The matter was heard on Mar. 17, 1914. The position put forward by the railways at the hearing was in substance that there was not an adequate payment being made for the use of the compartment, or of the drawing room. It was further stated that under existing arrangements an individual could, on payment of the appropriate compartment or drawing room fare, have the use of this exclusive accommodation on one passenger ticket, and it was stated that this worked detrimentally, in that on occasion two individuals might desire to have the accommodation in question, but would be prevented from doing so on account of its already being purchased by one traveller. The effect of this, from the railway's standpoint, was that where two passenger tickets might have been sold in connection with the accommodation in question only one had been sold. From what was said such an occurrence must be relatively infrequent. In the course of the investigation, which ended in Jan., 1911, it was testified that only about 5½% of the total passenger traffic of the C.P.R. was carried in sleeping cars. It was stated by Mr. Flintoft, for the C.P.R., at the present hearing, that about 3% of the sleeping car traffic was represented by the case where an individual had the exclusive occupancy of the drawing room. These are mere averages, of course, and cannot be taken as being necessarily final. It would, however, appear on these computations that the grievance complained of was concerned with only a small fraction of 1% of the total passenger traffic. It does not appear that the hypothetical two individuals who would use the accommodation, if it were not already occupied exclusively by one person, will, on this account, abstain from travelling; and if they do not abstain from travelling the railway will be in the same position as to passenger fares. Whether two passenger fares are received in connection with the use of a section and one for a drawing room, or vice versa, will not affect the passenger returns of the railway since in either case three passenger tickets are purchased.

There was not at the hearing an application by the railways to raise the standard sleeping car rates. There was in effect an application to increase the passenger rate

George Bury on the General Situation.

George Bury, Vice President, C.P.R., in charge of Western Lines, has issued the following message to the people of Western Canada:—"My personal advice is that this is a time when people should above all things hold their heads. Through life our greatest sufferings are through anticipating troubles that never come. The West this year will receive more for its crops, cattle, etc., than last year. Foreign capital will not come in until the war is over, but I do not know that this is an unmixed evil. It may hold back some development, but we have been borrowing recklessly, and it had to come to an end anyway. I believe legitimate business will not suffer on account of the war, and that the effective steps taken by the Government will make a monetary crisis impossible. The Empire's existence is at stake, and every one must present a bold and cheerful front and be prepared for every sacrifice should the worst come, which at present appears impossible."

under certain conditions. The case for the increase of the passenger rate has not been made out, and the order of suspension above referred to should be replaced by an order disallowing the tariffs within the scope set out by the order. As has been indicated, it is contended that at times an individual may have the exclusive occupancy of a drawing room or of a compartment when two individuals desire this accommodation. It, no doubt, would be a convenience under such circumstances for the two individuals in question to have the first chance of purchasing the accommodation. If the railways desire to cover this situation, it would seem that a rule could be drafted providing that compartment or drawing room accommodation will not be sold to an individual for his exclusive occupancy until either within a certain time before the train leaves or after the train is in motion. And in this way the question of the convenience of the two individuals so often referred to during the hearing could be adequately provided for.

Automatic Signalling on the Victoria Jubilee Bridge, Grand Trunk Railway.

The G.T.R. put into service recently its new a.c. automatic signals across the Victoria Jubilee Bridge and the approaches thereto, thereby replacing the old disc signals which had been in continuous service for 14 years. The Victoria Jubilee Bridge across the St. Lawrence River, which connects the Island of Montreal with the mainland, is one of the largest bridges on this continent, having accommodation for two steam and one electric railway tracks and also a large roadway and footpath. The steel work is about 6,600 ft. long. This new a.c installation included the equipping of the double track from Point St. Charles on the Montreal end, to Saint Lambert on the south shore of the river—a distance of about 3½ miles. At the St. Lambert end the automatics tie into the new 64 lever G.R.S. all electric interlocking plant. Four other railways lease running rights from the G.T.R. over this bridge, viz., the Central Vermont, the Delaware & Hudson, the Quebec Montreal & Southern and the Intercolonial. On account of extremely heavy traffic the length of the blocks was made comparatively short, ranging from 2,500 to 3,600 ft.

The installation in general follows the latest recommended practice in a.c. signal work. The signals are the Union Switch & Signal Co.'s top post T-2 mechanism, operated by a single phase 110 volt, 60 cycle a.c. induction motor. The so called wireless control circuits are used, employing the 12 polyphase three position relay; the local coils of these relays receive their energy at 12 volts potential from the track transformers. Track transformers also supply the energy for track circuits and electric signal lamps. All signals are electric lighted by 2 c.p. 2½ watt 6 volt tungsten lamps burning in multiple; convertible R.S.A. lamps equipped with model 9 electric sockets are used.

The centre span of the bridge has a steel floor system, which necessitated the use of a trap circuit; two vane type relays are used on this trap circuit; the circuit employed is shown in fig. 2.

All main line switches are equipped with universal switch circuit controllers and Z type switch indicators, operating at 110 volts. The indicators are of the normally energized type, standing when clear at 45 degrees in the upper right hand quadrant.

The high and low tension line wires are supported on a single cantilever cross arm, the two high tension wires being placed on the outside and spaced 18 ins. apart and the low voltage wires on the inside and spaced 12 ins apart. On the bridge this cantilever cross arm is attached to the vertical bridge members, and off the bridge to the Montreal Light, Heat and Power Co.'s steel poles, which run along the G.T.R. right of way. Due to the difficulty of double arming, a special forked bracket pin was used, set on a single cross arm, as shown in fig. 1.

No. 6 B. & S. gauge hard drawn D.B.W.P. insulated copper wire was used for the high tension line. Solderless cable taps were used to connect the leads running from the high tension line to the transformer primaries. No. 10 B. & S. gauge 40% copper clad line with D.B.W.P. insulation was used for the low voltage line. Copper line sleeves were used throughout in making all joints in line wire.

Fig. 1. Automatic Signalling on Victoria Jubilee Bridge, G.T.R.

On the bridge proper all wires are enclosed in sherardized conduit, with condulet fittings, so that in no case are wires exposed. No wooden trunking whatever is used on the bridge structure. Reference to fig. 1 will show the general idea of how the conduit work was installed.

On the bridge structure proper great difficulty was experienced in getting the necessary clearance for the signal blade without placing it so high as to have it obscured from the locomotive man's view by the steel work. The difficulty was overcome by using a style T-2 dwarf signal mechanism, set on a steel cantilever platform which was riveted to the end post of the truss. The spectacle casting was a special design with the blade attached to the bottom of the casting, so as to give it the maximum clearance and best view yet arranged, so that as it moved from the stop to clear positions at no point would the clearance be decreased over that of the blade in the stop position. The platform, signal mechanism, and spectacle are clearly shown in fig. 1. On the same platform is mounted an ordinary relay post and box, in which are placed the relays, track transformer, reactances, and low voltage lightning arrestors. The line transformer and high voltage lightning arrestors are also mounted on the platform. Reference to fig. 1 will show the general arrangement.

Power for operating these signals is obtained over a single phase 60 cycle, 2,200 volt transmission line. Under normal conditions power is purchased from the Montreal Light, Heat and Power Co. The a.c. transmission line is sectionalized at two points, so that a transmission line failure will not necessarily tie up the entire installation. General Electric Co. double pole form P outdoor type oil switches are used for this purpose. At the east end of the bridge the switch is mounted on the transmission pole line. The pole is provided with steps and painted white, so as to facilitate finding it at night in case of failure The sectionalizing switch at the west end of the bridge is mounted on a steel platform attached to a large A frame steel transmission line support of the Montreal Light, Heat and Power Co.

General Electric Co. multigap type form F2 lightning arrestors, enclosed in asbestos lined weather proof wooden boxes, are used to protect the high tension transmission line. Two of these are placed at every transformer location. Off the bridge structure no. 3 paragon ground cones, set in coke,

were used for high tension lightning arrestor grounds. On the bridge structure, both the high and low tension lightning arrestors were grounded to the steel work of the bridge. A bare no. 6 B. & S. gauge 40% copper clad line wire was strung the entire length of the bridge and grounded at each end through a no. 3 paragon ground cone set in coke. At each signal or transformer

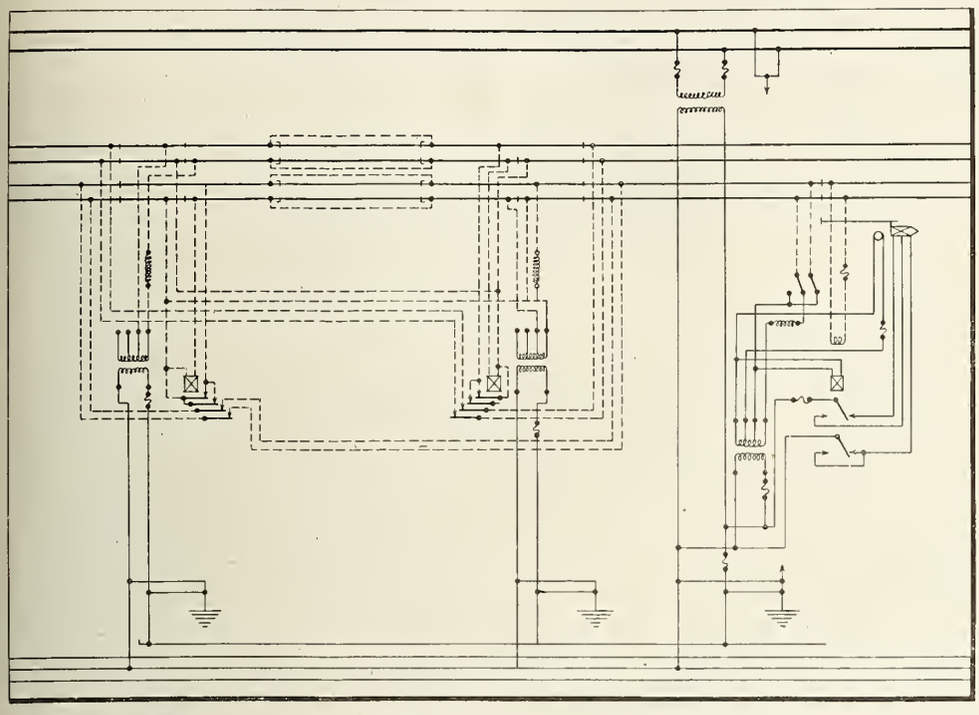


Fig. 2. Automatic Signalling on Victoria Jubilee Bridge, G.T.R.

location the bridge structure was connected to this ground wire. Off the bridge structure the low tension lightning arrestors were grounded through a coil of 12 turns of no. 6 B. & S. gauge bare copper wire placed one foot below the concrete foundation. Low voltage lightning arrestors were used in all wire leads to either line or track.

In the St. Lambert interlocking plant there was installed an auxiliary power supply consisting of a storage battery, d.c.-a.c motor generator set, and step up transformer, together with the necessary switching apparatus. This auxiliary plant has sufficient capacity to operate the interlocking plant and a.c. signal system for about five hours. Due to the extremely heavy traffic over this installation absolute continuity of signal service was essential, and therefore an auxiliary power supply was installed. The Montreal Light, Heat and Power Co. brings its energy into Montreal over six independent power lines, and in addition has a large reserve steam plant, so that a power failure lasting more than five hours should be a very rare occurrence.

The former power equipment at the St. Lambert all electric plant was enlarged and changed to provide both the d.c. for the all electric interlocking plant, and in cases of emergency, a.c. energy for the a.c. signal system.

Fig. 3 shows diagrammatically the arrangement of this apparatus. Normally 3 phase 60 cycle energy at 2,200 volts is purchased from the Montreal Light, Heat and Power Co. This is stepped down to 220 volts, by 3 single phase out door type transformers mounted on a pole outside the tower. This 220 volt energy is then led to a special 3 phase a.c. induction motor which drives a d.c. generator. This generator is used to charge two storage batteries—one of 80 ampere hour and one of 120 ampere hours capacity. Switch board equipment is such that any one of the following combinations can be arranged:—

(a) Charge both batteries at the same time.

(b) Charge either battery separately.

(c) Charge one battery and have the other supplying energy for the all electric interlocking plant.

(d) Have one battery supplying energy for the all electric interlocking plant and the other supplying energy to operate the d.c.-a.c motor generator set.

(e) Have either battery supply energy to the all electric interlocking plant.

Normally the a.c. signal transmission line is fed right off one phase of the 2,200 volt 3 phase a.c. line entering the St. Lambert interlocking tower. Should this energy fail, a circuit breaker would automatically open. The auxiliary power set would then start up, the 200 ampere hour storage battery supplying the energy necessary to operate both the a.c. signal system and the d.c. all electric interlocking plant. The d.c. generator is run as a motor, and the special 3 phase induction motor is operated as a single phase a.c. generator supplying a.c. 60 cycle energy at about 200 volts. This is then stepped up to 2,200 volts and fed out on the a.c. signal transmission line.

The d.c.-a.c. motor generator-generator motor set is mounted on a concrete foundation. Beside this are mounted the two switch board panels, and beyond is the storage battery room. On the wall are mounted the disconnecting switches and fuse blocks. All transformers are of the out door type and located on poles outside the tower. All wire leads between pole line, transformers and tower are in cable enclosed in sherardized conduit.

This installation is said to be the first of its kind in Canada. The signal apparatus was manufactured and installed by the Union Switch and Signal Co. Switch boards and power equipment were purchased from the General Electric Co. and installed by G.T.R. forces. We are indebted to R. F. Morkill, Signal Engineer, G.T.R., for the foregoing information.

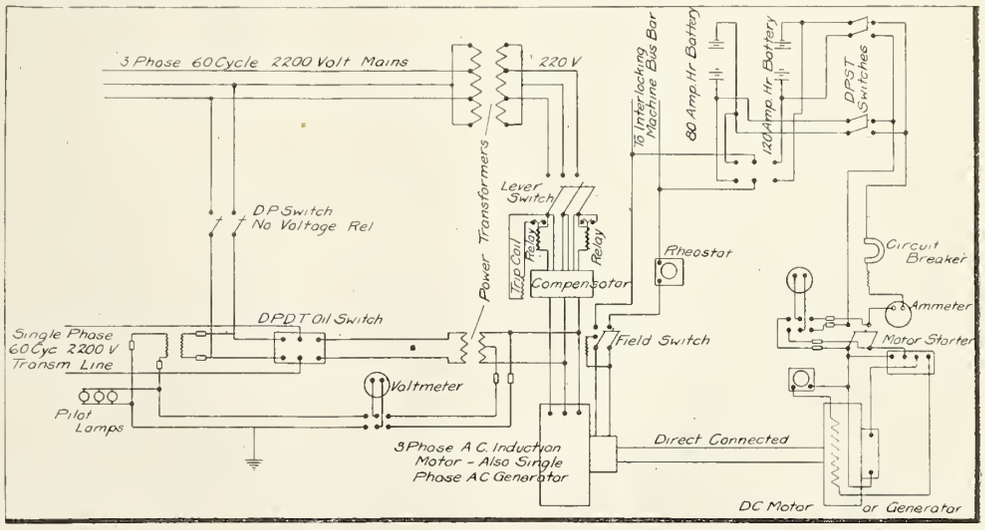


Fig. 3. Automatic Signalling on Victoria Jubilee Bridge, G.T.R.

A Tribute From Japan.

In our issue of January last, in announcing a change in Canadian Railway and Marine World's subscription price, we said:—

"As a sample of letters received from time to time we may quote one from one of the principal general officers of the Canadian Pacific Railway, who wrote as follows: 'I look upon Canadian Railway and Marine World as THE paper which anyone interested in Canadian railway or marine matters has to take and read in order to be posted. I would not be without it for considerably more than the price of admission.' Another well known railway man, in remitting his renewal subscription recently, wrote:—'I am ashamed to send so small a trifle for so valuable a publication.'"

W. T. Payne, Manager, Trans-Pacific Steamship Line, Yokohama, Japan, in remitting his renewal subscription recently, attached a clipping of the above extract to his letter and wrote on it:—"I agree." Such unsolicited tributes are an encouragement to still greater efforts to merit approval.

Pere Marquette Rd.—An inquiry is being made under the direction of the Interstate Commerce Commission into this company's affairs. The inquiry will cover the financial history of the road, including its connection with the Cincinnati, Hamilton and Dayton Rd., as well as the physical condition of the property, its equipment and operation.

The total unobstructed air openings in the locomotive ash pan need not exceed the total tube area, nor must they be less than 75% of the total tube area.

Poles Purchased in Canada in 1913.

Reports received from 424 pole purchasers in Canada in 1913 were used as a basis for the statistics in this bulletin. These purchasers consisted of 218 telephone companies, 155 electric light and power concerns, 29 electric railways, 18 steam rail ways and 4 telegraph companies. The statistics have been divided into two main groups:—First, those received from steam railway, telegraph and telephone companies, and second, those received from electric railway, power and light concerns.

Table I. gives the details of the poles purchased in Canada in 1913 by kinds of wood divided into these two main classes.

The consumption of wooden poles in Canada varies greatly from year to year. There was a decrease of about 30% in the numbers purchased from 1910 to 1911, an increase of 3.9% from 1911 to 1912, and a decrease of 12.2% from 1912 to 1913.

Eastern white cedar (Thuja occidentalis) still heads the list, as it has always done in the past. The supply of good eastern white cedar poles, however, is visibly decreasing, as is demonstrated by the fact that at least 20% of the poles purchased in 1913 were imported from the United States. The western species, red cedar (Thuja plicata), is more abundant and is now taking the place of the eastern species, especially in the greater length classes. Poles of this wood are used extensively in the western provinces and more particularly in British Columbia, where this tree grows. In the prairie provinces the poles are about half of the eastern species and half of the western. Of the red cedar poles purchased in 1913 over 8% were imported from the Pacific states and were classed as "Idaho red cedar," although these are of the same species as those obtained from British Columbia.

Out of a total of 534,592 poles, 12.1% were reported as having been imported from the U.S. in 1913. While the total number was a decrease from 1912 to 1913 the total value showed an increase of 6.7%, caused by an increase in the average price amounting to $0.39.

Table 1.

	1912. Number.	Value.	Av. Value.	Per Cent.	1913. Number.	Value.	Av. Value.	Per. Cent.
TOTAL OF ALL USES.								
Total	608,556	$1,113,524	$1.83	100.0	534,592	$1,188,331	$2.22	100.0
White cedar	378,369	613,580	2.83	62.2	264,267	525,853	1.99	49.4
Red cedar	144,222	408,472	2.83	23.7	145,569	488,138	3.35	27.2
Tamarack	36,158	46,822	1.29	5.9	115,517	155,682	1.35	21.6
Spruce	9,127	10,334	1.13	1.5	5,228	6,046	1.16	1.0
Jackpine	1,790	2,710	1.51	0.3	1,450	1,299	0.90	0.3
Balsam fir	38,000	30,400	0.80	6.2	1,437	1,841	1.28	0.3
White pine	....	....	..	..	682	8,095	11.37	0.1
Chestnut	228	147	0.64	*	167	94	0.56	*
Cypress	....	....	..	..	128	1,056	8.25	*
Hemlock	50	65	1.30	*	92	32	0.35	..
Western larch	....	....	..	..	39	163	4.18	*
Ash	....	....	..	..	16	32	2.00	*
Douglas fir	612	994	1.62	0.1	..	..	..	..
STEAM RAILWAYS, TELEPHONES AND TELEGRAPHS.								
Total	549,560	830,793	1.51	100.0	469,521	833,259	1.77	100.0
White cedar	341,240	462,964	1.36	62.1	230,360	382,657	1.66	49.1
Red cedar	122,925	278,846	2.27	22.4	115,714	282,389	2.44	24.6
Tamarack	36,158	46,822	1.29	6.6	115,212	152,675	1.33	24.5
Spruce	8,567	7,869	0.92	1.6	4,393	4,150	0.94	0.9
Jackpine	1,790	2,710	1.51	0.3	1,450	1,299	0.90	0.3
Balsam fir	38,000	30,400	0.80	6.9	1,437	1,841	1.28	0.3
White pine	....	....	..	..	682	8,095	11.87	0.1
Chestnut	228	147	0.64	*	167	94	0.56	*
Hemlock	40	40	1.00	*	90	27	0.30	*
Ash	....	....	..	..	16	32	2.00	*
Douglas fir	612	995	1.63	*	..	..	..	..
ELECTRIC RAILWAYS, POWER AND LIGHT.								
Total	58,996	282,731	4.79	100.0	65,071	355,072	5.45	100.0
White cedar	37,129	150,615	4.06	62.9	33,907	143,196	4.22	52.1
Red cedar	21,297	129,626	6.09	36.1	29,855	205,749	6.89	45.9
Spruce	560	2,465	4.40	0.9	835	1,896	2.27	1.3
Tamarack	....	....	..	..	305	3,007	9.89	0.5
Cypress	....	....	..	..	128	1,056	8.25	0.2
Western larch	....	....	..	..	39	163	4.18	*
Hemlock	10	25	2.50	*	2	5	2.50	*

* Less than a tenth of one per cent.

Telephone, telegraph and railway companies operating telephone and telegraph lines used 87.8% of all the poles purchased in Canada in 1913. This is a decrease in numbers of 14.6 and an increase in value of 0.3%, the average value to these companies increasing by $0.26. All the jackpine, balsam fir, white pine, chestnut and ash poles were purchased by this class of companies.

The electric railway, power and light companies' purchases formed only 12.2% of the total, but these poles cost on an average $3.68 more than those purchased by the telephone and telegraph companies.

The total number was an increase of 10.3% over 1912, while the average price was an increase of $0.66. These companies imported over 5% of the poles they used in 1913. They purchased all the cypress poles imported into Canada during that year and also all the western larch poles from British Columbia.

The average prices given for certain kinds of poles which have been purchased in small quantities cannot be considered as indicative of the intrinsic value of that particular wood for pole purposes, or even as a fair gauge of its market value, as these individual prices are affected by so many outside conditions such as cost of transportation, size, etc.

Table 2 gives the details of the poles purchased in Canada in 1913 by kinds of wood and divided into five length classes.

The majority of the poles purchased in 1913 were less than 25 ft. long, and of this class the two cedar species and eastern tamarack together formed over 97%. All the chestnut and ash poles were of this length, and the eastern tamarack poles were more numerous in this class than those of western red cedar, which is only true for this length class.

In the 26-30 ft. class the two cedars formed together 98.9% and tamarack poles became of little relative importance. While the cedar species still formed by far the greater part of the poles in the 31-35 ft class, spruce poles became more important, and cypress poles appeared for the first time. White pine and western larch poles appeared in the 36-40 ft. class, and here red cedar became more important than white, which is not the case with the shorter classes of poles. In the class of poles over 40 ft. long, red cedar formed over two thirds of the total.

A diagram in connection with this paper appears on page 451.

Table 2.

	Number.	Value.	Av. Value.	Per Cent.	Number.	Value.	Av. Value.	Per. Cent.
	Total—All Length Classes				20-25 feet (63.8 Per Cent.)			
Total	534,592	$1,188,331	$2.22	100.0	340,865	$463,665	$1.36	100.0
White cedar	264,267	525,853	1.99	49.4	159,064	192,908	1.21	46.7
Red cedar	145,569	488,138	3.35	27.2	60,028	112,821	1.88	17.6
Tamarack	115,517	155,682	1.35	21.6	114,564	151,386	1.32	33.6
Spruce	5,228	6,046	1.16	1.0	4,357	3,972	0.41	1.3
Jackpine	1,450	1,299	0.90	0.3	1,375	1,125	0.82	0.4
Balsam fir	1,437	1,841	1.28	0.3	1,202	1,299	1.08	0.4
White pine	682	8,095	11.87	0.1	2	1	0.50	*
Chestnut	167	94	0.56	*	167	94	0.56	*
Cypress	128	1,056	8.25	*	....	....	....	....
Hemlock	92	32	0.35	*	90	27	0.30	*
Western larch	39	163	4.18	*	....	....	....	....
Ash	16	32	2.00	*	16	32	2.00	*
	26-30 feet (21.8 Per Cent.)				31-35 feet (7.1 Per Cent.)			
Total	116,297	$294,162	$2.53	100.0	38,166	$148,639	$3.89	100.0
White cedar	70,144	165,379	2.36	60.3	21,356	75,835	3.55	56.0
Red cedar	44,942	126,292	2.81	38.6	16,073	70,979	4.42	42.1
Tamarack	662	1,150	1.74	0.6	75	179	2.39	0.2
Spruce	347	892	2.61	0.3	480	972	2.03	1.3
Balsam fir	150	333	2.22	0.1	75	179	2.39	0.2
Jackpine	50	111	2.22	*	20	48	2.40	*
Cypress	....	....	....	....	75	402	5.36	0.2
Hemlock	2	5	2.50	*	....	....	....	....
Western larch	....	....	....	....	12	45	3.75	*
	36-40 feet (4.4 Per Cent.)				40 feet and over (2.9 Per Cent.)			
Total	23,939	$141,431	$5.91	100.0	15,325	$140,434	$9.16	100.0
White cedar	9,443	51,214	5.42	39.4	4,260	40,517	9.51	27.8
Red cedar	14,371	89,603	5.91	60.0	1,055	88,443	8.71	66.3
Tamarack	10	30	3.00	*	206	2,937	14.26	1.3
Spruce	43	205	4.77	0.2	1	5	5.00	*
Balsam fir	10	30	3.00	*	....	....	....	....
Jackpine	5	15	3.00	*	....	....	....	....
White pine	42	274	6.52	0.2	638	7,820	12.26	4.2
Cypress	....	....	....	....	53	654	12.34	0.3
Western larch	15	60	4.00	0.1	12	58	4.83	0.1

*Less than one tenth of one per cent.

Paint on Concrete Surfaces was discussed by the American Society of Testing Materials, recently, when the results of a series of tests were presented. Good oil paints give very satisfactory service, while water paints, or varnish, and other resinous paints do not. The oil paints are not attacked by the dry cement, and retain both texture and color.

The principles of efficient combustion will be best served if the percentage of air openings be made as large as possible without causing losses of fuel through the grate.

Birthdays of Transportation Men October.

Many happy returns of the day to:—

L. S. Brown, Superintendent, Truro, Sydney and Oxford District, Intercolonial Ry., New Glasgow, N.S., born at Nelson, N.B., Oct. 19, 1864.

R. A. Burford, cashier, C.P.R. ticket office, New York City, born at Brooklyn, N.Y., Oct. 4, 1878.

T. C. Burgess, Commercial Agent, G.T.R., Minneapolis, Minn., born at New York City, Oct. 2, 1853.

G. E. Burns, Freight Claims Agent, Eastern Lines, C.P.R., Montreal, born at St. Thomas, Ont., Oct. 6, 1863.

K. J. Burns, Assistant General Freight Agent, Great Northern Ry., Vancouver, B.C., born at Rochester, Eng., Oct. 11, 1878.

F. F. Busteed, C.E., Engineer in charge of C.P.R. revision and second tracking, west of Calgary, Kamloops, B.C., born at Battery Point, Que., Oct. 10, 1858.

J. M. S. Carroll, District Manager, Canadian Consolidated Rubber Co., Montreal, born at Ballarat, Australia, Oct. 22, 1877.

C. E. Cartwright, M. Can. Soc. C.E., ex-Division Engineer, C.P.R., Vancouver, B.C., born at Toronto, Ont., Oct. 13, 1864.

G. S. Cooke, Superintendent Grand Trunk Pacific Ry., Melville, Sask., born at Montreal, Oct. 27, 1875.

A. F. Dion, Traffic Agent, Quebec Harbor Commission, Quebec, born at L'Islet, Que., Oct. 1, 1871.

L. V. Druce, Commercial Agent G.T.R. and G.T.P.R., Vancouver, B.C., born at London, Eng., Oct. 20, 1873.

C. E. Dewey, Freight Traffic Manager, G.T.R., Montreal, born at Cheshunt, Eng., Oct. 2, 1873.

C. E. Friend, General Auditor, Canadian Northern Ry., Winnipeg, born at Brighton, Eng., Oct. 12, 1871.

W. P. Fitzsimmons, Commissioner of Industries, G.T.R., Montreal, born at Detroit, Mich., Oct. 27, 1868.

A. H. Harris, Special Traffic Representative, C.P.R., Montreal, Que., born in Devonshire, Eng., Oct. 15, 1855.

G. Hodge, General Superintendent, Eastern Division, C.P.R., Montreal, born there Oct. 2, 1874.

J. H. Hughes, Assistant Superintendent, District 2, Eastern Division, Smith Falls, Ont., born at Charlottetown, P.E.I., Oct. 7, 1865.

H. Irwin, M. Can. Soc. C.E., Consulting Right of Way and Lease Agent, C.P.R., Montreal, born at Newgrove, County Down, Ireland, Oct. 27,1847.

J. W. N. Johnstone, General Passenger Agent, Reid Newfoundland Co., St. Johns, Nfld., born at Campobello, N.B., Oct. 4, 1878.

W. M. Kirkpatrick, Assistant Freight Traffic Manager, Eastern Lines, C.P.R., Montreal, born at Kingston, Ont., Oct. 8, 1874.

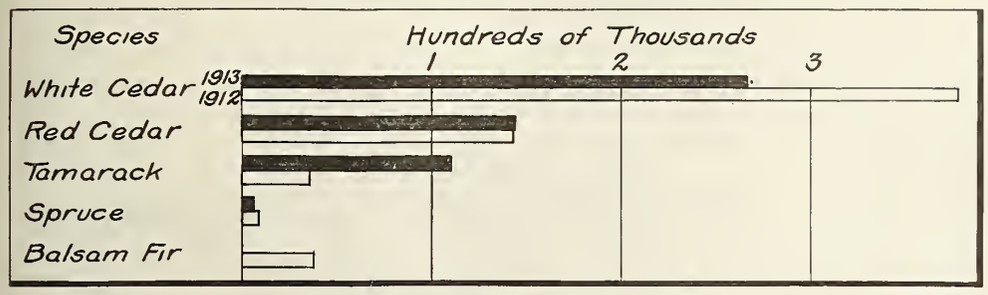
W. B. Lanigan, Assistant Freight Traffic Manager, Western Lines, C.P.R., Winnipeg, born at Three Rivers, Que., Oct. 12, 1861.

J. W. Leonard, Assistant to Vice President, C.P.R., Montreal, born at Epsom, Ont., Oct., 1858.

Sir William Mackenzie, President, Canadian Northern Ry., Toronto, born at Kirkfield, Ont., Oct. 30, 1849.

C. Malcolm, chief clerk, Auditor of Stores and Mechanical Accounts, Alberta Division, C.P.R., Calgary, Alta., born at Tatamagouche, N.S., Oct. 18, 1881.

W. T. Marlow, Import Freight Agent, C.P.R., Montreal, born at Limerick, Ireland, Oct. 25, 1872.



Poles Purchased In Canada in 1913.

R. Marpole, General Executive Assistant, C.P.R., Vancouver, B.C., born in Montgomeryshire, Wales, Oct. 9, 1850.

A General Storekeeper's Opinion.

A. E. Cox, General Storekeeper, Canadian Northern Railway, Winnipeg, writes Canadian Railway and Marine World:—"I would like to congratulate you on your excellent publication. I assure you it is looked for each month. I consider it a valuable paper for any railway man, as the subjects dealt with are so varied and applicable to all departments. My best wishes for its continued success."

H. Paton, President, Shedden Forwarding Co., Montreal, born at Johnstone, Renfrew, Scotland, Oct. 5, 1852.

J. W. Porter, acting Chief Engineer, Hudson Bay Railway, Winnipeg, born at Aberdeen, Scotland, Oct. 15, 1877.

D. Pottinger, I.S.O., ex-Assistant Chairman, Government Railways Managing Board, Moncton, N.B., born at Pictou, N.S., Oct. 7, 1843.

H. G. Reid, Master Mechanic, Lake Superior Division, C.P.R., North Bay, Ont., born at Pembroke, Ont., Oct. 27, 1863.

W. S. Rollo, joint agent, G.T.R., and Central Vermont Ry., St. Johns, Que., born at Dundee, Scotland, Oct. 8, 1852.

J. K. Savage, Superintendent, District 1, Saskatchewan Division, C.P.R., Regina, born at Forreston, Ill., Oct. 5, 1876.

Sir Thomas G. Shaughnessy, K.C.V.O., President, C.P.R., Montreal, born at Milwaukee, Wis., Oct. 6, 1853.

T. Duff Smith, Fuel Agent, Grand Trunk Pacific Ry., Winnipeg, Man., born at Barking, Essex, Eng., Oct. 2, 1868.

A. B. Spence, Travelling Auditor, Reid Newfoundland Co., St. Johns, Nfld., born at Harbor Grace, Nfld., Oct. 21, 1882.

F. Stamelen, Night Locomotive Foreman, C.P.R., Winnipeg, born at Chatham, Ont., Oct. 16, 1863.

E. Sterling, Superintendent Districts 2 and 3, British Columbia Electric Ry., New Westminster, born at Thornbury, Ont., Oct. 3. 1875.

F. B. Tapley, A.M. Can. Soc. C.E., Assistant Engineer Maintenance of Way, Eastern Lines, C.P.R., Montreal, born at St. John, N.B., Oct. 17, 1876.

E. N. Todd, Division Freight Agent, Eastern Division, C.P.R., Montreal, born at Huntington, Que., Oct. 17, 1879.

A. W. Wheatley, Manager, Canadian Locomotive Co., Ltd., Kingston, Ont., born at Ashford, Kent, Eng., Oct. 12, 1870.

L. H. Wheaton, Resident Engineer, Dartmouth branch, Intercolonial Ry., Dartmouth, N.S., born at Sackville, N.B., Oct. 5, 1869.

Canadian Pacific Railway Employes' Medical Association of British Columbia.

An organization with this title has been completed among the C.P.R. employes on the British Columbia Division, and those of the Alberta Division located between Field and Stephen, B.C. The organization is intended to replace the old medical arrangements, which, while working satisfactorily, in many cases were found to be inadequate to meet the increasing requirements. The old arrangements provided benefits for about 4,000 of the employes, leaving about 1,550 outside their operations. As many of these 1,550 employes resided at points away from a centre where medical attendance could be obtained, considerable hardships often resulted.

The new organization seeks to include every C.P.R. employe in the province, provide medical attendance for them and their families, and a certain amount of hospital accommodation at central points. The contribution of married men is fixed at $1.25 a month, and of unmarried men at $1 a month, which is deducted from the monthly pay and paid over in a lump sum by the company to the Association's treasurer. Employes may decline to join the Association, but they must give notice to that effect. The Association's management is in the hands of a committee of 18, representative of every grade of service, from the General Superintendent to the trackmen. All the appointments of medical men are made by this committee, the only exception being the Chief Medical Officer, who is appointed and paid by the C.P.R. Each medical officer has a district assigned to him, and it is his duty to attend all the company's employes and their families within that region, free transportation being provided by the company to enable him to travel over his district. The medical officers are also required to give first aid at any accident on the line. Accommodation in hospitals will be provided, under certain conditions, and it is hoped that this feature will be extended by the provision of cottage hospitals at points not now provided with public hospitals.

Medical men have been appointed at 19 points on the line outside Vancouver, and temporary arrangements have been made at such points where permanent medical men have not yet been appointed.

Steel Rail Order.—Sir Robt. Borden announced in the House of Commons during the recent short session that the Government had ordered 10,000 tons of steel rails from the Dominion Iron and Steel Co.

The amount of solid matter discharged from the locomotive stack has been found to vary from 1 to 14%, depending on the rate of firing, increasing at a much greater rate than the rate of firing.

The first locomotive made its initial trip drawing freight at Killingworth colliery, Northumberland, Eng., July 25, 1814. It weighed about six tons. To-day the largest locomotive weighs 850,000 lbs.

Railway Mechanical Methods and Devices.

Handling Power House Coal and Ashes at the Allandale Locomotive House, Grand Trunk Railway.

The G. T. R. locomotive house at Allandale, Ont., where four of the lines converge, handles a large number of locomotives daily, and a large locomotive house for handling this equipment is required. In addition there is a large machine shop for handling the running repairs. As a result the power plant, where the power for operating the machinery is generated, requires a large amount of coal for its operation. The usual custom in plants of this kind is to handle all the coal in and out of the boiler room by wheel barrow, as it has not generally been considered necessary to improve this department, which is usually considered unimportant. This condition prevailed in this locomotive house until the coal and ash handling facilities to be described were installed.

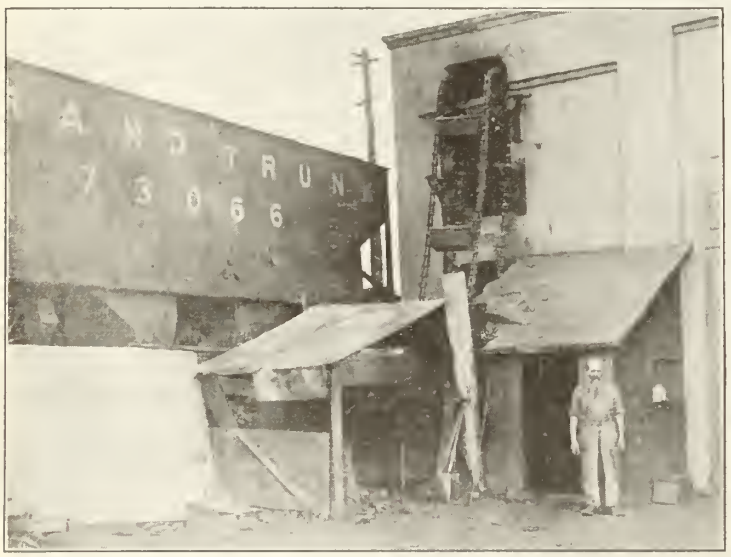


Fig. 1.—Chain Elevator for Power House Coal.

Fig. 2.—Ash Handling Crane for Power House.

The coal handling machinery is shown in the accompanying fig. 1. The coal from the cars was formerly dumped from the elevated coal car truck, in the background, and shovelled through an opening in the end wall into coal bins along that wall, in front of the boilers. As now arranged, there is an elevating mechanism, consisting of a chain belt with steel buckets, the lower end of which extends into a coal pocket, where the coal drops from the car. This is protected on one side by the wooden partition shown, which permits the operator to allow just enough coal to pass in to the chain buckets at such a rate as not to clog the machinery. The one man can operate the machinery satisfactorily. At the top of the elevating chain there is a steel chute, leading in to the coal storage bins, the sides of this chute extending about half its length. The major portion of the coal will chute along into the body of the bin, enough escaping over the unprotected sides to fill the near end. The boiler room coal doors are thus always kept with an ample supply of coal. The elevating chain is driven by a small vertical steam engine, in the shed shown to the rear of the operator. The door to the boiler room is central in the end of the building, immediately to the right of the operator's shed.

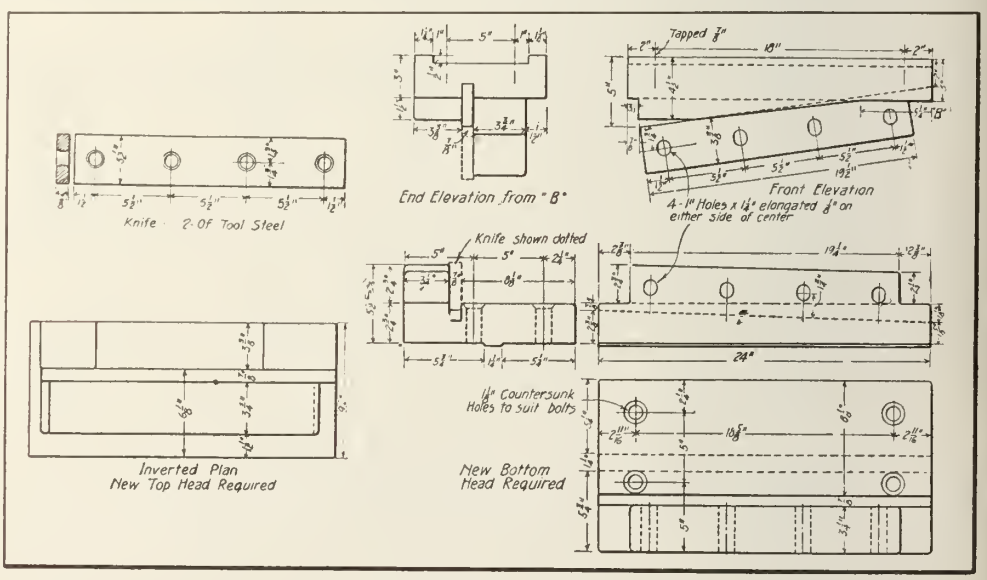
On the other side of the door opening, in the position shown in fig. 2, there is an ash handling plant. From under the boilers there is a small passage leading through the end wall as shown, in which a small ash car operates, running on light trucks. The ashes are drawn from under the boilers to this car, and run out into the outer part of the tunnel. Across this pit, there is a crane way, with a single track, extending across to the adjoining auxiliary track, on which the ash cars are located. The crane way consists of three pairs of old bridge columns, carrying a wooden beam, from the under side of which is suspended a double rail for a light trolley. The end of the trolley rail over the pit is hinged so that the pit end may be lowered to grapple with the pit car. The loose end of this trolley rail is connected with a chain passing over a sheaf on top of the end columns. The other end, being attached to the plunger of a vertical air cylinder, raises the rail section, allowing the car to be run over to the ash car for dumping. The air cylinder consists of two lengths of drop pit jack cylinders, the upper end of one of which has been cut off to shorten its length, a packed head being substituted, through which the piston passes. This packed head is bolted in place by long bolts passing down alongside the cylinder to the flange of the lower cylinder. One operator takes care of both the coal and ash handling equipment.

This plant is in charge of W. Quilter, Locomotive Foreman.

Shear Blade Economy.

By E. T. Spidy, Assistant General Foreman, C.P.R., Winnipeg.

An item involving considerable expense in the course of a year in large shops is repairs and renewals of shear blades. Almost all our large machines have shear blades that are wide at one end and narrow at the other, giving only one edge to shear on, so that when this edge becomes worn it has to be repaired or renewed. We have effected an economy in this direction by providing our shear machines with new heads that accommodate a rectangular blade that is symmetrical about the bolt holes in every respect. This allows of using all four edges of the blades both top and bottom, making each blade of new pattern. We are in consequence cutting our steel bill for blades in



Four Edged Shear Blade.

four and getting equally satisfactory results, to say nothing of the labor entailed that is saved into the bargain. The accompanying illustration shows the necessary drawings required to effect this change on one machine.—Railway Master Mechanic.

Old Vertical Boring Mill, for Boring Brasses, in Central Vermont Railway Shops.

An old style of boring mill, that was no longer of any service for general shop boring, has been utilized to good purpose in the Central Vermont Ry. shops at St. Albans, Vt., as shown in the accompanying illustration. From the design of the machine, with its light boring bar, and flimsy construction of the lower table spindle, it can readily be seen that, for ordinary service it would chatter so much as to make only the very lightest cuts possible. Two simple blocks have been clamped on the table, as shown, and held in position by the vise jaws. In these blocks two journal brasses can be slipped, and each clamped in position by the two set screws on the back. As the amount of metal removed is small, and as brass is a comparatively easy metal to cut, and the radius to which the brasses are bored is small, the boring mill has been found quite serviceable for this class of work. While

Old Vertical Boring Mill used for Boring Journal Brasses.

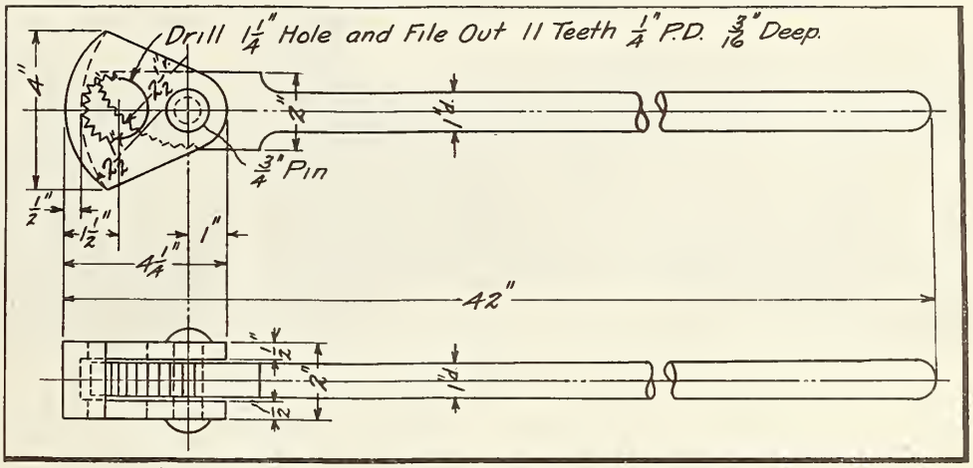
undoubtedly not as efficient in its work as a machine designed for the purpose, it has solved the problem of disposing of the old machine, and made unnecessary the purchase of a new one.

The largest European locomotive is said to be a 0-8-8-0 Mallet, built for the Bavarian State Railways, and it is also claimed that it is the first of its type to be used on the continent. The weight in working order is 122½ tons, which is distributed over 8 pairs of 3 ft. 11⅞ in. driving wheels. The cylinders are 20½ and 31½ by 25 3-16 ins., and have a working pressure of 212 lbs. The grate area is 45½ sq. ft.

Stud Wrench in Canadian Northern Railway Shops.

The accompanying illustration shows a stud wrench that has been made a standard for use in C.N.R. shops all over the system. It is made of tool steel, and is used for applying and removing stud bolts. A 1½ in. hole is drilled in the centre of the hinged portion, and 11 teeth, 3-16 in. deep, are filed out along the edge opposite the pivot pin. The swinging portion is slotted to receive the lever, which also has 16 teeth to correspond. Both sets of teeth are case-hardened.

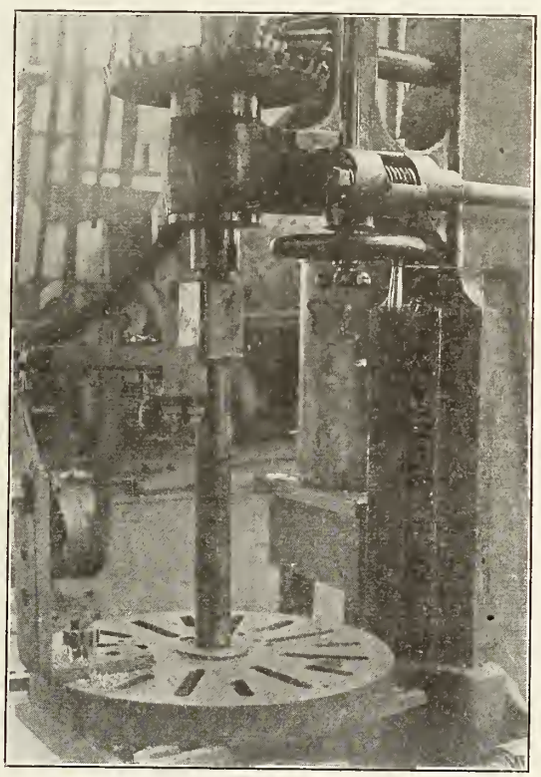
The teeth of the swinging portion are on a cam section, so that by bringing forward the handle, the full 1½ in. hole is open, and the wrench may be slipped over the projecting stud. Swinging the handle in the opposite direction causes the cam teeth to grip the stud, forcing it against the stud in the other portion, gripping the stud securely. The wrench may be swung back and forth in applying or removing, the same as a Stillson wrench, but has the advantage of not slipping off the stud, and in consequence may be operated much more rapidly.



Stud Wrench for Applying or Removing Studbolts.

Facing Driving Wheel Brasses in Drill Press at North Bay Shops, C.P.R.

It is the usual custom in the C.P.R. shops at North Bay, Ont., as at others on the system, to face locomotive driving wheel brasses in the vertical boring mill, but it frequently happens that that machine is pressed with other work, and in consequence other methods of handling the work are required, if the progress of the work is not to be interrupted. A drill press has been so rigged up that the facing of the brasses can be done on it.



Facing Driving Wheel Brasses in the Drill Press.

The arrangement is shown in the accompanying illustration. The drill press used is of the non swing table type, the table only having vertical adjustment, with no movement about the supporting column. In consequence, the drill spindle is always in perfect alignment with the table centre. A boring bar, with taper socket to fit into the drill spindle, extends through a vertical bearing in the centre of the drill table. Attached to this boring bar is a cross feeding bar, carrying a facing tool, which is fed radially by a feed screw from a star on the outer end. Bolted to the drill table there is an angle bar, to the upper end of which is attached an adjustable feed finger, through which the amount of feed can be regulated. The brass to be faced is bolted in a stationary position on the drill table, and the tool revolves over the face, machining in the usual manner. This reverses the movement from that on the vertical boring mill, the tool revolving instead of the work.

Methods of Wrecking Concrete Buildings to make room for improvements, on account of the newness of the monolithic construction, have not been developed extensively. In two recent instances of wrecking concrete structures, dynamite and the oxy-acetylene torch have been used to advantage. In the former instance, small charges of dynamite were placed at the top and bottom of the columns, dropping the girders to the floor below, where they were broken up. In the other instance, the torch was employed to cut up the reinforcing steel, when it was found that the flame would cut the concrete effectively, holes being cut, and with this start the body was afterwards broken up with sledges.

The practice of mixing one third of the empty cars in a train at the forward end, and two thirds at the rear end, appears to meet with general approval.

The Break in a Canadian Northern Railway Wharf at Port Arthur.

As stated in Canadian Railway and Marine World for August a section of the C.N.R. wharf at Port Arthur, Ont., sank on night July 4 under a load of about 2,100 tons of steel rails. The s.s. McKee had completed unloading a cargo of rails in the afternoon and had left a short time before the accident occurred. The rails were 80-lb. A.S.C.E., 33 ft. long, and had been placed in three piles, each pile being about 33 by 66 ft., with transverse spaces a few feet wide between piles. The section that failed was about 75 ft. square. Two piles of the rails were carried down with it, each pile containing about 1,050 tons. The entire length of the wharf was loaded with rails, some of the piles weighing 1,200 or more tons. The rails on the portion not wrecked were hastily loaded on cars to save from further loss and to facilitate the salvaging of lost rails.

The Break in a Canadian Northern Railway Wharf at Port Arthur.

The wharf, which was about 75 by 450 ft., was constructed in the winter of 1912-13 by the Thunder Bay Harbor Improvement Co. under the supervision of the C.N.R., according to plans and specifications furnished by the railway. The pier was built similar to the others originally used for unloading steel rails and later was covered and used for package freight as occasion demanded. It is stated that some of these older wharves had supported piles of rails weighing as much as 1,400 tons, without sign of failure.

The piles used were sound tamarack from 40 to 50 ft. long, with 12 in. butts, and were driven to hard bottom. The water varied from 12 to 20 ft. in depth. In places the bottom of the lake was covered with several feet of soft mud. No batter piles or sway bracing was used. The piles were spaced about 5 ft. each way and were capped with 12 by 12 in. fir running transversely. The longitudinal stringers were 6 by 10 in. fir, spaced 24 in. on centres. The flooring was 2 by 12 in. material. The deck is about 8 ft. above the level of the lake. The portion of the wharf which remained standing supported several piles of rails, the edge of one being only a few inches from the rupture.

Of the accompanying illustrations the left hand one shows the east end of the break and the manner in which the stringers were sheared off also a small pile of unloaded rails. The stringers were sheared off on a straight line across the wharf. The few rails shown are some of those which had been removed by derrick and diver. The right hand view shows the slip side and west end of the break, also the portion (about 12 ft.) of wharf which remained standing at that end. It shows the manner in which a section on the slip side was pushed upward. A section on the track side was pushed upward in a similar manner. These views would indicate that the first part to go was the east end of the break where the stringers were sheared off. This is proved by the manner in which the rails laid in the water. The diver who removed them states that they slid toward the east end of the break.

The foregoing information was furnished by C. E. Henderson, Assistant City Engineer, Port Arthur, to whom we are indebted for the photographs from which the illustrations were made.

M. H. MacLeod, General Manager and Chief Engineer, C.N.R., has furnished us with the following additional information:—"The construction of the dock was as follows:—Piles driven to rock at 5½ ft. centres each way, with 12 by 12 in. caps running transversely on dock, on top of which were placed 6 by 10 in. joists covered with 3 in. surface plank. Tamarack piling and British Columbia fir superstructure, all bolted and drifted together. The rails were piled interlocked to a height of 10 ft. above dock level, the load at the centre being about 1,244 lbs. per sq. ft. There were 2,129 tons of rails on the portion that failed. The damage to them was very slight. The dock is 400 by 74 ft., and the portion which collapsed was 80 ft. in length near the shore end. The dock was overloaded considerably in excess of what it was designed for, through some mistake of the men unloading the rails, as they apparently wished to complete unloading a cargo late at night."

Notes on Roadmasters' Work.

By J. W. Powers, Supervisor, New York Central and Hudson River Railroad.

Every practical trackman must admit that our railways are in a state of gradual development. If the older employes will look back 20 or 25 years and compared the past with the present they will observe a wonderful change for the better. Crude methods of track construction and maintenance have developed as the years roll by, until at the present time track work must be looked upon no less skilled and important than the work performed by other departments. This is as it should be. Every passing year should add to our experience and teach us lessons to be heeded in the future. The demand made upon railways in the way of speed, comfort and capacity makes it imperative that the permanent way be of the highest possible order and that such may be the case, requires the best talent, intellectually and physically, to have charge of maintenance of track.

In order to maintain and improve the present standard of efficiency in railway progress suitable encouragement should be given to induce ambitious and progressive men to enter this department and sufficient inducements should be given to retain them. This cannot be accomplished by the rules adopted and now in force on a prominent eastern road where the promotion of practical men is limited to that of assistant supervisor, regardless of their ability and when qualified for promotion. The writer believes the adoption and enforcement of such rules detrimental to the company's interest.

It is the writer's opinion that all employes should make every effort to qualify themselves for promotion to more important positions, as the ideal organization is one in which every man is proficient to that extent which will warrant his immediate promotion to the next higher position when the occasion offers. This is the goal for which all employes should strive and the company should give sufficient compensation and encouragement to reach.

Renewing of ties is one of the great items of cost in the maintenance of railways and the company should furnish the best ties within its means. The subject of tie renewals has been discussed from time to time and many articles have been written about it, yet there are also certain phases in it which need further discussion. The writer maintains that a great many defects in track are due to the fact that ties are not of the proper length and uniform cross section. It is his opinion that to obtain the best results, the length of the ties should be twice the gauge and they should all be of equal length, and furthermore they should be of uniform cross section.

If ties would conform to these requirements, track would remain much longer in good line, surface and gauge. It stands to reason that the effect of uniform supports placed at equal intervals under the rail would be more conducive to good track than where adjacent ties are not of uniform size and have varying bearing surface. It is customary on some roads using ties varying in length to line the ties true on one side and let the unequal lengths project on the other side. This is contrary to good mechanical principles as the support of both rails should be uniform. The proper method of putting in ties of variable lengths is to have the ends, projecting past the rails, equal.

The most appropriate time to prepare estimates for new ties needed is in the autumn If estimates are submitted at this time, it is possible to secure favorable contracts and have ties delivered when needed.

Much time and money can be saved by using good judgment in the unloading and distributing of ties. To do this all ties about to come out should be marked, care being taken not to mark any that would last one additional year, but none should be left in the track that should be removed. When distributing ties, if marked in this manner, it can be determined exactly how

many ties are needed at each point. Care should be taken to see that they are unloaded where needed. By doing this money will be saved which would otherwise be lost for time required to handle them.

If ties are not to be put in track soon after being unloaded they should be piled neatly at a proper distance from the track and small trenches dug around them to prevent them from catching fire. If ties to be piled are treated, small quantities of earth should be placed on top of the piles in addition to the trenches as treated ties catch fire more easily than untreated ties.

The most important regular work of the spring season is the renewal of ties, which should be taken in hand as soon as the road bed is in proper condition. Much more of this work can be done with less fatigue during the cool days in spring and early summer on account of the ground being soft, which makes it possible to handle ballast without using picks, which cannot be done later in the season when the ground becomes harder.

When track is to be given a ballast lift, the renewal of ties, if carried on at the same time, is facilitated and by giving a new bed to all ties, settlements will be uniform, a better surface can be obtained, and the ties to remain in the track are more easily spread or straightened. When no lift is to be given to track and it is desired to put in ties on the old bed, it can be done, if the ballast is not too dry, in the following manner: Remove the spikes from the old ties to come out and place a jack each side of the track. Raise the track sufficient to pull out old ties after ballast has been removed from end of same. Care should be taken not to raise the track high enough to allow gravel to run under ties which are to remain in track. All old ties can be removed in this way unless the ballast is too dry and the ties badly rail cut. They can be put in on old bed and but little tamping is required if they are of uniform thickness. If the new tie to be inserted is thicker than the one removed, a portion of the old bed should be cut down with a shovel or with chisel end of pick, care being taken to remove only what is absolutely necessary to avoid unnecessary tamping. When new ties are put in between old ones, which are not disturbed, they are apt to settle in spite of the care of putting them in and tamping. New ties should be left a little high to allow for settlement. Men should not be allowed to use picks to pull new ties in place, but should be furnished with tie tongs for this purpose, as the use of a pick seriously mars the top surface of the tie and induces decay. Careful spiking and gauging should be insisted upon and vigorously followed up.

The importance of uniform tamping to retain good surface cannot be over estimated. Ties should be tamped hardest about 18 ins. from and under each rail, the centres being tamped less heavily. Track in which ties have been put should be followed up the next morning and the track should be brought to perfect surface and dressed up finely to a standard section.—Maintenance of Way Bulletin.

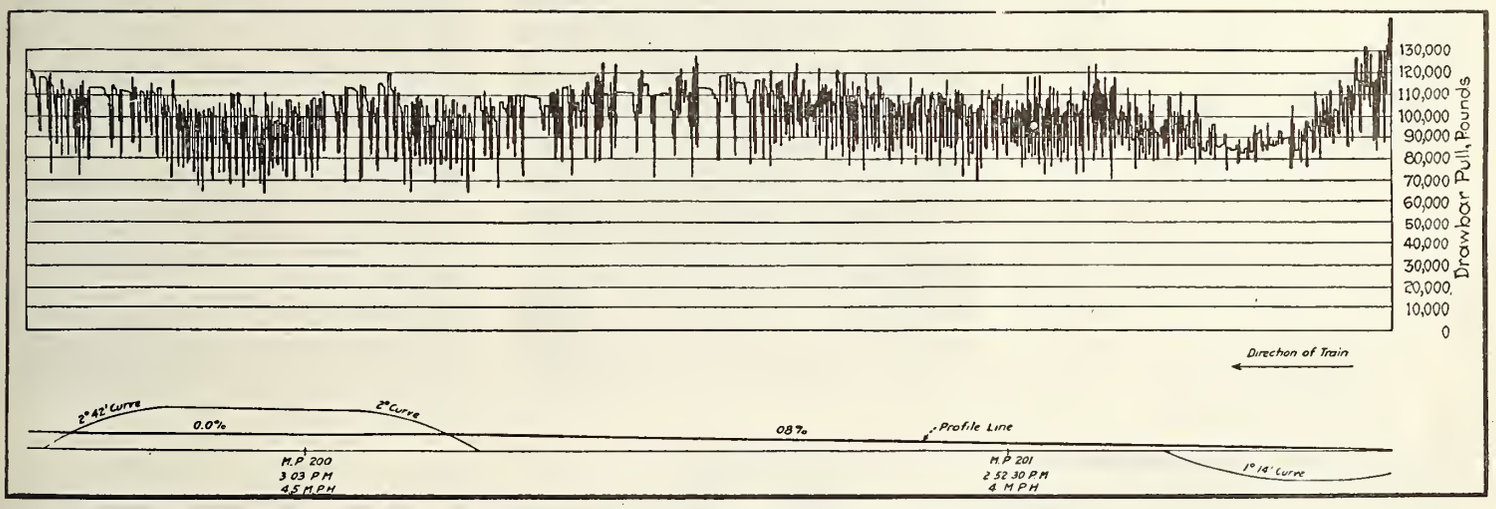
The World's Largest Locomotive Tested for Tractive Effort.

The big articulated locomotive of the Erie Rd., described in Canadian Railway and Marine World for September, pg. 404, was subjected to a hauling capacity test on the Susquehanna division recently. The test was made from Binghamton, N. Y., to Susquehanna, Penn., a distance of about 23 miles. The locomotive was at the head of a train of 250 fifty-ton steel gondolas loaded to full capacity, and a dynamometer car. The train weighed 17,912 tons, exclusive of the locomotive, which weighed about 422 tons, and the length of the train was 8,547 ft. The grade was practically level, the maximum being 0.09%, with 5° curvature.

Pushers were in readiness to assist in getting the train under way, and were used in making the start from Binghamton; but at Great Bend, where the locomotive took on water, pushers were not used in starting. They pushed the slack forward until the lead locomotive had all the cars moving, after which they were uncoupled and followed the train for emergencies. Communication was maintained between the head and rear of the train by portable telephones, which made it possible for the pushers to work efficiently with the lead engine at starting. The maximum drawbar pull is shown in the accompanying section of the dynamometer record. The following tabulation gives the main facts:

Number of cars in train	251
Total weight of train excluding locomotive	17,912 tons
Total length of train	1.6 miles
Maximum speed obtained	14 miles per hr.
Maximum drawbar pull	130,000 lb.
Minimum drawbar pull	67,000 lb.

The above data was furnished by R. S. Mounce, Engineering Department, Erie Rd., New York, N.Y.,—Engineering News.



Typical Section of Dynamometer Record of Hauling-Capacity Test.

E. Jacomb, Assistant Car Foreman, Michigan Central Rd., Windsor, Ont., writes: "Enclosed find $2 for my subscription for the current year to your valuable paper, Canadian Railway and Marine World. It is certainly worth the money."

Canadian Freight Association, Western Lines.

At the annual meeting in Winnipeg recently, officers and standing committees for the current year were elected as follows:—President, G. Stephen, G.F.A., Canadian Northern Ry.; Vice President, A. E. Rosevear, G.F.A., Grand Trunk Pacific Ry.; Executive Committee, W. C. Bowles, G. Stephen, and A. E. Rosevear.

Inspection Committee—W. G. Manders, G. H. Smith, F. R. Porter, P. H. Burnham.

Car Service Committee—A. Hatton, J. P. Driscoll, T. P. White, W. B. Harris.

Classification Committee—W. B Lanigan, G. Stephen, A. E. Rosevear, W. G. Manders, F. R. Porter, P. H. Burnham, W. C. Bowles.

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

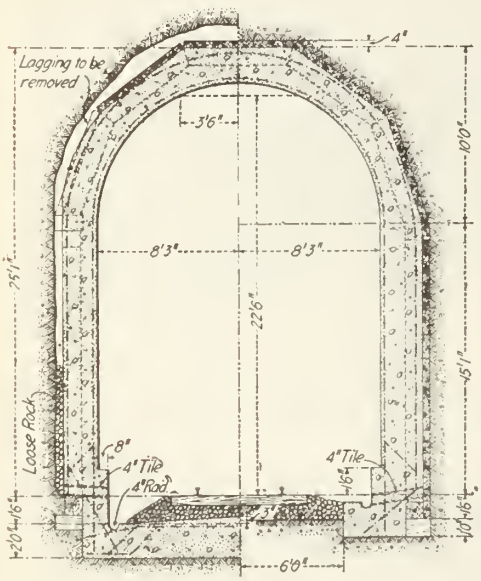
BEESON'S MARINE DIRECTORY of the Northwestern Lakes. 270 pages, 7 by 10 ins., cloth. Harvey C. Beeson, Chicago, Ill.

The 28th annual issue contains lists of all Canadian and United States vessels on the Great Lakes, with details of their equipment, engines, boilers, etc. Owing to the increase of the number of gas engined vessels in use on the lakes of recent years, a separate list has been prepared for these. Other information included in the book, covers hydrographic reports, marine associations, list of lumber vessels, representative grain elevators and vessels with illustrations and descriptions, and a great deal of interesting historical information concerning the Great Lakes. There is also included a history of the great storm of Nov. 8 to 11, 1913, with details of the various vessels wrecked and lost.

Fireproof Concrete Roofs in Locomotive Houses may be prevented from causing condensation on the under side, when the roof is flat, by placing a layer of cinders on the top of the slab roof, at the required roof slope, and covering this with a 1 in. layer of cement mortar as the base for the tar and gravel roofing, the cinder layer acting as an effective insulator. If the roof has a slope, a cinder fill is unnecessary, and a layer of hollow terra cotta tile, with the same concrete covering, answers the purposes. It is said that this latter type of roof covering will cost 12 cts. per sq. ft., as against 10 cts. per sq. ft. for the cinder filling one.

Lining Tunnels on the Grand Trunk Pacific Railway.

After the preliminary work of driving the G.T.P.R. tunnels in British Columbia had been completed in the rough and track laid so that construction and supply trains might pass on to the ever advancing railhead there yet remained a difficult and expensive part of the tunnel work. This was the trimming up of the tunnels and the placing of permanent lining. On the line

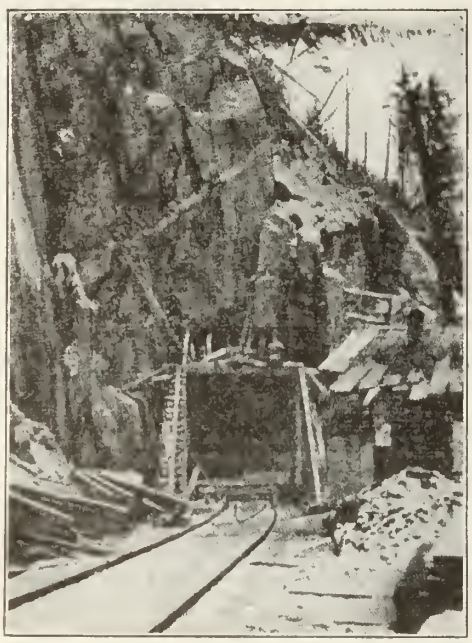


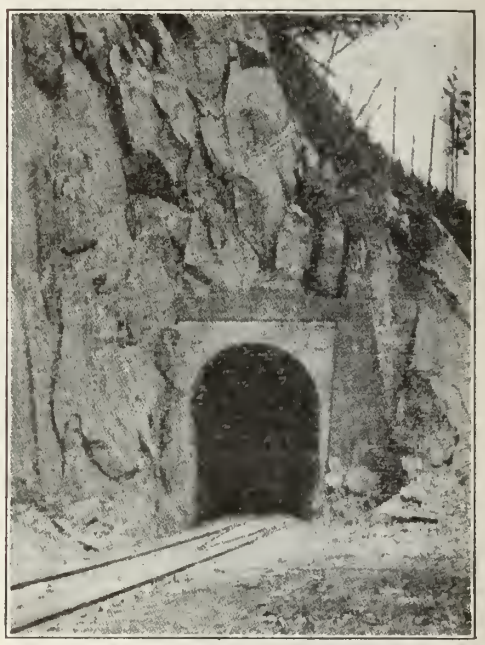
Typical Half Section of Tunnel Lining.

built eastward from Prince Rupert, B.C., this work was started in Sept., 1912, and was not completed until Feb., 1914. It involved practically the same problems and difficulties that were met in driving the tunnels in the first place, with the additional factor of keeping the track clear for the passage of trains. There are 11 tunnels in this section of the road, of which two (nos. 2 and 7) are in solid rock and required no lining. The remaining ones, which required to be lined with concrete, have a total length of about 6,500 ft.

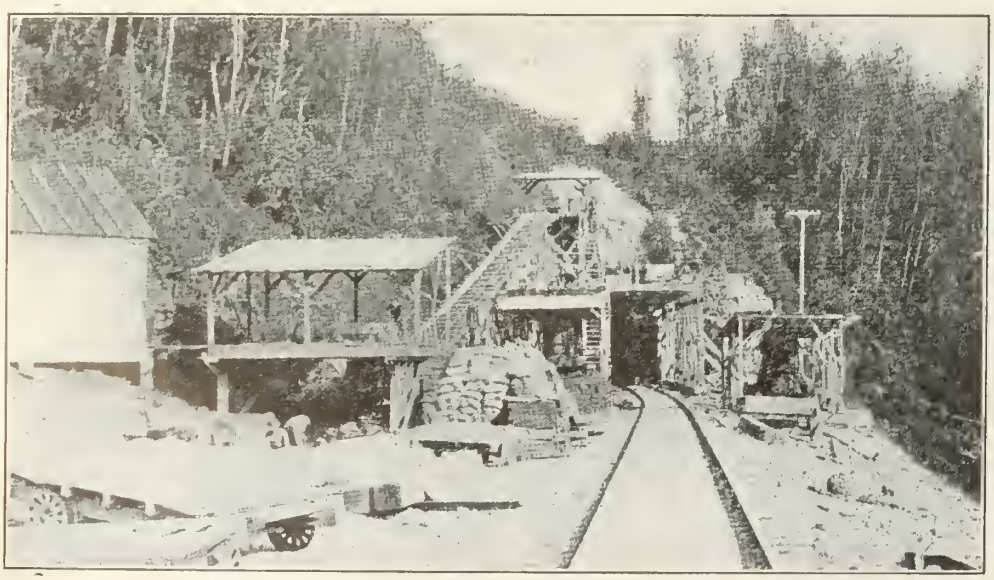
Tunnel 1, at mile 44 east of Prince Rupert, was driven for use as a snowshed during the winter, trains using the main line, which followed the contour of the hill outside, for eight or nine months. The roof of this tunnel was found to be about 4 ft. too low to allow the placing of the lining which was finally considered necessary; but since the track outside could be used for traffic while the tunnel work was under way no great construction difficulties were experienced. The downhill side of the tunnel interior was also widened down to a level about 4 ft. above the track where the rock was benched and was used as a foundation for timber and concrete. About 30 ft. of concrete lining were required in the badly broken rock at the west portal.

At mile 103.7 the main line enters a 920 ft. tunnel, about half of which is in solid rock, and required no lining. At its eastern end, however, the tunnel emerges in material which is extremely troublesome when wet. One of the accompanying views shows the condition of the portal during the work, where, after many slides, timber cribs were built to prevent the mud from flowing over the track. It was decided that long wing walls would be required at the portal, and to secure substantial support for these a pile foundation was put in and the concrete was placed under the protection of a coffer-dam. Although the soft material gave much trouble during construction, once the work was completed it is said to have proved satisfactory in every way. The view of the completed portal indicates the successful operation of the subdrainage system.





Tunnel 1, Before and After Completion of Lining.



Mixing Plant at West Portal of Tunnel 4.

The concrete plant at this portal was arranged to be operated by two double drum hoisting engines. One of these conveyed materials up an incline to bins over the concrete mixer, while the other handled cars loaded with concrete between the mixer and the desired point on the track. For use at this tunnel a temporary platform was fitted up on a standard flat car and provided with an incline leading up from track level. This was known as the "high car" and was moved from point to point in the tunnel, or drawn out for the passage of trains, by means of cables from the same stationary engine that operated the dump cars. When the dump cars had been charged at the mixers and conveyed to this "high car" at the point where work was in progress they were uncoupled and connected to a cable leading up the incline, operated by the engine as before. Thus the concrete was delivered at the desired point along the tunnel line on top of a platform high enough to allow it to be dumped into side wall forms or easily shoveled into the roof forms.

A typical plant for mixing concrete for tunnel lining is shown in the portal view of tunnel 4. This tunnel, at mile 104, is 550 ft. long, and the material traversed was so soft and broken that concrete lining was necessary throughout. Suitable space and materials for mixing concrete were found at the west portal, and the plant shown was therefore established there to supply the entire tunnel. Gravel was shoveled by hand into dump cars, shown at the left of the view, which served as measuring boxes, each holding just enough for a batch. The cars loaded with gravel were hauled up the incline as far as the cement shed, under which they stopped long enough to receive the cement charge on top of the gravel, and were then hauled to the platform, where they were dumped into the mixer hopper as desired. The engine on the left of the track operated cars on the incline, while the one on the right hauled the concrete cars in and out of the tunnel. These cars operating in the tunnel used tracks laid on the 12 by 12 in. timber framing

shown, which had to be erected throughout the length of the tunnel to support loose rock and prevent a cavein.

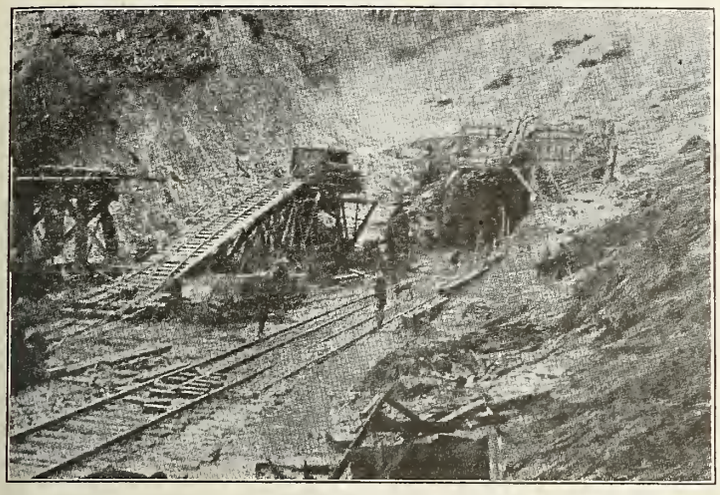
Perhaps the most difficult work on the line was in the 1,250 ft. tunnel at mile 104.5, which had to be timbered as fast as it was driven, for more than 1,000 ft. of its length. All this original timber lining had to be removed to allow the final trimming up of the bore and the placing of the concrete lining. This proved to be dangerous work, because there was much loose rock behind the timbers. In this tunnel there was no alternate route, and the track had to be kept clear for the passage of trains. The method adopted was first to put in 12 by 12 in. angle braces from the side wall posts to the tunnel floor just clear of the track. Excavation for permanent footings was then made, undermining the lower sills, while the angle braces carried the load. Concrete was then poured on foundations thus prepared and was left to harden with an offset for temporary timbering.

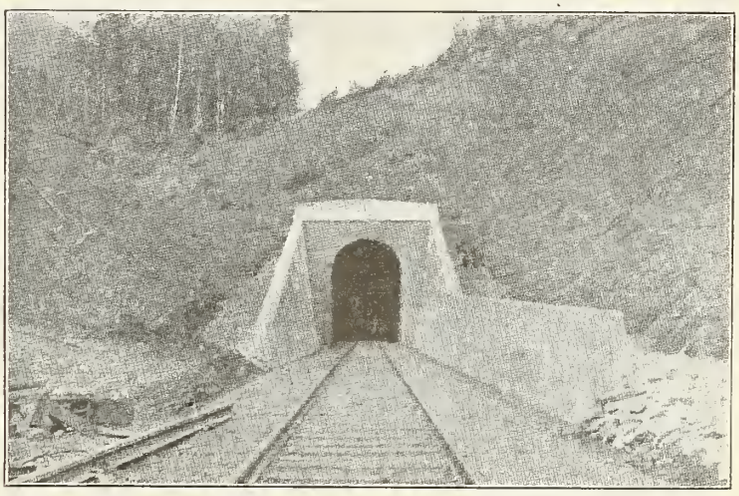
On the offset of the permanent footings temporary bents of 12 by 12 in. timbers were built, similar to those shown in the portal view of tunnel 4, these bents being of such size as to give sufficient clearance for trains and at the same time leave room for the lining forms. The roof timbers were then supported on these temporary bents, while original posts, sills and wall plates were removed, and the forms placed and filled up to the springing line of the arch. In some places the nature of the material was such that it was safe to remove the timbering and pour side wall sections as long as 48 ft. at a time, while in other parts of the tunnel the ground was so heavy that 4 ft. sections were as long as could be handled with safety. After the concrete walls had set the roof timbers were removed, a section at a time. The arch was concreted by a similar process. The roof sections gave more trouble than the walls, and the lengths deemed safe without timbering varied from 3 to 32 ft.

Concrete was handled in this tunnel by the use of a "high car" similar to that already described, except that here a short incline led from the "high car" platform to the top of the temporary bents, from which concrete was dumped into side walls or shoveled into roof forms.

The reinforcing in the concrete lining varied with the material traversed, but a typical case in gravel and clay was given a double row of ⅞ in. round bars placed on 6 in. centres and extending from the footing on one side over the arch to the footing on the opposite side. The horizontal bars were ⅝ in. in diameter and were placed on 5 ft. centres. Splices were required to have a 4 ft. lap and be firmly wrapped with wire. Where soil conditions required, the invert was floored with concrete, or concrete struts 4 ft. wide were placed on 12 ft. centres.

The trimming up and lining of tunnels 1, 3, 4, 5, 6 and 8 were under the supervision of F. R. Giertsen and that of tunnels 9, 10 and 11 under the supervision of G. C. Mulville, assistant engineers, G.T.P.R. R. J. Graham was Superintendent for the contractors, the Bates and Rogers Construction Co., Chicago.—Engineering Record.

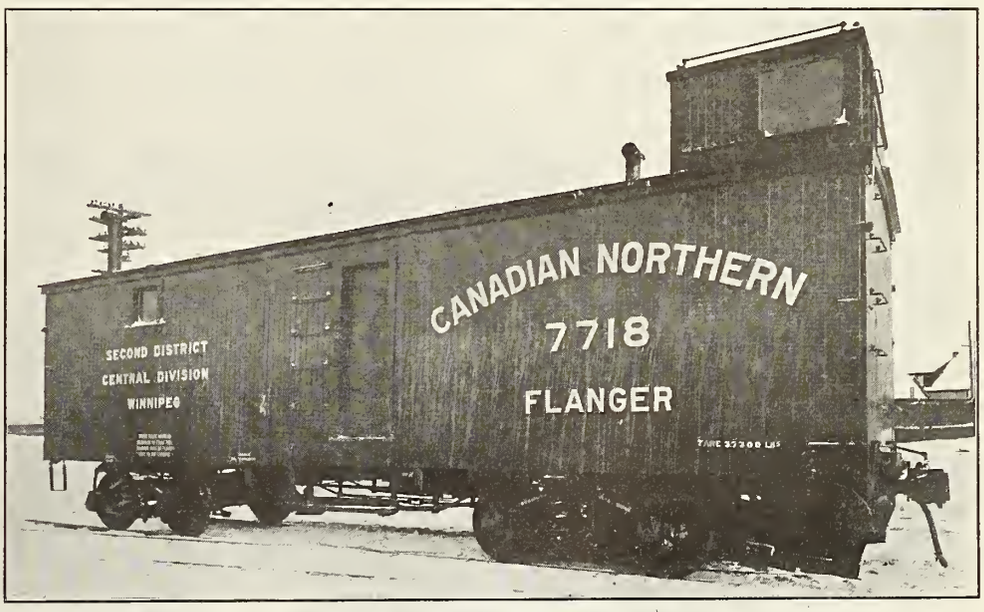




Portal of Tunnel 3 During and After Construction, Showing Troublesome Material Encountered.

Standard Flanger Car, Canadian Northern Railway.

The accompanying illustrations show the details of construction and the completed form of a new flanger car, adopted as a standard by the C.N.R. The design was developed in Winnipeg in the winter of 1912-13 as a result of experiments and study under actual service conditions, and so successful did it prove in service that last summer 11 were built there, which, during the last winter proved to be efficient and convenient.



Flanger Car on Canadian Northern Railway.

The requirements originally laid down for the design were as follows:—1. The car to be worked by one man. 2. Compressed air to be used for the operation of the apparatus. 3. The flanger to cut over the entire width of track out to the ends of the ties, and to any depth between the rails thought advisable. 4. The angle of the flanger plough to be such that snow and ice will be thrown clear even when running at moderate speeds. 5. The form of the flanger plough to be such that snow and ice will be thrown over a shoulder of moderate height and not rolled over the top of the plough. 6. The actual cutting blades to be so designed that when they strike any solid object, such as a guard rail or crossing plank, they will bend without damaging the plough or connections. 7. All parts of the apparatus to be of simple construction and as strong as possible.

The flanger apparatus is attached to the rear end of the car, just back of the rear truck. The car itself is, in design, very similar to a caboose. The flanger plough faces are of the shape indicated, mounted on a steel frame. At the rear this frame is suspended on either side by two 20 in. links. At the front it is supported from the 20 in. arm of a bell crank, the other arm of which passes up through the car floor. This bell crank is pivotted in bearings fastened to wooden members attached to the under side of the centre sill ends. Movement of

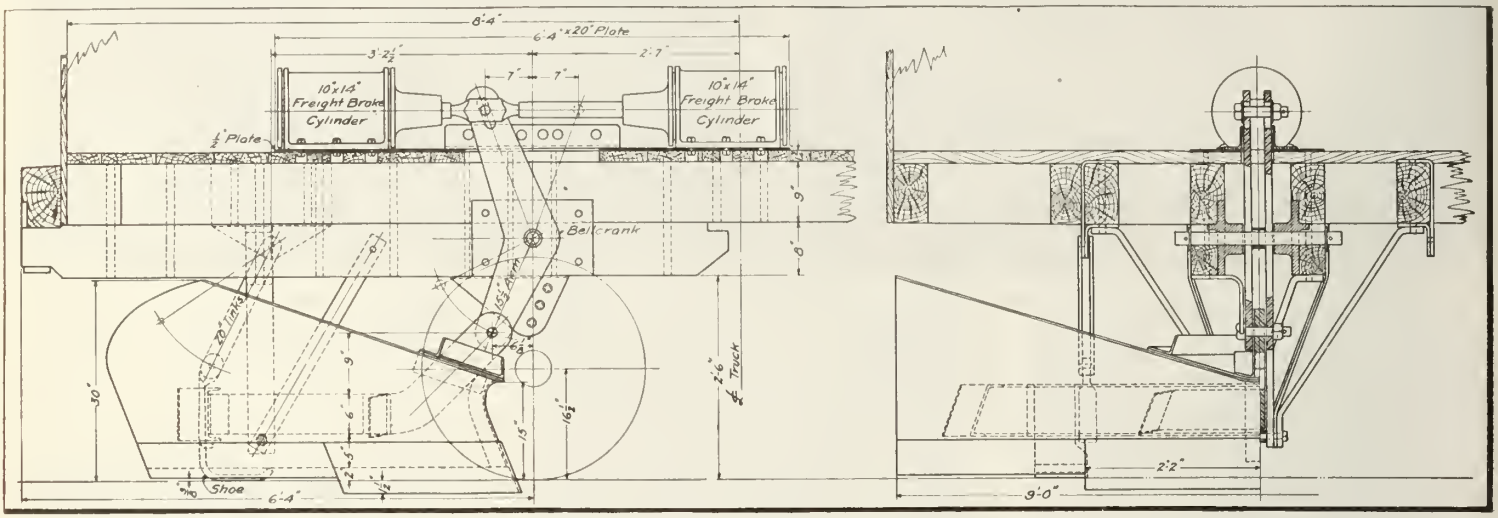
the bell crank causes the plough to swing in a horizontal plane from the front and rear link supports. The under side of the plough has a shoe on each side directly over the rail, so that when let down it rides the rails on either side. The movement is given to the bell crank lever by means of two opposed cylinders on the floor of the car, a pin through the plunger rod connecting the two, engaging slots in the double levers of the bell crank. These opposed cylinders are supported on a steel plate on the car floor.

Motors on the Canadian Pacific Railway Laggan-Lake Louise Line.

Four motor cars were built in 1912 at the C.P.R. Angus shops, Montreal, for the short run from the main line at Laggan, Alta., to the company's hotel at Lake Louise, a 3½ ft. gauge line having been built for the intervening 4 miles. These cars were placed in service that summer, and after some slight remodelling, were used again last season, and have proved most satisfactory. They are illustrated herewith. Two were built for passenger service exclusively, and the other two for the handling of freight and baggage between the main line and the hotel.

All the cars are identical in design with the exception of the bodies, which for the passenger cars are merely applied in place of the flat platform of the freight cars. The passenger car bodies resemble to a degree the construction of the usual type of open street car. The body length is 24 ft. 9½ ft. 9 ins. The step arrangement on both freight and passenger cars is identical.

Each passenger car has 7 cross seats at 2¾ ft. centres, which will hold 5, giving a total seating capacity of 35, exclusive of the motorman's accommodation. The sides of the car are made of sheet steel, with brass grab handles. The seats are of rattan, of a similar type to that used in the company's standard tourist cars, except that they ex-



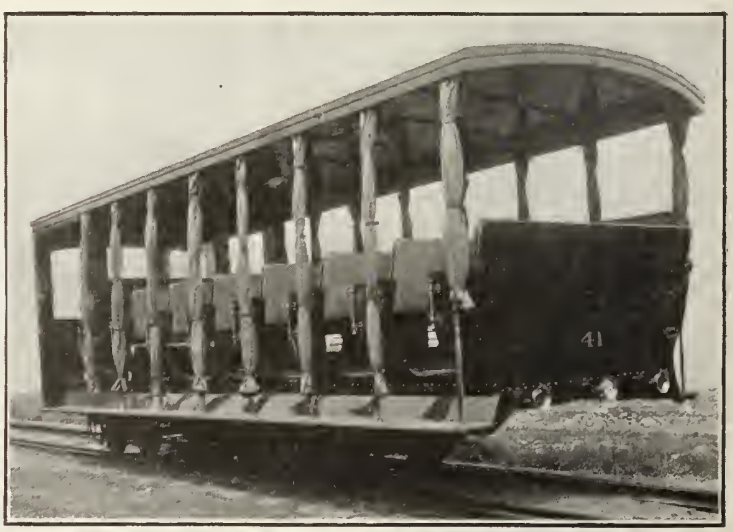
Detail of Flanger Plough on Canadian Northern Railway Flanger Car.

A small cupola is provided on top of the car, directly over the plough end, to accommodate the operator. This cupola has slide windows on each side, as well as front and back, and the operator has a seat similar to that used in a locomotive, and which is mounted near the right hand slide window. Immediately in front of the operator is a four way air cock, by which the movements of the flanger are controlled mechanically.

tend the width of the car, without the central aisle. The roof of the car is of a modified type of monitor roof, almost flat.

The main frame consists of two 8 in. channels, 3 ft. 0¾ in. back to back at the front, widening out under the body of the car to a width of 4 ft. 4½ ins. back to back of the channels. This frame is cross braced by channels, and a built up front body bolster. Outside the main frame, which does not extend the full length of the car body,

Freight Motor Car for C.P.R. Laggan-Lake Louise Line.



Passenger Motor Car for C.P.R. Laggan-Lake Louise Line.

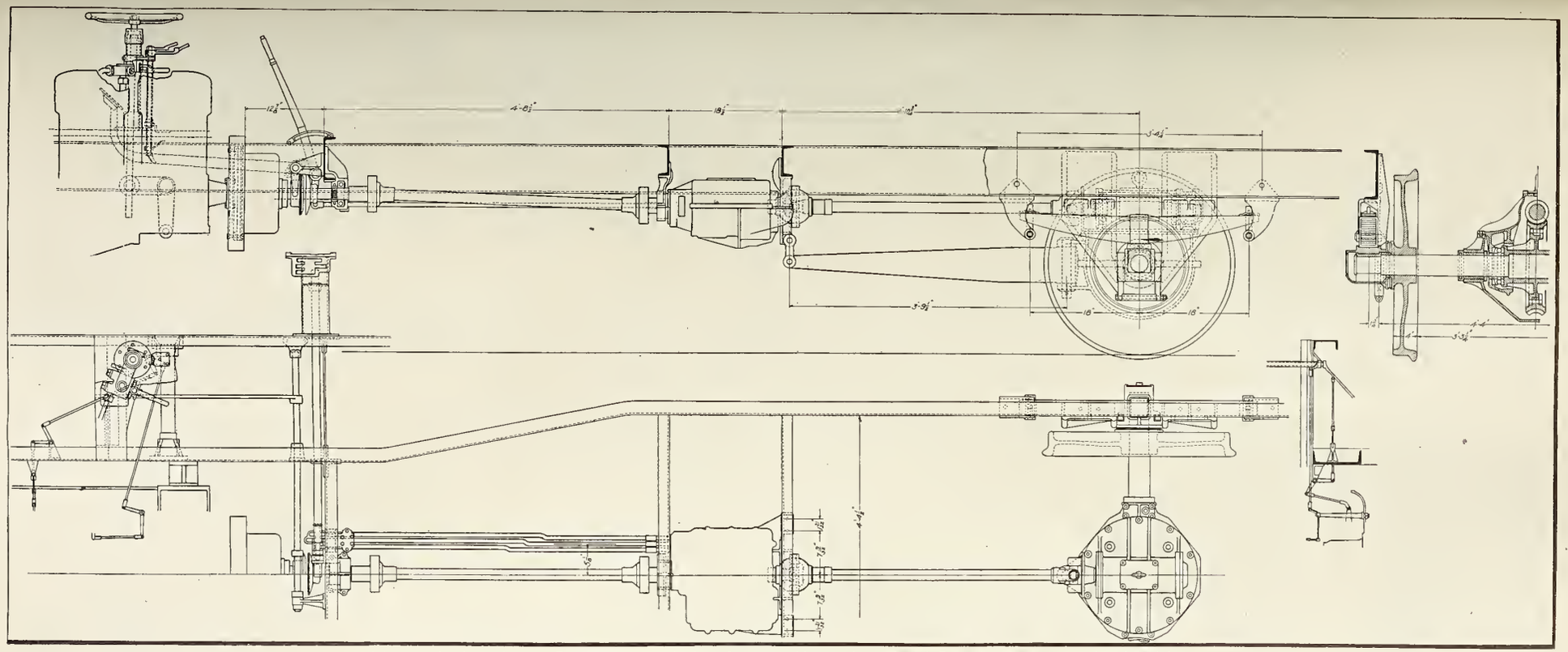
The interior of the car is provided with suitable living accommodation for the operator, and in addition a small bed room has been arranged for the roadmaster when he travels on the car.

We are indebted to S. J. Hungerford, Superintendent of Rolling Stock, C.N.R., for the data from which this article has been compiled. He states that, in his opinion, this design represents about the best development of flanger cars up to the present time.

ins. The floor level of both kinds of cars is 3 ft. above rail level, reached by an intermediary step from the station platform, this step being 22½ ins. above the rail level. The motorman's cab in both types of cars is the same, and the cab, as well as the passenger car body roof, is 6 ft. 10½ ins. above the car floor level, giving an over all height of the car of 9 ft. 10½ ins. The car body width is 7 ft. 10 ins., sloping inward near the bottom for the car steps, which have an outside over all width of 8

there is another pair of channels, 4 ins. deep, extending the full length of the car body, flanges inward, 6½ ft. back to back.

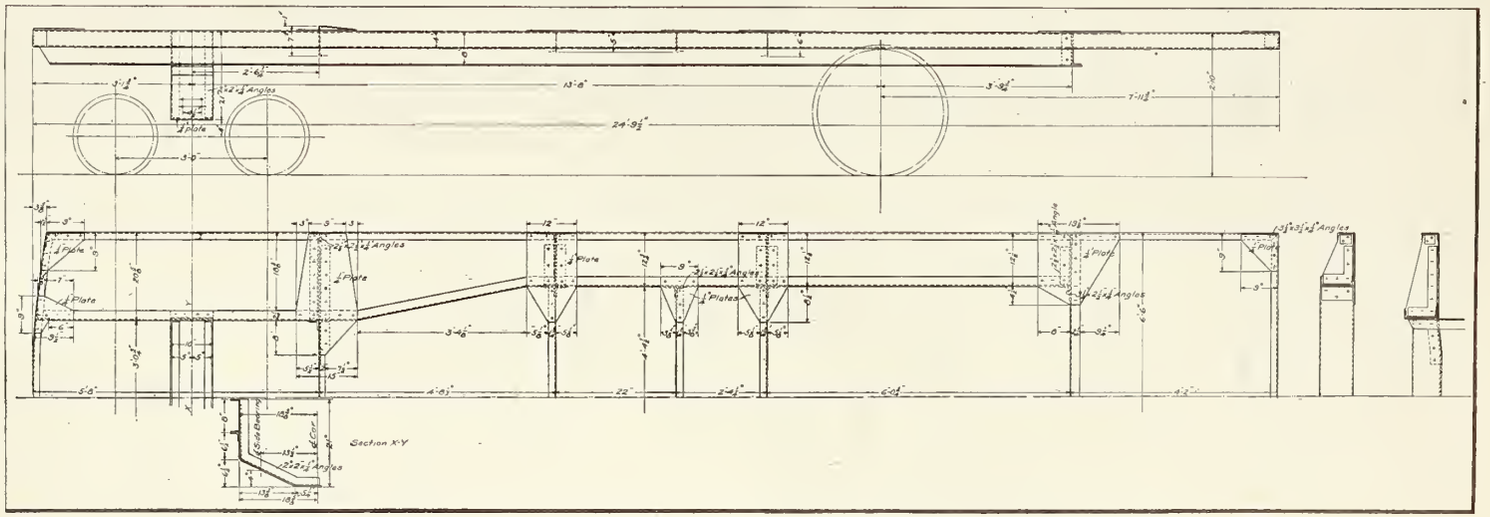
The cars are carried on a pair of driving wheels nearly midway under the body, and on a four wheeled truck under the front part of the car, this latter being pivotted on the built up body bolster mentioned. This truck has two pairs of 18 in. wheels at 3 ft. centres. The drivers, which are 13 ft. 8 ins. centres from the front truck, are mounted in pedestals secured to the underside of the



Plan and Elevation of Power Transmission Gear on Motor Cars for C.P.R. Laggan-Lake Louise Line.

8 in. main frame channels, the frame weight being carried to it through suspended leaf springs. The driving wheels are 30 ins. diameter.

The power and drive arrangement is almost identical with that of the majority of 6 cylinder touring automobiles. As originally built, each of the four cars had a 60 h.p. 6 cylinder Alco motor, but in the subsequent slight remodelling, these motors in the passenger cars were replaced with 66 h.p. 6 cylinder Pierce-Arrow motors, for which it was necessary to change the end arrangement of the cars slightly by lengthening it to take in the longer motor. The motors are carried between the narrowed front portion of the front main frame channels, with the tops projecting up into a protecting hood in the centre of the motorman's cab. The drive is through a central shaft to a change gear box nearly midway between the engines and the driving axle. On this driving axle there is a worm gear, engaging a worm on the driving shaft, the portion of the latter between the change gear box and the worm box having two universal joints to compensate for the vertical movement in the driving axle. The worm box arrangement differs somewhat from that in an automobile, as no differentials are required, the curves negotiated being such as not to require this added feature. The worm box is carried directly on the driving axle, with an equalizing fulcrum from it to the change gear box, which is supported from the underside of two of the cross bracing channels. Next to the engines there is the clutch, supported from the underside of the cross bracing channel at that point.



Plan and Elevation of Underframing on Motor Cars for C.P.R. Laggan-Lake Louise Line.

The motorman's control is similar to that in an automobile, the principal difference being that the usual steering wheel of the automobile is used for the hand brake, the ordinary braking being by air from drums suspended under the car carrying air at 150

lbs., which is reduced to 50 lbs., for application. The air control lever is under the main wheel on the wheel standard. Adjoining it are the control levers for the spark and throttle, with the clutch operated by a lever under the foot of the motorman. The change gears are operated in the usual automobile manner from a box attached to the outside of the frame, conveniently located within the motorman's reach, the control rods from this shaft paralleling the drive shaft. The motor is started in the usual manner, by cranking in front.

The front of the cab carries a Livingstone radiator, all the cars having been changed to this type from the original McCord radiators. Above the radiator there is a headlight, and at the back, tail lights, which, in conjunction with the interior ceiling lights, are all operated by electricity from storage batteries.

These cars are capable of making 15 miles an hour, and can negotiate grades up to 4%. We are indebted to W. H. Winterrowd, Mechanical Engineer, C.P.R., for the information on which this article is based.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

22357. Aug. 5.—Dismissing application of Welland County, Ont., requiring Toronto, Hamilton and Buffalo Ry. to divert certain highways in Pelham Tp.

22358. Aug. 6.—Authorizing Medicine Hat Southern Ry. to build across C.P.R., overhead, near Medicine Hat, Alta.

22359. Aug. 10.—Approving C.N. Quebec Ry. clearances at Canada Cement Co.'s plant no. 1, Montreal.

22360. July 28.—Authorizing St. John and Quebec Ry. to cross C.P.R. at three points in Fredericton, N.B., interlocking plants to be provided.

22361. Aug. 8.—Authorizing Nakusp and Slocan Ry. to build spur for Lucky Jim Zinc Mines, Lot 611, Group 1, West Kootenay District, B.C.

22362. Aug. 10.—Approving Bell Telephone Co. agreement with North Gosfield Tp., Ont., for interchange of business.

22363. Aug. 10.—Authorizing C.P.R. to use certain bridges on its Cascade Subdivision, B.C.

22364. Aug. 11.—Authorizing C.P.R. to close portion of road allowance between Secs. 14 and 23, Tp. 17-24, w.p.m.; to build road diversion in Sec. 23; and build at grade its main line across highway between Secs. 22 and 23, at mileage 41, Bredenbury Subdivision, Man.

22365. Aug. 11.—Extending to Oct. 14, time for completion of spurs for Canadian Kodak Co., Lot 1, Con. 4, west of Yonge St., York Tp., Ont.

22366. Aug. 11.—Relieving C.P.R. of speed limitation of 15 miles an hour over its Suffield-Blackie Branch from mileage 26.3 to 57.2, and authorizing it to open for traffic portion of that branch from mileage 57.2 to end of track, mileage 84, Alberta.

22367. Aug. 11.—Authorizing C.P.R. to build siding for Modern Joint of Montreal, Ltd., Montreal.

22368. Aug. 11.—Authorizing G.T. Pacific Ry. to build bridge across Endako River at mileage 340.9, Prince Rupert East, B.C.

22369. Aug. 10.—Declaring that G.T.R. Tariff, C.R.C. 2457, applies to and includes traffic offered to it by C.N. Ontario Rv. for delivery on team tracks at Toronto, and G.T.R. will accept C.N.R. carload traffic.

22370. Aug. 10.—Approving of plan and specification of E. A. Silcox for award drain under G.T.R. in Southwold Tp., Elgin County, Ont.

22371. Aug. 7.—Authorizing C.P.R. to build spur for Constructing and Paving Co., Toronto.

22372. Aug. 10.—Authorizing C.P.R. to open for traffic portion of double track diversion between Percival and mileage 120, Sask.

22373. Aug. 12.—Amending order 21448, Mar. 6, re building of C.P.R. Swift Current northeasterly branch across highway at mileage 98.47, Sask.

22374. Aug. 10.—Ordering tolls of express companies to include collection and delivery in certain thoroughfares reasonably passable for express waggons in Regina, Sask.

22375. Aug. 13.—Authorizing C.P.R. to extend siding for Vaughan Sand and Gravel Co., Toronto.

22376. Aug. 12.—Amending order 22062, June 25, re C.P.R. overhead bridge at George St. Smiths Falls, Ont., by striking out words "less the contribution already made for overhead bridge there."

22377. Aug. 12.—Authorizing C.P.R. to open portion of its Weyburn westerly branch from Shaunavon to Gowanlock, mileage 230.8 to 307.3; speed of trains limited to 18 miles an hour.

22378. Aug. 12.—Authorizing C.P.R. to build revised location of City of Moose Jaw's Power House spur from North Bridge St. to city's premises.

22379. Aug. 13.—Extending time within which C.P.R. shall complete spur for Renfrew White Granite Co., Renfrew, Ont.

22380. Aug. 13.—Amending order 22157, July 7, by striking out words and figures "as no. 255."

22381. Aug. 13.—Authorizing C.P.R. to build three tracks at grade across Nelson St., Vancouver, B.C.

22382. Aug. 14.—Amending order 20807, Nov. 13, 1913, re diversion of road across C.P.R. in s.w. ¼ Sec. 32-18-14, w. 4 m., Alta.

22383. Aug. 12.—Relieving G.T.R. from providing further protection at crossing of Brewster Ave., Lachine, Que.

22384. Aug. 12.—Authorizing G.T. Pacific Ry. to carry traffic over portion of its line from Prince George to Priestley, B.C., at a maximum speed of 25 miles an hour; but not exceeding 10 miles an hour at steel bridges under construction or where slides have occurred about mileages 417, 418 and 443 east of Prince Rupert.

22385. Aug. 13.—Authorizing G.T. Pacific Ry. to increase speed of trains from 15 to 25 miles an hour between Knockholt and Priestley, B.C.

22386. Aug. 13.—Authorizing G.T.R. within 60 days to install improved type of automatic bell at crossing of highway at Lot 16, Con. 9, Perry Tp., Ont.

22387. Aug. 12.—Approving revised location of C.N. Ontario Ry. from station 2065+68.6 to 2156+81.4, mileage 85.13 to 86.85 from Ottawa, Ont.

22388. Aug. 14.—Authorizing C.P.R. to build extension to siding for Rocsand Co., Ltd., Erin, Ont.

22389. Aug. 13.—Extending to Oct. 1, time within which C.P.R. shall install bell at crossing of main approach to Hospital for Insane, London, Ont.

22390. Aug. 14.—Authorizing C.P.R. to build branch for Forest Mills of British Columbia, Revelstoke, B.C.

22391. Aug. 14.—Authorizing C.P.R. to operate over certain bridges in Manitoba and Saskatchewan.

22392. Aug. 18.—Ordering G.T.R. to provide suitable siding where its railway intersects lands of Hamilton and Toronto Sewer Pipe Co., West Flamboro Tp., Ont., to be completed within three months from time of deposit of $5,000.

22393. Aug. 13.—Authorizing Cedar Rapids Manufacturing and Power Co., Montreal, to take certain land for transmission line right of way in Soulanges County.

22394. Aug. 11.—Authorizing C.P.R. to build extension to siding for Lombard Bros. & Marshall, Marston Tp., Que.

22395. Aug. 11.—Authorizing C.P.R. to build sidings for Dominion Bridge Co. in St. John, N.B.

22396 to 22398. Aug. 15.—Approving C.P.R. clearances at siding on National Brick Co.'s premises; W. F. Villa's siding, Dunham Tp., Que.; and E. & T. Fairbanks' siding, Sherbrooke, Que.

22399. Aug. 14.—Refusing Canadian Northern Ry.'s request to put station grounds at Dunrobin, Ont., at mileage 23.6 from Ottawa, on its Ottawa-Capreol line, in lieu of at mileage 22.

22400. Aug. 10.—Dismissing Canadian Northern Ry.'s application for revised location through Tp. 40-26 w. 4 m., and part of Lacombe, Alta., mileage 1.94 to 4.03; and for authority to close and divert Milner and Brooks Sts., and to build across roadway south of Block H, to be opened in lieu of said two streets.

22401. Aug. 17.—Authorizing Toronto Harbor Commissioners to build footbridge over G.T.R. to Parkdale Canoe Club.

22402. Aug. 18.—Ordering C.P.R. to add to fencing of right of way between Coldwater and Orillia, Ont., to stop animals from passing through.

22403. Aug. 18.—Authorizing C.P.R. to close station at Manvers, Ont., same to be maintained as flag station.

22404. Aug. 17.—Approving C.P.R. main line between mileage 72.50 and 74.75, Cascade Subdivision; and revised location of said portion at mileage 74.0.

22405. Aug. 17.—Authorizing C.P.R. to build spur for Canadian Marble and Granite Works, Ltd., Nelson, B.C.

22406. Aug. 18.—Ordering G.T.R. within 60 days to install improved automatic bell at public highway near St. Paul's Station, Ont.

22407. Aug. 18.—Approving location of Van Buren Bridge Co.'s railway from International Ry. in St. Leonard, N.B., to International boundary, one mile.

22408. Aug. 18.—Amending order 21881, May 26, which authorized Montreal and Southern Counties Ry. to build across 4 highways in St. Cesaire, Que.

22409. Aug. 18.—Ordering G.T.R. to build cattle pass under railway on F. H. Lewis' farm, near Burford, Ont.

22410. Aug. 19.—Ordering Canadian Northern Ry. to build private crossing in line with Second St., Paynton, Sask., and to acquire land to open up and grade highway south from Government road allowance to connect with Second St.

22411. Aug. 14.—Authorizing Spy Hill rural municipality no. 152, Saskatchewan, to build highway crossing over C.P.R. where extension of Main St. to Tantallon townsite crosses tracks in s.w ¼ Sec. 16, Tp. 18, R. 32, w. 1 m.

22412. Aug. 17.—Approving C.P.R. Standard Freight Tariff, C.R.C. no. W 1948, effective Sept. 1, to apply between stations and ports of call in Ontario, west of and including Port Arthur; Manitoba, Saskatchewan, Alberta and British Columbia.

22413. Aug. 21.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to connect with Thurlow Ry. in Lot 22, Con. 1, Thurlow Tp., Ont., at mileage 72.36 from Glen Tay.

22414. Aug. 17.—Approving C.P.R. clearances at the Contractors' Supply Co.'s sidings at mileage 20, Owen Sound Subdivision, Ont.

22415. July 31.—Authorizing Erie and Ontario Ry. to build across St. Catharines Road, South Grimsby Tp., Ont., by subway carrying highway under railway.

22416. Aug. 21.—Authorizing Van Buren Bridge Co. to build railway at grade across public highway in St. Leonard Parish, N.B., from St. Leonard to Edmunston.

22417. Aug. 21.—Authorizing C.P.R. to build siding for Warner Quinlan Asphalt Co., Montreal.

22418. Aug. 20.—Authorizing C.P.R. to extend spur on Queen St., Port Arthur, Ont., across High St. and John St. and along Johnson Ave., also to cross Port Arthur Electric Ry. on Algoma St.

22419. Aug. 20.—Approving Dominion Ex. Co.'s Tariff C.R.C. 4439 between points on Vancouver Island, B.C.

22420. Aug. 21.—Approving plan and specifications of Gordon Award Drain under G.T.R., Atwood, Ont.

22421. Aug. 20.—Ordering C.P.R. to build highway crossing over its Soo Branch near mileage 96.5, two miles west of Bruce station, Ont.

22422. Aug. 21.—Authorizing Van Buren Bridge Co. to connect with International Ry. of New Brunswick, in St. Leonard Parish.

22423. Aug. 20.—Authorizing City of Prince Rupert, B.C., to build crossing over G.T. Pacific Ry. at boundary waterfront, Lots D and E, by overhead bridge; provided if additional trackage is necessary the city shall extend bridge.

22424. Aug. 21.—Authorizing Erie and Ontario Ry. to build across certain highways in Moulton, Gainsboro and Wainfleet Tps., Ont.

22425. July 22.—Authorizing Michigan Central Rd. to build spur for Dominion Chain Co., Niagara Falls, Ont.

22426. Aug. 22.—Authorizing Van Buren Bridge Co. to connect its line with, and to cross at grade, the National Transcontinental Ry.

22427. Aug. 22.—Ordering Campbellford, Lake Ontario and Western Ry. (C.P.R.) to build flag station and platform, with spur track to hold eight cars, at Parham, Ont.

22428. Aug. 24.—Ordering that general order 124, Apr. 30, be amended to provide that signal to be given by steamboat to have swing opened on Canadian Canal at Sault Ste. Marie, Ont., be three long followed by two short blasts.

22429. Aug. 24.—Ordering G.T.R. to build a 7½% grade on hill below its crossing at Goldstone Station, Ont.

22430. Aug. 24.—Authorizing that Canadian Northern Ry. station at Ethelbert, Man., be moved to just north of the north switch.

22431. Aug. 25.—Authorizing St. John and Quebec Ry. to build across C.P.R. at or near mileage 20, Fredericton Branch, Fredericton, N.B.

22432. Aug. 24.—Ordering C.P.R. to build spur for E. M. Zentil, Dryden, Ont.

22433. Aug. 21.—Authorizing Toronto Eastern Ry. and Oshawa Electric Ry. to operate over O. E. R. crossing at Simcoe St., Oshawa, Ont., for six months from Aug. 6.

22434. Aug. 24.—Authorizing Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co. (Canadian Northern Ry.) to operate temporarily over the connection and interchange track at Regina, Sask.

22435. Aug. 24.—Approving G. T. Pacific Ry. station site and station at Evelyn, mileage 217.3, Prince Rupert East, B.C.

22436. Aug. 24.—Approving plan, dated Montreal, July 11, 1907, showing protection work proposed to be built for bridge across the Kaministikwia River at Fort William, Ont.

22437. Aug. 24.—Authorizing G. T. Pacific Ry. to carry traffic over portion of its line between Prince George and Priestley, B.C.; speed of trains limited to 25 miles an hour, with exception of portions at steel bridges under construction and near mileages 417, 418 and 443, where slides have occurred, when speed is limited to 10 miles an hour.

22438. Aug. 26.—Authorizing G.T.R. to build siding for B. Blair Co., Woodstock, Ont.

22439. Aug. 25.—Authorizing G. T. Pacific Ry. to build spur for Terrace Saw Mill, Doast District, B.C.

22440. Aug. 26.—Authorizing G.T.R. to build branch line for S. L. Wright, Etobicoke, Ont.

22441. Aug. 24.—Authorizing G. T. Pacific Branch Lines Co. to connect with Regina Municipal Ry. and build interchange track in 5th Ave., Regina, Sask.

22442. Aug. 22.—Relieving C.P.R. from providing further protection at crossing one mile west of Fassett station, Que.

22443. Aug. 22.—Authorizing C.P.R. to use bridge 32.4, Brandon Subdivision, Man.

22444. Aug. 26.—Authorizing C.P.R. to open for traffic one track of double track diversion between Whitewood and mileage 119.0, Broadview Subdivision, Sask.

22445. Aug. 24.—Approving C.P.R. clearances at Cochrane's Hardware Ltd. siding, Sudbury, Ont.

22446. Aug. 25.—Authorizing C.P.R. to build 9 grade crossings on its Weyburn-Stirling Branch, between mileage 259.23 and 276.35, Sask.

22447. Aug. 25.—Amending order 22310, July 31, by substituting 21679 for 21879 in recital part.

22448. Aug. 22.—Authorizing C.P.R. to build branch for City of Calgary from main line across Block D, to city's premises.

22449. Aug. 21.—Authorizing Trafalgar Tp., Ont., to build Morden Road, across Hamilton Radial Electric Ry.

22450. Aug. 25.—Amending order 22250, July 22, re C. P. R. siding for Shawinigan Water and Power Co., Montreal.

22451. Aug. 27.—Authorizing Erie and Ontario Ry. to build branch in Con. 2, Moulton Tp., from station 493+29.8, through Lots 18 and 17, to Michigan Central Rd.

22452. Aug. 27.—Approving plan of interlocking plant installed at Canadian Northern Ry. crossing of C. P. R., Stobie Branch, on Lot 4, Con. 5, McKim Tp., Ont.

22453. Aug. 26.—Authorizing Toronto Eastern Ry. to operate for construction purposes only, crossing of G. T. R. Port Perry Branch at Whitby, Ont.

22454. Aug. 14.—Ordering Dominion Transportation Co. to continue use and maintenance of railway wharf facilities at Michipicoten, Ont., to accommodate traffic.

22455. Aug. 19.—Authorizing Algoma Central and Hudson Bay Ry. to operate plant and swing bridge at Little Current, between Goat and Manitoulin Islands, Ont., without first stopping trains.

22456. Aug. 17.—Approving Supplement 6 to Express Classification for Canada 3.

22457. Aug. 11.—Ordering C. P. R. to stop its train 3 on flag signal, at Murillo, Ont., and giving liberty to cancel present arrangement of stopping nos. 7 and 1 there.

22458. Aug. 28.—Authorizing G. T. R. within 60 days, to install improved type of automatic bell at crossing 1¼ miles east of Burlington Jct., Ont.

22459. Aug. 28.—Authorizing C. P. R. to build extension to siding for Brunelle and Besner, Vaudreuil, Que.

22460. Aug. 28.—Authorizing C. P. R. to rebuild bridge 42.2 over Moose River, near Acton, Que.

22461. Aug. 19.—Approving C. P. R. clearances at stone crusher on Harrison and Beatty's Siding, Sydenham Tp., Ont.

22462. Aug. 28.—Authorizing C. P. R. to build private car siding and a freight wharf siding across Gordon St. and road allowance unopened in Bala, Ont., and a siding for H. Weismiller, in Medora Tp., Ont.

22463. Aug. 28.—Amending order 20117, Aug. 16, 1913, re Canadian Northern Ry. crossing of Manitoba and Saskatchewan Coal Co.'s spur in s. e. ¼ Sec. 19, Tp. 2, R. 6, w. 2 m., Sask.

22464. Aug. 31.—Amending order 22225, July 18, substituting Calgary Water Power Co., for Calgary Power Co.

22465. Aug. 29.—Authorizing Esquimalt and Nanaimo Ry. to provide level highway crossing at Alder St., Riverside Townsite, Cowichan Lake, B. C., at expense of British Columbia Public Works Department.

22466. Aug. 27.—Authorizing Erie and Ontario Ry. to cross G. T. R. at grade in Dunnville, Ont.

22467. Aug. 29.—Authorizing Erie and Ontario Ry. to build bridge across Twenty Mile Creek, South Grimsby Tp., Ont.

22468. Aug. 24.—Ordering C. P. R. to acquire land necessary for diversion involved in making roadway required by order 21821, May 11, and pay cost of construction and grading the additional 1,350 ft., remainder of cost to be paid by Brokenshell rural municipality no. 68.

22469. Aug. 29.—Authorizing St. John and Quebec Ry. to cross C. P. R. at Regent St., at Salamanca, and at 2 other points, in Fredericton, N. B.

22470. Aug. 29.—Authorizing C. P. R. to build extension on Hardisty St., at intersection of Leith St., Fort William, Ont.

22471. Aug. 29.—Authorizing Van Buren Bridge Co. to build bridge over St. John River from Van Buren, Me., to St. Leonard, N. B.

22472. Sept. 1.—Approving location of C. N. Ontario Ry. station grounds at Cushing, Que., mileage 6.60 from Hawkesbury, Ont., and rescinding order 15673, Dec. 22, 1911, approving location about a mile east.

22473. Aug. 31.—Authorizing G. T. R. to build branch for Chatham Bridge Co., Raleigh Tp., Ont.

22474. Aug. 31.—Approving G. T. Pacific Ry. standard freight mileage tariff, C. R. C. 22, between its stations in Ontario, Manitoba, Saskatchewan and British Columbia.

22475, 22476. Aug. 31, Sept. 1.—Authorizing C. P. R. to build spurs for Ross-Saskatoon Lumber Co., East Kootenay District, B. C., and Maple Leaf Milling Co., Medicine Hat, Alta.

22477. Aug. 29.—Rescinding plan F-14-15|3A showing standard fence proposed to be used by C. P. R. at highway crossings.

22478. Sept. 1.—Approving plans and specifications of proposed drainage works across track and lands of Canadian Northern Ry. in Sec. 15-13-10, w.2. m., Sask.

22479. Aug. 31.—Authorizing Glengarry and Stormont Ry. (C. P. R.) to build at grade across 16 highways in Lancaster and Charlottenburg Tps., Ont.

22480. Sept. 1.—Authorizing Michigan Central Rd. to take off its local train 109 between Comber and Essex, Ont.

22481. Aug. 31.—Authorizing Erie and Ontario Ry. to build pile trestle across Oswego Creek, Moulton Tp., mileage 8.45 from Smithville, Ont.

22482. Aug. 31.—Approving agreement between Bell Telephone Co. and Waterloo Tp., Ont.

22483 to 22485. Sept. 1.—Authorizing Hydro-Electric Power Commission of Ontario to erect line across G. T. R. at McCabe St., Welland, Lot 2, Con. 1, East Flamboro Tp., and across C. P. R. at Don Mills Rd., Donlands, Ont.

22486. Sept. 1.—Approving agreement between Bell Telephone Co. and Muskoka, Victoria and Haliburton Telephone Co.

22487. Sept. 2.—Authorizing Saskatchewan Government to build highway crossing over Canadian Northern Ry. on centre line of Sec. 22, Tp. 6, R 4, w.2.m., running north and south.

22488. Sept. 2.—Authorizing C. N. Ontario Ry. to build revision of its two tracks across public road at Sydenham, Lot 1, Blocks Q and R, Con. 5, Loughboro Tp.

22489. Sept. 2.—Authorizing Glengarry and Stormont Ry. (C. P. R.) to build bridges 4.99, 16.41, 17.47.

22490. Sept. 4.—Approving Great Northern Ry. standard tariffs C.R.C. 1057 to 1063.

22491. Sept. 8.—Approving deviation of Glengarry and Stormont Ry. (C.P.R.) from crossing of G.T.R. at mileage 26.54, Cornwall Tp. to Cornwall, Ont., 2,000 ft. southwest.

22492. Sept. 3.—Authorizing C.P.R. to build spur for Northern Sand and Gravel Co. at Milner, Man.

22493. Sept. 3.—Authorizing C.P.R. to open for traffic single track diversion, from Indian Head to Qu'Appelle, mileage 50 to 59.8; and second track from mileage 59.8 to 67.7, near McLean, Sask.

22494. Sept. 3.—Extending to Oct. 31, time within which C.P.R. shall install gates at St. Thomas and Bonaventure Sts., Three Rivers, Que.

22495. Sept. 3.—Approving location of Erie and Ontario Ry. proposed branches to its freight and passenger stations at Dunnville, Ont., and authorizing crossing of highways there.

22496. Sept. 3.—Amending order 22034, June 23, re crossing of certain highways in Saskatchewan by Canadian Northern Ry.

22497, 22498. Sept. 3.—Approving Bell Telephone Co.'s agreements with Thedford, Arkona and East Lambton Telephone Co., and Lambton Telephone Co.

22499. Sept. 3.—Approving Dominion Atlantic Ry. revision at Bear River Bridge, Digby County, N.S.

22500. Sept. 8.—Authorizing Glengarry and Stormont Ry. (C.P.R.) to build its track and terminal yards within Cornwall, Ont., and to build at grade across certain highways there.

22501. Sept. 4.—Amending order 22367, Aug. 11, re C.P.R. siding for Modern Joint Co., Montreal.

22502. Sept. 3.—Approving C.P.R. and C.N. Ontario Ry. plan, profile, and book of reference, July 25, showing subway proposed at Dovercourt Road, North Toronto Grade Separation; appointing the Senior Judge of York County arbitrator to adjust any claims for damages; and declaring order to be without prejudice to applicants' rights to urge that any of the properties shown on plan are not injuriously affected by the construction.

22503. Sept. 4.—Authorizing G.T. Pacific Ry. to extend its elevator track across road allowance at Asquith, Sask.

22504. Sept. 8.—Authorizing Toronto Eastern Ry. to build Y on Liberty St., Bowmanville, Ont.

22505. Sept. 5.—Authorizing C.N. Ontario Ry. to build spur on Wakefield St., Parry Sound, for Hawkins Bros.

22506. Sept. 4.—Extending to Nov. 26, time within which Canadian Northern Ry. shall build spur for J. H. Carleton, Winnipeg, Man., authorized by order 22086.

22507. Sept. 3.—Approving Canadian Northern Ry. plan showing station proposed at Hughton, Sask.

22508. Sept. 9.—Ordering Edmonton, Dunvegan and British Columbia Ry. to establish 5 special fire patrolmen with velocipedes between mileage 65 and 167, patrol districts to comprise equal distances along track; one additional patrolman to be assigned for each 15 miles of right of way west of mileage 167, upon which construction work is under way during remainder of fire season; men to be maintained continuously until Nov. 1, except in so far as relief be granted by an authorized officer of the Board; men to patrol between 7 a.m. and 6 p.m. each day, including Sunday, with minimum patrol as far as possible of one round trip a day; each foot patrolman to be equipped with shovel and canvas bucket, and each velocipede patrolman with 2 shovels, 2 canvas buckets and an axe.

22509. Sept. 5.—Authorizing C.P.R. to alter spur for City of Winnipeg on Rachael St. E.

22510. Sept. 5.—Authorizing C.P.R. to build spur for Canadian Lock Joint Pipe Co., Regina, Sask.

22511. Sept. 5.—Approving revised location of portion of C.P.R. main line as built, and construction of double track from mileage 2.98, Tp. 68, Algoma District, to mileage 4.84, Tp. 68, Thunder Bay District, Ont.

22512. Sept. 5.—Approving C.P.R. clearances of gantry crane at Galt, Ont.

22513. Sept. 5.—Authorizing C.P.R. to build spur for Winnipeg Supply and Fuel Co., Winnipeg.

22514. Sept. 5.—Authorizing G.T. Pacific Branch Lines Co. to build spur for Tofield Clay Products Co., Tofield, Alta.

22515. Sept. 5.—Authorizing C.N. Alberta Ry. to build spur for Pembina Coal Co., near Entwistle, Alta.

22516. Sept. 8.—Authorizing C.P.R. to build under Kootenay Central Ry. at mileage 91.98 from Colvalli, B.C.

22517. Sept. 9.—Approving plans B-1-1392, July 3, showing rebuilding of bridge carrying G.T.R. over C.P.R. near Myrtle, Ont., with minimum clearance of 22 ft. 6 ins.

22518. Sept. 9.—Authorizing Glengarry and Stormont Ry. (C.P.R.) to build across highways between Lancaster and Charlottenburg Tps., at mileage 12.81 and 12.85, and to divert road at latter point.

22519. Sept. 9.—Approving amended location of G.T. Pacific Ry. station at Midlake, mileage 365.5, Prince Rupert East, and rescinding order 16278, Apr. 9, 1912, approving location at mileage 365.

22520. Sept. 9.—Ordering G.T.R., within 60 days, to install improved type of automatic bell at highway crossing one mile west of Peterborough, Ont., 20% of cost to be paid out of railway grade crossing fund; trains limited to 10 miles an hour until bell has been installed.

22521. Sept. 8.—Extending to Sept. 30, time within which G.T.R. shall complete subway under its tracks at Ste. Anne de Bellevue, Que.

22522. Sept. 8.—Authorizing Town of Trenton, Ont., to lay sewer under C.N. Ontario Ry. and Central Ontario Rv. at Quinte St.

22523. Sept. 9.—Ordering Boston and Maine Rd., within 60 days, to install improved type of automatic bell at highway crossing near Ayers Cliff, Que., 20% of cost to be paid out of the railway grade crossing fund.

22524. Sept. 9.—Authorizing Erie and Ontario Ry. to cross G.T.R. at grade in Moulton Tp., Ont., crossing to be protected by interlocking plant.

22525. Sept. 9.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to take certain lands in Belleville, Ont., for team yard, and reserving application for closing or diverting streets, and application of city for separation of grades at certain highway crossings.

22526. Sept. 10.—Authorizing Canadian Northern Ry. to open for traffic its revised line across Rainy Lake, Ont., from mileage 226.4 west of Port Arthur, on Island G. 622, westerly to mileage 227.2 at junction with main line.

22527. Sept. 10.—Authorizing C.P.R. to build spur for Richardson Builders, Ltd., Saskatoon, Sask.

22528. Sept. 10.—Extending to Nov. 30, time within which Campbellford, Lake Ontario and Western Ry. (C.P.R.) shall install bell at crossing of Kingston Road, near Belleville, Ont.

22529. Sept. 10.—Approving C.P.R. plan of automatic signals required for gauntlet tracks over Columbia River bridge, mileage 1.6, Shuswap Subdivision, B.C.

22530. Sept. 10.—Authorizing C.N. Manitoba Ry. and Canadian Northern Ry. Oak Point Branch to connect in Sec. 28-28-8, near Deerfield, Man.

22531. Sept. 10.—Authorizing Canadian Northern Ry. to open for traffic its high level freight tracks over Assiniboine River and viaduct over Main St. and trestle connecting with old line at Clark St., and from east end of Assiniboine River bridge to Clark St., Winnipeg.

22532. Sept. 11.—Dismissing Nelson and Fort Sheppard Ry. (G.N.R.) application for elimination of flag stops at Meadow spur, and Benson and Ross spur in B.C.

22533. Sept. 10.—Rescinding order 14351, July 25, 1911, re Canadian Northern Ry. precautions at crossing of Red River between Emerson and Emerson Jct., Man., and providing other regulations.

22534. Sept. 11.—Authorizing Canadian Northern Ry. to open for traffic its line from Adelpha, Man., mileage 51.84 to 79.70, speed not to exceed 20 miles an hour.

22535. Sept. 11.—Approving location of Esquimalt and Nanaimo Ry. flag station at Craigs, B.C.

22536. Sept. 11.—Authorizing Ops Tp. and Manvers, Ont., at expense of C.P.R., to build highway over Georgian Bay and Seaboard Ry. (C.P.R.), at mileage 9, Port McNicoll Subdivision.

22537. Sept. 12.—Amending order 20859, Nov. 21, 1913, re installation of gates by C.P.R. at crossing of Whyte St., Edmonton, Alta.

22538. Sept. 11.—Approving Edmonton, Dunvegan and British Columbia Ry. location through Tps. 78 and 77, R. 23 and 24, w. 5 m., Alta., mileage 284 to 307.

22539. Sept. 10.—Amending order 21418, Feb. 14, re C.P.R. spur on Harbor Quay, Goderich, Ont., by substituting another plan, and authorizing building of spur across dock spur to G.T.R.

22540. Sept. 15.—Authorizing C.N. Ontario Ry. to build temporary timber crossing, until Dec. 31, over C.P.R. near Pembroke, Ont.

22541. Sept. 14.—Authorizing C.P.R. to build ballast pit spur at grade across highway in Lot 6, Con. 5, Vanhorne Tp., Ont.

22542. Sept. 14.—Approving proposed interlocking plant for C.P.R. double track swing bridge at Harrison Mills, B.C.

22543. Sept. 12.—Authorizing C.P.R. to open for traffic its Kootenay Central Branch from Spillimacheen to Edgewater, B.C., mileage 41 to 59, Chief Engineer to file with Board by Sept. 30, affidavit that public road crossings at mileage 41.2, 42.5 and 48.5 and crossing at Spillimacheen have been completed in accordance with Board's Standard Regulations.

22544. Sept. 14.—Approving Bell Telephone Co.'s Agreement with Huntsville and Lake of Bays Telephone Co.

22545. Sept. 14.—Authorizing Saskatchewan Board of Highway Commissioners to build highway crossing over G.T. Pacific Ry. north of Rutan Siding, Sec. 22-35-27, w. 2 m.

22546. Sept. 15.—Authorizing Erie and Ontario Ry. to cross and use Toronto and Niagara Power Co.'s right of way in Lot 32, Con. 5, Gainsboro Tp., Ont., without prejudice to rights of seniority, if any, of T. & N.P. Co.

22547. Sept. 14.—Approving Bell Telephone Co. agreement with Second Line Drummond Telephone Co.

22548. Sept. 14.—Authorizing Canadian Northern Ry. to build spur across Second St., Fort Frances, Ont., for J. Harty and L. J. Marsh, and rescinding order 15306, Nov. 10, 1911, in same connection.

22549. Sept. 14.—Authorizing Pere Marquette Rd. to maintain station at Tupperville, Ont., as a flag station.

22550. Sept. 12.—Authorizing C.P.R. to alter spur approved by order 20710, Nov. 4, for McCormick Mfg. Co., London Tp., Ont., and approving clearances of same.

22551. Sept. 14.—Authorizing C.P.R. to open for traffic its double track, from mileage 116.8 to 123.8, Whitewood, to Percival, Sask.

22552. Sept. 15.—Approving clearances of C.P.R. standard 30 ft., 40 ft., 50 ft. freight sheds and standard no. 2 ice house.

22553. Sept. 15.—Authorizing British Columbia Electric Ry. Co. to build across C.P.R. in District Lot 347, Port Moody, B.C., all cars and trains to be stopped before making crossing.

22554. Sept. 15.—Extending for six months from date time within which City of Fort William, Ont., shall complete half-interlocking plants at crossings of Canadian Northern Ry. by Fort William Electric Ry. at Victoria Ave. and Vickers St., and at intersection of Franklin St., as required by order 19319, May 15, 1913.

22555. Sept. 15.—Approving International Bridge and Terminal Co. bylaw 2, July 28, authorizing B. G. Dahlberg, General Freight Traffic Agent, to prepare and issue tariffs of the tolls.

22556. Sept. 15.—Approving G.T. Pacific Ry. station and site at Marten Lake, mileage 378.4, Prince Rupert East, B.C.

22557. Aug. 15.—Authorizing C.P.R. to build its Moose Jaw South Westerly Branch at grade across highways between mileage 57.59 and 59.61 from Moose Jaw, Sask.

22558. Sept. 16.—Approving location of Canadian Northern Ry. station at Clouston, Sask.

22559. Sept. 17.—Authorizing St. John and Quebec Ry. to build across C.P.R. spur at mileage 20, Fredericton Branch, for Fraser, Ltd., Fredericton, N.B.

War Time Transportation.

At the time of writing the war has been in progress seven weeks, the first shock has expended itself, and those who were of opinion that we had reached the end of all things, are beginning to realize that the world is still revolving on its axis; that there is still work to do, and a stern necessity for doing it. In the present time, those who worship precedent are wasting their time and the time of the community, as there is no precedent suitable for present day contingencies.

The chief element making for success in military and naval manoeuvres is mobility, and the mobility of armies and navies in the last great wars of 1815 and 1870 cannot for a moment be compared with that which obtains today. The great advance in the means of transportation, of recent years, has not only increased the efficiency of belligerents, but forms the backbone of the immense commerce which has been built up throughout the world. This advance has been equally great in transportation by land and sea, and situated as Canada is, midway between the large manufacturing centres of Europe and the increasing markets of the Antipodes and the Orient, there is, under normal conditions, a constant flow of transoceanic and transcontinental traffic across the Dominion in both directions, in addition to that absorbed and originating locally. Though there is a considerable amount of traffic, which both originates and terminates within the Dominion, it may be taken for granted that the greater portion either originates across one of the oceans, or is intended to cross the water, thus showing the interdependence of the two means of transportation, by land, and water. Anything, therefore, which dislocates the vessel traffic with the Dominion is also detrimental to the interior traffic, and all conceivable means should be adopted to promote and maintain steamship communication on transoceanic routes.

The merchant shipping of the British Empire for 1913 comprised 11,886,300 net tons, heading the list of the countries of the world, and totalling more than the next six countries. The activity of the British navy in the early stages of the war practically cleared all the recognized ocean routes, and the risk of capture by foreign vessels is comparatively limited. This was made abundantly clear recently by the quotations of insurance rates for war risks in London, Eng. It is stated that the rate, practically everywhere but in the North Sea, was at first fixed at 5 guineas; it was later reduced to 4 guineas, and again lowered to 3 guineas, and towards the end of August it was possible to insure almost any voyage by British vessels at 40s. per cent.

While practically all the chief vessels operating to Canada have been requisitioned by the Admiralty for war purposes, the situation is opened to an unlimited number of tramp steamers, and these should be encouraged to come in and handle the traffic, which is of equal necessity for Canada and Great Britain. The only markets which are closed to products of the Dominion are those of continental Europe, and even some of these are available, and the remainder of the world is open. Great Britain is still capable of manufacturing articles which we require, and Great Britain requires Canada's food products; therefore only a combined determined effort is necessary to maintain a steady flow of traffic across the Atlantic and Pacific Oceans by way of Canada. Sir Algernon Firth, President of the Associated Chambers of Commerce of Great Britain, and a member of the British War Risks Insurance Committee, stated recently that at a meeting of the committee some very satisfactory information was given as to the routes then open, and as to further routes to be opened shortly. It was also pointed out that insurance rates had fallen considerably, and that no doubt they would be further reduced shortly, so as not to prohibit any reasonable transactions. A good deal of difficulty had been experienced in shipping goods, not because vessels could not leave ports, but because so many were taken up by the Admiralty, but the situation is now being eased every day and vessels are resuming their sailings.

The Chancellor of the Exchequer said recently:—"It is vital that British shipping in every part of the world should be protected, and a little reflection will show that in order to maintain the stream of supplies of necessaries for the people, we have to keep going the whole mechanism of overseas trade."

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decrcases, compared with those for 1913-14, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase
July	$1,594,300	$1,163,800	$430,500	x$83,800
Incr.	.....	$ 250,700	.....	.....
Decr.	$ 334,500	.....	$ 83,800	.....

x Decrease.

Approximate earnings for August, $1,367,700, against $1,824,800 for Aug., 1913.

Mileage operated in July, 4,670, against 4,516 in July, 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1913-14, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$10,481,971.72	$6,703,525.89	$3,778,445.83	x$338,347.55
Incr.	.....	.....	.....	.....
Decr.	$1,511,090.55	$1,172,743.20	$ 338,347.55	.....

x Decrease.

Approximate earnings for August, $9,532,000, against $11,062,000 for Aug., 1913.

Grand Trunk Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, etc., from July 1, 1913:—

	Gross Earnings	Expenses	Net Earnings	
July	$4,724,000	$3,668,200	$1,055,800	.....

Approximate earnings for August, $4,853,740, against $5,154,213 for Aug., 1913.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch for August were $470,700, against $462,036, and for the two months ended Aug. 31, $900,453, against $981,592.

S. King, of London, Ont., ex-Superintendent Canadian Car and Foundry Co., Ltd., and now a director of the National Steel Car Co., writes Canadian Railway and Marine World: "I really enjoy reading the articles in your valuable paper, as they are strictly up to date, and contain such concise information covering the territory of this Canada of ours that it keeps one posted on the great advancement and progress which is being made."

Reduction in Elevator Charges. The Dominion Grain Commission has eliminated the charge of 1% for shrinkage on tough and damp grain, from the general tariff, and has reduced the charge for bin-burned and heated grain to ¾c.

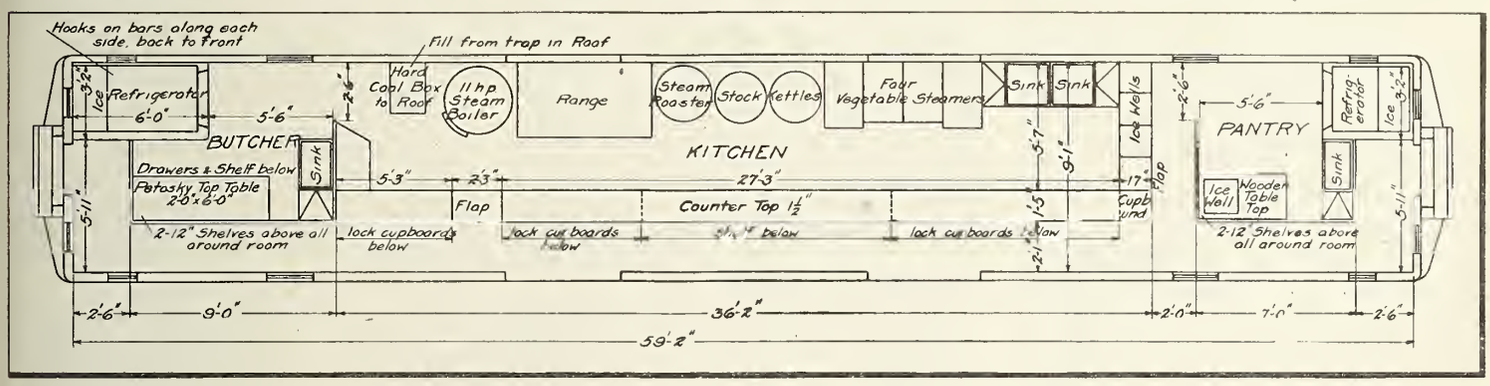
Military Commissary Kitchen Cars on the C.P.R.

In the transporting of troops from various points to the concentration camp at Valcartier, Que., a big problem was presented, for while the transportation itself was a considerable task, the problem of feeding the men through the journey presented greater difficulties, as none of the existing railway equipment could be directly used for the service, the dining car service being entirely inadequate and unsuited to the requirements. The C.P.R. solved the difficulty by converting 12 standard 60 ft. baggage cars into commissary kitchen cars. This conversion was made at the company's Angus shops, Montreal, to the designs of W. A. Cooper, Manager, Sleeping, Dining and Parlor Cars and News Service, and under his personal supervision. The layout of the cars is shown herewith.

Essentially, each of the cars is a well appointed hotel kitchen on wheels, and comprises three main sections, kitchen proper, butcher shop and pantry. The interior corridor arrangement resembles the company's compartment cars, as from each end the passage leads from the central entranceway and along a 2 ft. 1 in. corridor on one side of the car. The two baggage door openings on the corridor side are fitted with permanent screens for ventilation purposes, and the similar openings on the other side have been blocked up.

The butcher shop and pantry are in partitioned off rooms, while between the two car three tanks of water, giving a total capacity of 1,490 imp. gals. All the sinks have a supply of both hot and cold water. The windows and doors are equipped with screens, to keep out insect pests.

For serving the meals the orderlies from each company file in from one end of the car, line up in front of the counter, are allotted the portions for their men, and pass out of the other end as rapidly as served. The operation of the car is said to be most satisfactory, exceeding the expectations, the capacity of each car being 1,000 meals, three times a day. The crew consists of 12 men in charge of a steward, one of the twelve being a boiler man, and the others cooks.



Military Commissary Kitchen Car on Canadian Pacific Railway.

is the main part of the kitchen, 36 ft. 2 ins. long. Along the corridor side of this kitchen is a full length counter, with two flap entrances, with cupboards and shelves below, through the full length. Along the blind wall of the car is arranged the cooking apparatus, consisting of steam roaster, 2 stock kettles, 4 vegetable steamers, a large range, and other facilities. These are nearly midway in the kitchen proper, with two sinks at one end and an 11 h.p. vertical steam boiler, with adjacent hard coal bin, at the other end, for supplying steam to the cookers.

The butcher shop contains a large table, 2 by 6 ft., with a sink in one corner, the rear corner being occupied by a 6 by 3 ft. 2 in. refrigerator, wherein the meat is kept fresh. The pantry at the other end of the car contains a table, sink and a smaller refrigerator. It has two 12 in. shelves all round the room.

The agateware plates used are suspended from the roof, and the shelves and cupboards under the counter are used for storing plates, saucers and dishes of various kinds, and also the knives, forks and spoons. The orderlies' soup and coffee carrying cans are suspended directly over the counter. Vegetables are stored in boxes underneath the car. In addition to an overhead storage of water, there are suspended beneath the

Railway Finance, Meetings, Etc.

Buffalo and Lake Huron Ry.—The available balance for the half year ended June 30, including the amount brought forward from the previous half year, is £15,020, after providing for the interest on the first and second mortgage bonds. From this amount the usual dividend of 5s. 3d. a share, amounting to £13,784, will be paid, leaving a balance of £1,235 to be carried forward to the current half year's account. This railway is operated under lease by the G.T.R.

Canadian Pacific Ry.—A notice has been issued, advising those who hold shares, which may still be registered in the names of German or Austrian subjects, to communicate with the company's London office with regard to the payment of dividends. This is following on the British Government's instructions that dividends which may be payable to German or Austrian subjects shall be withheld by the various companies concerned, and not paid to the holders of such shares, nor to their order.

Central Ry. of Canada.—There has been deposited with the Secretary of State at Ottawa a mortgage deed upon the company's undertaking and assets, made with the City Safe Deposit and Agency Co., London, Eng.

Dominion Atlantic Ry.—A special meeting of shareholders will be held in Montreal, Oct. 6, to consider the advisability of leasing the Intercolonial Ry.'s Windsor branch, and to approve and confirm the lease. The Windsor branch has been for years operated by the D.A. Ry., under an agreement with the Department of Railways on a percentage basis.

Grand Trunk Pacific Ry.—There has been deposited with the Secretary of State at Ottawa a mortgage deed made between the company, the Royal Trust Co., and the Crown, securing an issue of the company's bonds which have been guaranteed by the Dominion Government, under the provisions of the Act of Parliament of last session.

Grand Trunk Ry.—In accordance with the Grand Trunk Act of 1914, the company's accounts are now being made up annually to Dec. 31 in each year, instead of semi annually, but the directors are empowered to declare an interim dividend for the first half year, as they may deem advisable, thus following the practice of other railways. They have accordingly declared the full dividend on the 4% guaranteed stock for the half year ended June 30, payable Oct. 31.

Klondike Mines Ry.—The officers and directors for the current year, elected at the recent annual meeting at Ottawa, are: President, H. B. McGiverin; Vice President. J. P. Ebbs; Secretary, A. Haydon; other directors, J. Latta and C. G. Kekewich.

Lake Erie and Northern Ry.—A meeting of shareholders will be held in Montreal, Oct. 5, to approve resolutions cancelling a mortgage of $500,000, securing second mortgage bonds, and to issue other bonds to secure further construction, to be secured by a new mortgage. This is necessary owing to the leasing of the line to the C.P.R. for 999 years at a rental equal to the interest on bonds issued or to be issued by the company. The shareholders will also be asked to approve of the lease, which will also be approved at the annual meeting of C.P.R. shareholders to be held Oct. 7.

Montreal Central Terminal Co.—There has been deposited with the Secretary of State at Ottawa a mortgage deed upon the company's undertaking and assets, made with the City Safe Deposit and Agency Co., London, Eng.

Temiscouata Ry.—Net earnings for July, $6,208.

Toronto Terminals Ry. Co.—The annual meeting was held at Montreal, Sept. 8. Following are the directors for the current year: H. G. Kelley, President; D. McNicoll, Vice President; J. W. Leonard, Managing Director; Sir Thos. G. Shaughnessy, E. J. Chamberlin, J. E. Dalrymple. The other officers are: H. Philips, Secretary; H. E. Suckling, Treasurer; W. H. Ardley, Auditor; W. C. Chisholm, General Solicitor; J. R. W. Ambrose, Chief Engineer.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Aug. 21, $1,078,882, against $602,616 for same period 1913.

Railway Lands Patented.—Letters patent were issued during July, covering Dominion lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Calgary and Edmonton Ry.	1,440.00
Canadian Northern Ry.	109.34
Canadian Pacific Ry. grants	15.26
Canadian Pacic Ry. roadbed and station grounds	26.75
Total	1,591.35

Canadian Pacific Railway Construction, Betterments, Etc.

Atlantic Division.—The fireproof elevator, with 1,000,000 bush. capacity, at West St. John, has been completed.

At McAdam Jct. the new machine and erecting shop and about a mile of additional storage tracks have been completed.

Eastern Division.—Work is reported to be in progress on the new freight sheds at the Palais, Quebec, where there are to be built two sheds, one 500 by 50 ft., and the other 360 by 55 ft. The buildings are to be fireproof and the contract calls for their completion, Nov. 1. Downing and Cork, Montreal, are the contractors.

Ontario Division.—We have been officially advised that the company has no immediate intention of extending the Georgian Bay and Seaboard Ry. from Bethany Jct. to Belleville, Ont., on the Campbellford, Lake Ontario and Western Ry., or of building an extension of the latter from Shannonville into Kingston, as stated in press reports. The extensions have been surveyed and plans are said to have been filed.

The first half of the rebuilding of the bridge across the Humber River between Lambton and Islington has been completed, and traffic was shifted over to it from the old bridge, Sept. 21. The superstructure of the old bridge was being removed, Sept. 22, preparatory to raising the old piers, and completing the new piers so as to take the new superstructure.

Campbellford, Lake Ontario and Western Ry.—The Lake Ontario Shore Line is the name which has been given to this new line from Glengarry to Agincourt, Ont., which, with the old Ontario and Quebec Ry. line between those points, now gives a continuous second track between Montreal and Toronto. The new line, 182.6 miles long, has ruling gradients of only 0.4% each way and the maximum curve is 4 degrees. In general the right of way is 100 ft. wide, embankments up to 16 ft. high are 16 ft. wide and higher ones 18 ft. Both in the right of way and in grading the probability of future double tracking was kept in mind, sufficient land being bought for the purpose wherever possible and embankments and cuts made for the additional track. All bridges and culverts are of steel and concrete. The principal steel structures are those over the Ganeraska River and the town of Port Hope, 1,800 ft. long; over the Trent River and Canal at Trenton, 1,493 ft. long; over Mud Lake, 964 ft. long, and over Dixie Creek, 916 ft. long; most of these are viaducts with few spans exceeding 90 ft. in length. At Mud Lake, in order to secure a solid foundation, it was necessary to carry the centre pier down to 103 ft. below the water level to reach bed rock; another pier had to be carried down 56 ft., and a third 30 ft.; these three piers were sunk under air pressure, using reinforced concrete caissons with steel cutting edges. Quantities of material used in the work include 7,500,000 cu. yds. of grading, of which 1,300,000 were solid rock, 100,000 yards masonry, and 15,200,000 lbs. steel. The cost was about $11,000,000, or approximately $60,000 a mile, and conformed closely to the estimates made before the work began.

Saskatchewan Division.—The Board of Railway Commissioners has authorized the opening of the Weyburn West branch line between Shaunavon and Gowanlock, Sask., mileage 230.8 to 307.3.

Grading on the extension of the line from Moose Jaw, now terminating at Expanse, has been in progress for some time, about 15 miles having been graded southerly from Expanse by Dubbin and Timson. These contractors were reported recently to be grading on an eight mile section from Assiniboine towards the point reached from Expanse.

The Minister of Railways has approved of a revision of the Swift Current southeasterly line from tp. 11, range 10, west 3rd meridian to tp. 15, range 27, west 2nd meridian, 85 miles.

We are officially advised that, while the route map for a projected line between Dunelm and Instow, Sask., has been approved by the Minister of Railways, it is not contemplated to undertake its immediate construction. Dunelm is nine miles from Swift Current, on the line southeasterly to Vanguard, and Instow is about 28 miles south of Gull Lake, on the main transcontinental line.

Alberta Division.—The Board of Railway Commissioners has authorized the opening for traffic of the Lacombe easterly branch from Monitor to Kerrobert, mileage 149 to 221.3.

The extension of the line easterly from Stirling to the Alberta-Saskatchewan boundary, which is being built as the Weyburn-Lethbridge line, and is now completed and in operation to Foremost, is being pushed ahead from the latter point. G. H. Webster has the contract for grading some 25 miles. This will leave a gap of about 60 miles to the boundary line, to which point track laying has been completed through Saskatchewan. Grading is in progress on nearly the whole of this mileage.

Surveys are reported to have been completed for the building of a loop line with Pincher Creek, starting out from Mannsell, four miles east of Pincher station. Recent local reports stated that the loop would be built this year.

Press reports from Taber, Alberta, state that it is expected to have the spur track laid from the C.P.R. gravel pit near there to the bridge at the river, giving a rail connection to the Superior Coal Co. early in September. The coal company is making considerable improvements at its mines preparatory to resuming active mining operations.

Rogers Pass Tunnel.—Press reports state that at Sept. 10 the progress made at the eastern side of the tunnel at Rogers Pass was as follows:—Pioneer heading, 4,107 ft.; main heading, 1,127 ft.; west side, pioneer heading, 1,127 ft.; main heading, 406 ft. This is considered to be good work when the extreme difficulties are considered.

A tri-weekly train service has been put in operation on the Alberta Central Ry. from Red Deer, on the Calgary and Edmonton branch, C.P.R., to Rocky Mountain House, Alberta, 73 miles.

Kootenay Central Ry.—Track has been laid on over 30 miles of grading beyond Spillimacheen, B.C., on the uncompleted middle section of this line, and it was announced that a train service would be put on 27 miles of this track, Sept. 27. The entire line will extend from Golden, on the main transcontinental line to Coalmount on the Crowsnest Pass line, 160 miles. Spillimacheen, to which point trains are in operation, is 40 miles from Golden. The line is finished from Coalmount northerly for about 40 miles, but has not been opened for traffic. (Aug., pg. 357.)

C. T. Ridalls, Car Foreman, C.P.R., London, Ont., writes:—"Canadian Railway and Marine World is the most reliable paper I receive and I would not be without it."

Railway Route Maps Approved.

The Minister of Railways has approved of route maps as follows:—

Canadian Pacific Ry., Aug. 26.—Revision of Swift Current southeasterly line from tp. 11, range 10, west 3rd meridian to tp. 15, range 27, west 2nd meridian, 85 miles.

Canadian Northern Ry., Aug. 26.—Revision of North Battleford—Athabasca Landing line, between tp. 51, range 21, west, and tp. 55, range 24, west 3rd meridian, 33.46 miles.

Canadian Northern Manitoba Ry., Aug. 26.—Through tp. 28, ranges 8, 9 and 10 west principal meridian, Man., 12.37 miles.

Edmonton, Dunvegan and British Columbia Ry., Aug. 26.—Revision in tp. 77, range 19, west 5th meridian, and from tp. 78, range 25, west 5th meridian, to tp. 78, range 7, west 6th meridian, 75 miles.

Grand Trunk Railway Betterments, Construction, Etc.

Bonaventure Station, Montreal. — The Board of Railway Commissioners, Sept. 15, authorized the company to lay two additional tracks from St. Henri into Bonaventure station, Montreal. In granting the application the Board directed that the laying of the additional tracks is to be without prejudice to the city's rights in connection with the track elevation plans under consideration. It was stated at a meeting of the City Council Railway Committee that it was expected the tracks would be laid this year. Some members of the committee expressed a wish to fight the order.

Belleville-Midland Branch. The line between Belleville and Hastings, Ont., 41.10 miles, is to be relaid with 80 lb. steel rails this autumn, releasing 56 lb. rails.

Track Relaying London West.—Work was reported to have been resumed, Sept. 1, at Wanstead, Ont., on relaying the line from London to Windsor, with heavier steel rails. (Aug., pg. 372.)

Government Railways Employes' Relief and Insurance Fund.—The 25th annual report of this fund, which is managed by officials and employes of the Intercolonial Ry. and the Prince Edward Island Ry., shows a credit balance for the year ended June 30 of $47,468.35, against a credit balance of $39,714.53 at June 30, 1913. The receipts from all sources were $94,779.23, and the total expenditures $87,025.46. The sick and accident fund shows a credit balance of $19,425.90; the temporary employes' accident fund a surplus of $20,672, and the death and total disability fund shows the total claims paid for the year were $40,000.

The International Brotherhood of Maintenance of Way Employes held its annual convention at Winnipeg in September. Over 400 delegates were present. A. E Barker, Portage la Prairie, Man., was elected Grand President. Other Canadians elected to office are: H. Owen, Portage la Prairie, Man., a Vice President; G. Seal, Portage la Prairie, Secretary-Treasurer; R. Low, Windsor, Ont., Past Grand President; M. J. Powers, Toronto, Past Grand Vice President; W. Dorey, Woodstock, N.B., W. V. Turnbull, St. John, N.B., members of advisory board. The next convention will be held at Detroit, Mich., in 1917.

Change in G.T.R. Car Steps.—The G.T.R. and G.T.P.R. have adopted a new design for car steps, viz., a 4 tread step, which reduces the distance from the rail to the top of the first tread to 14 ins., making mounting and dismounting easier in the case of low platforms.

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Pushing the Canadian Northern Railway Transcontinental Line to Completion.

It is gratifying to note that the war has not made any appreciable difference in regard to the construction of the C.N.R.'s main transcontinental line. The construction forces have not been reduced, except as sections have been completed, and there has been no slackening of speed in the carrying on of the work.

It will be remembered that out of the $45,000,000 of debenture stock guaranteed by the Dominion Government at its regular session in June, $15,000,000 was offered to the public in England in July. This issue had only been offered for about a day when war was declared and in that time 21% was subscribed for by the public, a pretty good indication that the whole of it would have been taken in the three days during which the subscription lists were announced to be open, had not war broken out. The whole issue had of course been underwritten, and the underwriters have not taken undue advantage of the British moratorium, but have already paid over practically the whole amount of the issue.

At the time of writing there is every prospect that very nearly the whole of the track will be laid on the entire main line from Montreal to New Westminster by the end of this year and that what little tracklaying may then remain uncompleted will be finished very soon thereafter.

No Stoppage of Work on the Pacific Great Eastern Railway.

A statement issued over the signature of D Arcy Tate, Vice President of the Pacific Great Eastern Ry. says:—"Following a conference which Messrs. Stewart and Welch have had with the Premier of British Columbia, I beg to say that it has been decided to continue the construction of our railway without reducing the force on account of the outbreak of war

"The Premier was strongly of the opinion that in view of the fact that our bonds have been sold and that the proceeds are in the bank at Vancouver, it would be most in the interest of the public and of the workingman, who still requires his three meals a day, to prosecute the work as vigorously as possible. 'Full speed ahead' he urged and so it was decided."

Particulars of the progress of construction on this line, which is being built from Vancouver to Fort George, B. C., about 480 miles, will be found under "Railway Development" on another page of this issue.

An Unfounded Report About Train Service Reduction.

The following Canadian Press dispatch was published in a lot of daily papers:—

"London, Ont., Sept. 7.—It was reported here today that commencing a week from today, the C.P.R. is to do away with eight passenger trains on the Ontario division for an indefinite period. The move is ascribed to a falling off in traffic owing to the war. Two trains passing through London are said to be affected."

Such a report as the foregoing spread all over the country does a lot of harm, creating an entirely erroneous impression. As a matter of fact, we are officially advised that under the new time table the only trains to be taken off are nos. 7 and 8 between Toronto and Winnipeg, which had not been established as permanent trains, both being merely in the experimental stage. None of the trains passing through London are interfered with.

The Canadian Press, Limited, would do well to caution its correspondents to exercise more care in the preparation of their dispatches and not to send out foundationless stories.

Dominion Public Works to Go on Without Interruption.

A special dispatch from Ottawa says:—"The government is preparing for the exigencies of the coming winter by making arrangements for the continuance of all big public undertakings now under way. In so far as weather conditions will permit operations will be maintained all winter.

"At Halifax extensive terminals of the Intercolonial Railway and a new entrance of that road are being built. At St. John, N.B., the extensive harbor improvements at Courtenay Bay are going ahead and Quebec, Montreal and Toronto have similar big jobs in progress.

"Then there are the Welland Canal works, the Port Arthur and Fort William works and new docks and harbor works at Vancouver and Victoria, along with the Hudson Bay Ry., and a long list of minor works. Some of these will necessarily be affected to a certain degree anyway by the winter weather, but the general intent is to keep large staffs at work, thus ensuring employment and the circulation of public money."

Reflections on the European Crisis With Regard to Canadian Industries.

By H. R. Hamer, Assistant General Foreman, Locomotive Shops, C.P.R., West Toronto.

Not very long ago, when Great Britain, in common with her allies, declared war on Germany, there were many pessimists in this country who predicted a complete cessation of industrial activities. The pessimist will point out that a great amount of short time prevails, but while admitting this statement to be true, the writer would reply that this state of affairs existed long before the outbreak of war.

At the same time there is room for great improvement in the industries of this country, and it may be said without fear of contradiction, that with Germany excluded from our markets many products heretofore bought from Germany will be manufactured and sold in Canada. Indeed, the tendency (even before the spark which ignited the European conflagration was applied), was toward purchasing more of British, United States and domestic products. This is particularly true with reference to steel locomotive tires, machine tools, tool steel and railway supplies, etc.

The writer—to digress for a moment—has endeavored, by direct questioning of men interested in mechanical production, to come at the reason as to why all of the steel locomotive tires are purchased outside of Canada, and was very much surprised to find that the knowledge of this subject was so limited. Surely there is enough demand in Canada for this commodity to warrant the equipment of a plant to manufacture steel tires. Or if it should prove impracticable to make this article in the Dominion, it would be more in keeping with an imperial spirit to open our doors wider to the exports of Great Britain. In the event of Britain not being able to supply the demand, then let us turn to the country with whom we recently celebrated the completion of one hundred years of peace, rather than pour our money into the coffers of a country, whose sole aim for over twenty years past appears to have been militarism.

But to return to the main subject. Since the opening of hostilities the united press

of Canada has done much, through the individual papers' editorial columns, to calm the fears of the small manufacturers, and this, coupled with the national patriotic spirit, has conduced to steadying what otherwise might have been an industrial panic. Indeed, one may say, that, with the revival of trade, Canada will benefit, together with the United States, in view of the fact that a wider field of industry will be open to them. Many Canadian producers are recognizing the fact, in common with their southern neighbors, that this is an opportunity, to be secured only by prompt action, and diligent application in commencing at once to build up in their respective countries those lines of industry which the German manufacturers previously monopolized.

While pointing out the foregoing, the writer would say that a mushroom growth of trade is not to be expected immediately, for to carry on some of the different industries new machinery must be built and operators trained to run it. As an instance of this, take the manufacture of toys. While admiring the quantity of work turned out in this direction by the German people (it may be stated that a large proportion of their toys are made by hand), it must be remembered that this work is carried on mostly by female and child labor, which tends to bring the cost of production to a very low figure. The large increase in cost which would attend such a venture in Canada would necessitate the finding of means whereby these toys could be manufactured by machinery. Hence the question of new machines.

In passing, it will not be out of place to remark on the falling off in the number of immigrants to this country. This is bound to be affected by reason of certain boats of the different shipping companies being taken over by the Government of Great Britain, as a direct result of the war, but the reader is asked to bear in mind, that with the number of unemployed at present in our cities a decrease in the number of people coming to this country to find positions is to be appreciated rather than otherwise.

In conclusion, the writer would say that, all things considered, Canadian industries look out on a much brighter prospect today than was the case at the corresponding period of a year ago. Prominent business men and manufacturers have come to the firing line, with their determination to make business, strengthened by the very fact that adverse conditions appeared to prevail. With this spirit predominant, our eventual success is assured, and it may be said with the utmost confidence that, with the return of normal conditions abroad, Canada will be one of the foremost competitors reaching out for foreign trade.

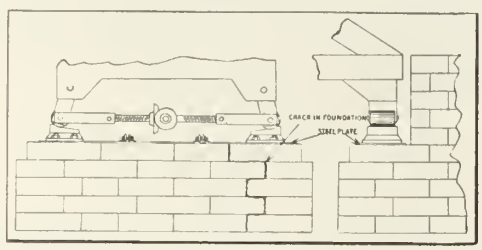
Alleged Frauds on the C. P. R.—About 20 persons, the majority of whom were C. P. R. conductors, with one information clerk, were committed for trial at Toronto, early in September, on a general charge of conspiracy to defraud the company. It is alleged that certain persons obtained tickets allowing them to travel between Toronto and West Toronto, where, on payment of $3 to the conductor, they would be allowed to proceed to Sudbury. The fare from Toronto to Sudbury is $7.70. It is stated that a considerable traffic was carried on in this way, and the company claims to have lost $1,000,000 a year by similar methods.

The President of the British Board of Trade stated in the House of Commons, recently, that he was directing all joint stock companies not to pay dividends which became due after the outbreak of war, to persons resident in the enemy's territories, nor in accordance with their instructions.

Repairs to Masonry on Canadian Pacific Railway Bridge at Sault Ste Marie.

On the end piece of a swing bridge crossing the ship canal at Sault Ste. Marie, Ont., a repair was recently made in a very efficient manner. The bridge is 407 ft. long, over which runs a single track for C. P. R. trains. The swinging and the end piece shoe-jacks operate by electric motors from a centre cabin elevated over the track. From time to time it was found that the bridge tended to tilt to one side, especially the south end, which is on a curve, and finally a serious crack developed in the masonry, which grew worse every day, and in order to keep the bridge safe we had to devise some kind of relief or safeguard to prevent a total rupture.

Arrangements had to be made to make the necessary repairs without interrupting the running of the trains on the track, and at the same time not to interfere with vessels passing through the canal. The accompanying drawing shows the crack in the masonry which amounted to fifteen-sixteenths of an inch, and also shows how the repairs were accomplished. A half inch steel plate was made in three sections, and drilled to



fit on the jackshoe bolts, and one jackshoe at a time was removed and the plate laid in place and the jackshoe replaced. When both plates were secured in position, the centre plate was put in and the bolts screwed down, and when all were in tension the masonry was drawn into its original position, while a mixture of cement was poured into the crack, which made a very good job, as the foundation is now apparently as good as could be desired, and safer than the original structure, as nothing short of an earthquake could move the steel plate that we added to the structure.

Not only so, but it is evident at a glance that a new idea has been added to structures of this particular kind. Masonry under direct vertical pressure is always reliable, but under slightly horizontal pressure of an intermittent kind, such as is caused by the oscillation of a heavy locomotive and attached train rounding a curve, the tendency of the masonry to crack or dislocate is very great, and a reinforcing plate should be used.—J. G. Koppell, electrician in charge of maintenance of electrical equipment, C.P.R. bridges, Sault Ste Marie, Ont., in Railway and Locomotive Engineering.

The International Railroad Blacksmiths Association's 22nd annual convention was held at Milwaukee, Wis., Aug. 18 to 20, the members being received by local officials of the Chicago, Milwaukee and St. Paul Ry.

Among recent subscriptions to the Montreal Branch of the Canadian Patriotic Fund are:—Shedden Forwarding Co., $10,000; Hugh Paton, President, Shedden Forwarding Co., $10,000; H. S. Holt, director, C.P.R., $10,000; R. B. Angus, director, C.P.R., $5,000; Sir Thomas Shaughnessy, President, C.P.R., $5,000; C. R. Hosmer, director, C.P.R., $5,000; R. W. Reford Co., shipping agents, $5,000; Dominion Transportation Co., $2,500; John S. Metcalf Co., $1,000; J. Car-

The Canadian Pacific Railway Tunnel in the Selkirk Mountains.

A correspondent, who visited this work in British Columbia recently, writes: "By following the road leading from Glacier House to the Nakimu Caves, in the Cougar Valley, a capital view of the new route from where it branches from the present line near the loops can be obtained. From one point four railway tracks could be seen. Three were spirals, now used to climb from water level to the summit, circuitous courses notched out of the mountain side and carried on bridges across from one side of the valley to the other. The fourth was the route which veers off and runs to the site of the tunnel as direct as the physical contour of the valley will permit. Considerable excavation was required to obtain the right grade for entering the tunnel at the western portal, and a large amount of filling has to be done near the turning off point. The latter work has, with the exception of a small portion, been finished. An immense amount of rock and gravel has been scooped out by mammoth steam shovels.

"One of the most remarkable features was the diversion of the Illecillewaet River and the utilization of the old bed for the approach. A trench nearly a mile long was dug to divert the former channel of the river in front of the spot chosen for the entrance of the tunnel, and a culvert was built to run it back into its original course lower down. A similar feat was performed in the Beaver Valley to effect a similar purpose.

"Operations were commenced some time ago on the pioneer shaft at the western end, and three preliminary bores have been driven for the main tunnel. The pioneer bore consists of an entirely separate tunnel driven in a line 50 ft. parallel with the course of the main passage through the mountain. The idea is to permit drillers to concentrate their activities at a dozen different points at once instead of having to confine their efforts to one place, as with the usual method. Drifts are projected from the preliminary shaft in the direction of the main tunnel. At the west side of Mount Macdonald the pioneer bore enters the slope several hundred feet above the cutting. It takes a downward course like the shaft of a mine for the first 300 ft. on a 50% grade. Then it goes straight forward and ahead to the mapped out course parallel with the main tunnel. Within the next few weeks the bores from the west end will be well under way. The pioneer shaft at the eastern portal is now 3,000 ft. into the heart of the mountain, and nearly 1,000 ft. of the main tunnel has been driven.

"An interesting feature of the boring operations in the soft material at the start of the main tunnel at the western end is the use of hay to knit together the earth and water which oozes forth as the excavation proceeds. The hay is placed in handfuls between the wooden supports used to keep the preliminary shafts from falling in. Three of the bores had been started when the writer visited the scene, and it was intended to drive two more before clearing out the tunnel to its full width. A steam shovel will be used for this work until rock is reached, when drills will be used. Work is provided at present for about 600 men at the two camps."

R. S. Richardson, Assistant Superintendent, Intercolonial Ry., Moncton, N.B., in remitting his renewal subscription, says: "Your paper is a very welcome visitor. It is like getting a letter from home each month."

Canadian Northern Railway Construction, Betterments, Etc.

Sir William Mackenzie is reported as having stated, Sept. 5, that the British underwriters of the C.N.R. bonds guaranteed by the Dominion Government, had been able, notwithstanding the war conditions, to arrange for the provision of a considerable portion of the funds required to complete the company's transcontinental line and other works on hand. Sir Donald Mann returned east from a trip over the company's lines under construction as far as Victoria, B.C., and was reported to have said in Montreal, Sept. 18, that construction was proceeeding satisfactorily at all points.

Transcontinental Line. There is now continuous track between Pembroke, Ont., and about 40 miles west of the Yellowhead Pass, in British Columbia, and good progress is being made with the balance of the line. Between Montreal and Hawkesbury, Ont., grading is completed and about 34 miles of track laid. The Back River and Isle de Mille bridges are under construction and are to be completed this year, and the whole of the grading, track laying and ballasting is expected to be done this year. From Hawkesbury the line is completed to Fitzroy Harbor, about 40 miles west of Ottawa. Work has been started on the superstructure of the 1,700 ft. bridge over the Ottawa River, which is expected to be completed in February next. From Fitzroy Harbor to Portage du Fort, about 22 miles of grading have been completed, and track laying and ballasting is to be finished this year. At Portage du Fort, where there is another crossing of the Ottawa River, the bridge is practically completed. From Portage du Fort to the bridge crossing of the C.P.R., about 7 miles east of Pembroke, 18 miles, track has been laid and ballasted, so that the line has been completed from Ottawa to near Pembroke, about 87 miles, except the bridges at Fitzroy Harbor and the crossing of the C.P.R. near Pembroke. The substructures of the bridges at the crossings of the Montreal River and of the G.T.R. at Pembroke are completed. From Pembroke track has been laid to Capreol, the junction with the line from Toronto, and from Capreol west there is continuous track to 40 miles beyond the Yellowhead Pass in British Columbia.

Rapid progress is being made on the Canadian Northern Pacific Ry. in British Columbia. From the present coast terminus at New Westminster track has been laid to east of Cisco bridge, about 141 miles. Between Cisco and Kamloops, about 100 miles, there are 10 large bridges over the Fraser and Thomson Rivers, all but two of which are in place and these are being proceeded with. From Kamloops track has been laid both ways, viz., about 15 miles west and about 130 miles east. From Yellowhead Pass track has been laid for about 40 miles west, leaving a gap of about 170 miles between that point and the end of steel being laid east from Kamloops. The grading of the whole line in B.C. is practically completed, except one small tunnel and two cuttings, and it is expected that the whole of the track from New Westminster to Yellowhead Pass will be laid by Feb., 1915, or possibly earlier.

Montreal Tunnel and Terminal Co.—The plans for the temporary station to be erected on Lagauchetiere St., Montreal, which have been prepared by Warren and Wetmore, New York, provide for a three story building—one story being below the street level—of steel and concrete, having a frontage of 150 ft. and a depth along St. Monique St. of 100 ft. The front will be set back 12 ft. from the sidewalk. Seven swing doors will lead into a vestibule, 21 by 100 ft., at the end of which will be the general waiting room, 60 by 100 ft. and 30 ft. high. On one side will be the baggage and express rooms, and on the other ladies' toilet rooms and men's smoking room. The remainder of the ground floor will be laid out for the company's purposes, and the operating offices will be upstairs. There will be three platforms, serving six tracks, which will form part of the trackage of the permanent station. When this is built the present building will be used for other purposes. The cost of the building is estimated at $250,000, and it is said that it will be ready for occupation by next spring. It is said that tenders are expected to be called for during October.

Canadian Northern Ontario Ry.—A contract has been let for the erection of a cooling plant at Trenton on the Toronto-Ottawa line.

The city of Hamilton is reported to have abandoned its objection to the route asked for through the north end of the city, and to be anxious to have construction work started. The route to be followed from Hamilton will connect with the Toronto-Niagara Power line, following it to Falls View, thence circling Niagara Falls city to a point below the whirlpool, where it is proposed to build a bridge across the river to the United States side.

It is expected that a freight service will be started on the main transcontinental line north of Lake Superior from Capreol, Ont., the junction with the line from Toronto, through to Port Arthur, before the end of this year.

Canadian Northern Ry.—The relaying of the Winnipeg-Emerson line with 90 lb. steel is reported completed, and the ballasting almost finished. The track in Saskatchewan is also being relaid with 90 lb. steel, The section on which work is now in progress is between Roblin and Kamsack. It is expected that about 300 miles of track will be relaid with the heavy steel this season. The released 60 lb. steel is being laid on new branch lines.

Grading is reported started by W. J. Cowan, and a number of subcontractors, south of Kindersley, Sask., on the Delisle extension, which it is ultimately intended will connect at Camrose, Alberta. The line will follow the South Saskatchewan River, on the north bank, to the Alberta boundary, where it will turn north. Seven contracting outfits are reported to be at work on the extension.

The Provincial Secretary of Alberta is reported to have said recently that a contract had been let to the Northern Construction Co. for the building of the line southerly from Macleod, and that the McArthur Construction Co. had been given a contract for building about 25 miles to St. Paul de Metis, on the Oliver branch.

Vancouver Terminals.—We are officially advised that there is no foundation for the reports that plans had been filed for a tunnel from Burrard Inlet to the yards now being laid out at False Creek, Vancouver. At present there is no definite information available as to what work is to be done at that point. One of the works to be done is the building of a retaining wall, for which negotiations are in progress with the city council, but we are advised that the details of the agreement have not been worked out, and that the plans have not been prepared, as stated in recent press reports.

Vancouver Island Lines.—It is reported that 100 miles of grading from Parson's Bridge to near the Nitinat River, has been completed and, with the exception of the bridges, is ready for tracklaying. The steel bridges are to be put in as the track is laid at mileages 54, 68, 73, and 75. The grading from mileage 100 to the Alberni Canal, mileage 136.5, is expected to be finished by the end of the year.

The line from Parson's Bridge to Patricia Bay has been graded and is ready for tracklaying, with the exception of the putting in of the steel superstructures of the bridges. Tracklaying is expected to be started on this and the Alberni line in October.

The plans for the wharf at Patricia Bay provide for a dock 441 by 61 ft., with an approach pier, 1,700 ft. long. From Patricia Bay a ferry will be operated to connect with the company's transcontinental line on the mainland. (Aug., pg. 374.)

Grand Trunk Pacific Railway Annual Meeting.

At the annual meeting in Montreal, Sept. 15, President E. J. Chamberlin, who was in the chair, referred to the death of three directors during the preceding 12 months, viz.: Hon. G. A. Cox, W. Wainwright and M. M. Reynolds, and to the retirement, through ill health, of B. B. Kelliher, who was engaged on the preliminary surveys in 1903 and was appointed Chief Engineer in 1905, since when 3,000 miles of railway have been built by the company west of Winnipeg. The present year saw the opening of the line through to the Pacific Coast, and, on Sept. 2, through sleeping car service was established between Edmonton and Prince Rupert. Good progress was reported on the floating dry dock and ship repairing plant at Prince Rupert, a section of which is expected to be ready by the end of November, for repairs to local craft.

The directors for the current year are: E. J. Chamberlin, President; W. H. Biggar, K.C., Vice President and General Counsel; J. E. Dalrymple, Vice President; F. Scott, Vice President and Treasurer; W. H. Ardley, General Auditor; A. W. Smithers, Sir Henry M. Jackson, J. A. Clutton-Brock, Sir Wm. Lawrence Young, H. G. Kelley, E. B. Greenshields, Hon. R. Dandurand, W. M. MacPherson, H. R. Safford and J. R. Booth. The other officers are M. Donaldson, Vice President and General Manager; H. Philips, Secretary; and J. A. Yates, Assistant Treasurer.

Master Car Builders' Association. The following railway officials in Canada have been appointed members of the M.C.B.A. committees:—H. H. Vaughan, Assistant to President, C.P.R., Montreal, car construction; J. Coleman, Superintendent, Car Department, G.T.R., Montreal, arbitration and car trucks; R. W. Burnett, General Master Car Builder, C.P.R., Montreal, car wheels and joint meetings; E. B. Tilt, Engineer of Tests, C.P.R., Montreal, specifications and tests for materials; A. Copony, Master Car Builder, Western Lines, G.T.R., Chicago, specifications and tests for materials; L. C. Ord, Assistant Master Car Builder, Eastern Lines, C.P.R., Montreal, car trucks; H. G. Griffin, General Car Inspector, settlement prices for reinforced wooden cars.

Cuba Rd.—The gross earnings for the year ended June 30 were $5,164,670, and the net income, exclusive of dividends, $1,516,505, against $1,029,258 and $37,448 respectively in 1905, and $2,559,335 and $672,089 in 1910. During last year 6% was paid on the preferred stock, and 6% on the common stock, against a previous 6% and 4% respectively. Sir William Van Horne is President.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—Press reports state that up to Sept. 1, grading had been completed on 95 miles from the point of junction with the Edmonton, Dunvegan and British Columbia Ry., and that 25 miles of track had been laid. The line has been located to Fort McMurray, 180 miles, and it is expected to complete the track laying to Lac la Biche this year. J. D. McArthur, the general contractor, is reported to have said in Edmonton, Aug. 29, that the grading would be completed to Lac la Biche by Oct. 31, and would be continued beyond that place as long as the weather conditions would allow. The line to Fort McMurray he expected would be completed by the end of 1915. (Sept., pg. 418.)

Application is being made to the Alberta Legislature for authority to build a branch from the line now under construction from Lac la Biche, in a generally southeasterly direction to the eastern boundary of the province.

Athabasca Valley Ry.—Application is being made to the Alberta Legislature for an extension of time for the building of this projected railway from near Independence, on the Edmonton, Dunvegan and British Columbia Ry., to Fort Assiniboine, Alberta. J. D. McArthur, contractor for the E.D. and B.C. Ry., and the Alberta and Great Waterways Ry., is the principal promoter of the line. (Dec., 1913, pg. 573.)

Burrard Inlet Tunnel and Bridge Co.—At the annual meeting in Vancouver, B. C., Sept. 10, the following were elected officers and directors for the current year:—President, F. Carter-Cotton; Vice President, Reeve May, North Vancouver; other directors: the Mayor of Vancouver, the Mayor of North Vancouver, the Mayor of West Vancouver, G. W. Vance, G. H. Bridgeman, J. Loutet.

It was expected that the report of R. Mojeski, who has been called in as consulting engineer, upon the three tenders under consideration would be laid before the directors by Sept. 30. He has completed his examination of the plans for the bridge submitted by the firms tendering, made an inspection of the site, and examined the data prepared in connection with the Wolfe-Barry plans for the bridge, which were found to be too expensive. (Sept., pg. 418.)

Dominion Government Ry. to Hudson Bay.—It is reported that operations are being continued without cessation on this line from Pas to Port Nelson, Man., on Hudson Bay, and that good progress is being made not only with the grading and bridgework, but with the tracklaying, and the laying out of the terminals at Pas and Port Nelson. (Aug., pg. 375.)

Edmonton, Dunvegan and British Columbia Ry.—The Minister of Railways has authorized a revision of line in tp. 77, range 19, west 5th meridian, and from tp. 78, range 23, west 5th meridian to tp. 78, range 7, west 6th meridian, 75 miles.

Press reports state that up to Sept. 1 over 70% of the grading had been completed between Sawridge and the proposed crossing of the Big Smoky River, 133 miles. This latter point is about 290 miles from Edmonton, the starting point of the line. (Sept., pg. 413.)

Erie and Ontario Ry.—Rapid progress is being made, according to local press reports, with the building of this railway from Smithville, Ont., on the Toronto, Hamilton and Buffalo Ry., to Dunnville, 15 miles. The fencing is well forward and three large gangs are engaged on the grading, which involves handling about 8,000 cu. yd. to the mile. The maximum grades will be 0.4% and maximum curvature 3 deg. on the main line and 8 deg. on branches to the terminals. Connection has been made with the Michigan Central Rd., at Attercliffe, by switch, and rails, ties and other materials are being delivered. The plans call for building an 87 ft. steel bridge over Twenty Mile Creek; two 160 ft. trestles over Welland River and Oswego Creek, and a passenger station with a freight shed at Dunnville. It is expected to start tracklaying early in October.

The final section of the line to Port Maitland, 4.5 miles, will not be gone on with before next spring. It will involve the building of a bridge across the Grand River in Dunnville. (Sept., pg. 418.)

Intercolonial Ry.—The ratepayers of Moncton, N. B., voted Aug. 31, on the agreement proposed to be entered into between the city council and the I. R. C. relative to the elimination of level crossings in the city, and approved by a majority of 434. The agreement will now be finally approved by the City Council, and the Department of Railways. It is expected that an announcement will be made on an early date as to when the work will be put in hand.

Tenders are under consideration by the Department of Railways for the works at the new steamship shed no. 2, in connection with the Halifax ocean terminals. (Sept., pg. 418.)

Lake Huron and Northern Ontario Ry.—We are officially advised that a contract for the extension of the old 17 mile line from Bruce Mines, Ont., northerly, has been let to the Ontario Northern Construction Co. The contract covers the entire work to be done, and is on a percentage basis. No time is specified for starting work on a large scale, but it is hoped that it will be actually undertaken next spring. It is stated that preliminary work, however, will be gone on with, and that some of this is already in hand. We are officially advised that new ties have been put in, along the whole 17 miles of the original line, and that the entire distance has been reballasted. This work was necessary, as owing to the long time the line was not being operated while it was in the hands of the receiver of the Bruce Mines and Algoma Ry. it got into a badly run down condition. G. P. McCallum is President, and H. Appleton, Vice President and General Manager, Bruce Mines, Ont. (July, 1913, pg. 33?.)

Miramichi Bay Shore Ry.—Press reports state that engineers have completed a survey for this projected railway from Newcastle to Tracadie, N. B., where connection would be made with the Caraquet and Gulf Shore Ry. (May, pg. 214.)

Pacific Great Eastern Ry.—The Minister of Railways for British Columbia has authorized the opening for traffic of the line from Lonsdale Ave., North Vancouver, to Horse Shoe Bay or Whitecliffe, 12.7 miles. The line is under construction from this point to Squamish, and is in operation for nearly 20 miles out of that place, and tracklaying is being proceeded with in the direction of Lillooet, 120 miles from Squamish, to which point grading is fully completed. The track laying and ballasting on this section is expected to be completed by Dec. 30.

J. W. Stewart, President, and P. Welch, representing the general contractors, completed a trip of inspection over the work, Sept. 8. The former is reported as stating that the company is well supplied with funds, and that, provided men can be obtained, the construction gangs will be increased.

The Minister of Railways has approved of route map for a branch line from near Fort George, to the vicinity of Davie Lake. (Sept., pg. 419.)

Pacific, Peace River and Athabasca Ry.—We are officially advised that the engineers in charge of the parties engaged in making surveys for this projected railway from the Naas River, B. C., to Prince Albert, Sask., as stated in our September issue, are:—Messrs. Wilson, Glover, Devey, Hunt, and Crawley. The company has not yet appointed a chief engineer.

Press reports state that about half the initial survey work has been completed, and that it is expected to have the whole route gone over by Nov. 30, and the office work on the reports completed so that the real work of locating the route may be started in the spring. (Sept., pg. 419.)

Pere Marquette Rd.—Press reports state that officials from Detroit, Mich., were in Sarnia, Ont., Sept. 15, arranging with the city council for the erection of a new station. It is stated that the city will provide a site on Clifford St., and that building operations will be started at once. (July, pg. 324.)

Van Buren Bridge Co.—The Board of Railway Commissioners has approved of location plans for the line for this company from the terminus of the International Ry of New Brunswick, in St. Leonard, N. B., to the International Boundary, in the middle of the St. John River, one mile. The State of Maine has approved of the location plans for the bridge and approach on the Maine side of the river in Van Buren, and for its connection with the Bangor and Aroostook Rd. R. Payson, 120 Exchange St., Portland, Me., is President. (Sept., pg. 419.)

Western Dominion Ry.—A start is reported to have been made on a 10 mile section of this projected railway. This section extends from Millarville in the direction of Calgary, Alta., as far as Priddis. Three routes have been located between this point and Calgary, but it had not been decided, Sept. 10, which one would be finally adopted. (Sept., pg. 419.)

Winnipeg.—The Commissioners of the Greater Winnipeg Water District have under consideration tenders for the supply of 8,000 ties for delivery at the terminus of its railway under construction, at Indian Bay, Shoal Lake, Man.

H. Reynolds, Chief Commissioner, returned to Winnipeg, Sept. 10, after a trip of inspection over the work in progress. Track has been laid as far as the Brokenhead River, and the grading work beyond is so far advanced that it is expected to have the line completed by Nov. 30.

It was reported at the meeting of the Commissioners, Sept. 11, that the railway was being operated from St. Boniface to the Brokenhead River, for the transportation of supplies. Over half of the grading has been completed for the entire mileage to Shoal Lake; 29% of the track has been laid, 6% of the ballasting done, and the residences for the divisional engineers at Deacon, Man., have been completed. Tenders for switches and frogs, from the Manitoba Bridge and Iron Works has been accepted. There have been delivered on the right of way 97% of the ties required, and 84% of of the steel rails, with large quantities of other construction supplies. (Sept., pg. 419.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Approval of C.P.R. Standard Freight Tariff.

22412. Aug. 17. Re application of C.P.R., under sec. 327 of the Railway Act, for approval of its Standard Freight Tariff, C.R.C. no. W. 1948, effective Sept. 1, to apply between its stations and ports of call in Ontario west of and including Port Arthur, Manitoba, Saskatchewan, Alberta and British Columbia. It is ordered that said tariff be approved.

Dock Facilities at Michipicoten, Ont.

22454. Aug. 14. Re application of Dominion Transportation Co., under sections 284 and 317 of the Railway Act, for an order directing the Algoma Central Ry. to permit the applicant company to continue to make use of the railway company's landing wharf or dock at Michipicoten, Ont. It is ordered that the railway company be directed to continue the use and maintenance of the said wharf facilities at Michipicoten to accommodate the traffic offering at that point. That Supplement 2 to Tariff C.R.C. no. 114 issued by the railway company May 1, 1913, effective June 5, 1913, be disallowed; and the railway company is directed to restore Tariff C.R.C. no. 114 issued April 8, 1911, effective April 24, 1911; the said restored tariff to become effective not later than Sept. 1, 1914.

Approval of G.T.P.R. Standard Freight Mileage Tariff.

22474. Re application of Grand Trunk Pacific Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Mileage Tariff, C.R.C. no. 22, applying between its stations in Ontario, Manitoba, Saskatchewan and British Columbia. It is ordered that the said tariff be approved.

Great Northern Railway Lines in Canada.

Vancouver, Victoria and Eastern Ry. and Navigation Co—Track laying is reported to be in progress beyond Coalmount to Brooks, B.C., where connection is made with the Kettle Valley Line, 27 miles, and it is expected to have the work completed early in October.

The new station building at New Westminster, for which plans have been submitted to the City Council, will be situated about 200 ft. from the present structure. It will be 72 by 32 ft., with an overhanging roof. The platform will be 200 by 12 ft. Work is reported to have been started.

Fraser River Bridge.—The British Columbia Government has for some time been carrying out considerable repair work on this bridge, over which the G.N.R. trains are run. The floor has been relaid and heavier steel is being laid in view of the increasing traffic. Repairs are also being made to the roadway, and the bridge is being repainted. (Aug., pg. 374.)

The Western Canada Railway Club has elected Louis Kon, Immigration Agent, Grand Trunk Pacific Ry., as Secretary, to succeed W. H. Rosevear, who resigned on his removal to Montreal. L. Lowe, of the C.P.R. Freight Department, has been elected Treasurer.

The employes of the four leading Canadian railway systems, the Canadian Government Railways, Canadian Northern, Canadian Pacific and Grand Trunk (including the G.T.P.R.) have arranged to contribute a day's pay to the Canadian Patrotic Fund.

National Transcontinental Railway Construction.

Press reports state that it is expected to have all the finishing work on the Moncton-Levis section of the line cleared up early in October. The car ferry terminals at Levis and Quebec are practically finished, and as the ferry has arrived, everything is nearly in order for the opening up of the line right into Quebec, where construction work is in progress on the station building, on the Champlain Market site, for the foundation work of which the contract was let to J. Gosselin, Levis.

We were officially advised, Sept. 17, that a contract had been let to Cavicchi and Pagano, for the construction of the Y at Cap Rouge, and the completion of the St. Malo line.

From Quebec to Cochrane, Ont., the finishing up work is still in hand, as also between Cochrane and Superior Jct. It is, however, so far advanced that it is expected to get everything through by the end of the year.

The question of the operation of the entire line by the Grand Trunk Pacific Ry. is being considered by the Department of Railways. (Aug., pg. 367.)

Grand Trunk Pacific Railway Construction

E. J. Chamberlin, President, left Montreal, Sept. 15, on a trip of inspection right through to Prince Rupert, B.C. He was accompanied by J. E. Dalrymple, Vice President; J. A. Hutchison, Chief Medical Officer, and W. M. Macpherson, one of the directors, and was joined at Fort William by M. Donaldson, Vice President and General Manager. This is the first official trip to be made since the through passenger and freight service from Fort William, Ont., to Prince Rupert was inaugurated on Sept. 13. Up to that date the permanent service had ceased at Edmonton, the service west of that city being conducted in sections according to the state of completion reached by the line.

The last section of the line upon which the Board of Railway Commissioners authorized the operation of trains was from Prince George to Priestly, B.C., 131 miles. The traffic is at present being carried across the Fraser River at Prince George by a temporary bridge, but the permanent bridge is expected to be completed this year. When we received the last official advices the bridge had been completed to the tenth span from the east end, three spans remaining to be erected. The bridge is 2,658 ft. 10 ins. long between parapet walls, and consists of 10 spans of 200 ft. each, 2 spans of 250 ft. each and 1 lift span of 100 ft. The substructure consists of 12 piers and 2 abutments. The bed of the river is of hard clay, on which rest shallow beds of gravel silt and mud, through which the piers are carried through to a solid foundation. The tops of the piers are 4½ ft. across, the floor of the bridge having a width of 50 ft. providing for a roadway on either side of the railway tracks. The 250 ft. spans are at the east end, with a central span for the lift in the centre. These are over the main channel of the Fraser River, while the 9th span is over the main channel of the Nechako River.

On the branch lines the most important work in progress is the laying out of the terminals in Calgary, Alberta. The grading of the site of the old R.N.W.M.P. barracks is being rushed forward by the Wilson Construction Co., and the preparatory work for the erection of a freight shed, 400 ft. long, is being done by the McDougal-Forster Co. These sheds will face Ninth Ave., while the passenger station will face Eighth Ave. A 90 ft. turntable has already been put in position, and a locomotive house is in course of erection. Tracks are being laid in the freight and passenger yards as fast as grading is completed. (Aug., pg. 367.)

Railway Rolling Stock Notes.

The Intercolonial Ry. has received 4 steel pit cars, 75 tons capacity, from Eastern Car Co.

Canadian Explosives, Ltd., has received 1 two-way dump car from Canadian Car and Foundry Co.

The Acadia Coal Co., Stellarton, N.S., has received 100 composite mine cars from Eastern Car Co.

The Intercolonial Ry. is, we are officially advised, in the market for 8 sleeping cars and 4 or 5 first class cars.

The Pacific Great Eastern Ry. has received 40 forty ton steel underframe flat cars from Canadian Car and Foundry Co.

The Moncton and Buctouche Ry. has bought 1 locomotive, 1 first class passenger car and 1 combination baggage and smoking car from the Intercolonial Ry.

The C.P.R., between Aug. 15 and Sept. 15, received the following additions to rolling stock, from its Angus shops: 81 steel frame box cars, 10 refrigerator cars, 5 steel first class cars, 1 class G-1 and 2 class H-1 locomotives.

The Sydney and Louisburg Ry.'s private car Catalone, which is used by J. H. Plummer, President, Dominion Steel Corporation, Ltd., of which the S. & L.R. is a subsidiary, has undergone a thorough overhauling by National Steel Car Co. at Hamilton, Ont.

The Prince Edward Island Ry. received recently from the Intercolonial Railway 3 passenger cars and 1 baggage car, which were taken on scows from Mulgrave, N.S., to Charlottetown, where their standard gauge trucks were replaced by narrow gauge ones.

The Intercolonial Ry. has received 2 switching locomotives from Canadian Locomotive Co.; 10 Pacific type locomotives from Montreal Locomotive Works; 180 box cars, 80,000 lbs. capacity, and 4 special pit cars, 150,000 lbs. capacity, from Eastern Car Co.

The Intercolonial Ry. is building 4 baggage and 2 postal cars in its Moncton shops. They will have steel underframing with wood superstructure. The baggage cars will be 60 ft. long with Simplex 4-wheel trucks, and the postal cars will be 65 ft. long with Simplex 6-wheel trucks.

The C.P.R., between Aug. 15 and Sept. 15, ordered the following rolling stock: 7 refrigerator cars, 3 double track flangers, 4 single track flangers, from its Angus shops; 3 steel double track snow ploughs, 2 steel single track snow ploughs with long hoods, and 1 steel single track snow plough with short hood, from Canadian Car and Foundry Co.

The G.T.R. has received 1 suburban car, 2 suburban second class and baggage cars and 2 first class cars from Canadian Car and Foundry Co.; 3 baggage cars from National Steel Car Co.; 9 first class cars and 1 second class and baggage car from American and Foundry Co.; 6 dining cars, 5 parlor cars and 1 parlor-buffet car from Pullman Co.

Intercolonial Ry. Employes are giving one day's pay to the Canadian Patriotic Fund, the amounts to be deducted from the pay cheques received in October.

Mainly About Transportation People.

E. W. BEATTY, General Counsel, C.P.R., returned to Canada, Sept. 11, after a short business trip to London, Eng.

A. CATONI, agent, C.P.R., Paris, France, has closed the office there and removed to London, Eng., for the present.

JOHN McKAY, who died at Penticton, B. C., recently, was a superintendent of construction in the early days of the C. P. R. in British Columbia.

HUGH PATON, President, Shedden Forwarding Co., Montreal, and the company, have each subscribed $10,000 to the Canadian Patriotic Fund.

JOHN MIDDLETON, one of a Canadian Northern Ry. survey party, was killed near Lytton, B. C., recently by falling about 70 ft. from a ledge of rock.

Mrs. W. G. ANNABLE, wife of the General Passenger Agent, Atlantic Service, C. P. R., has returned to Montreal after spending the summer at Prout's Neck, Me.

C. J. Wainwright, son of the late WILLIAM WAINWRIGHT, President, G. T. R. and G. T. Pacific Ry., was married at Montreal, Sept. 2, to Miss M. E. D. Stafford.

JAMES WILSON, an engineer engaged on the Government railway to Hudson Bay, was drowned while endeavoring to shoot the Sheel Rapids on the Nelson River, Aug. 25.

J. J. WARREN, President, Kettle Valley Ry., who has made his home in Penticton, B. C., during the past two years, has returned to Toronto, where he will in future reside.

D. G. Goleman, son of D'ALTON C. COLEMAN, General Superintendent, Alberta Division, C. P. R., Calgary, died there, recently, aged 6.

H. E. SUCKLING, Treasurer, C.P.R., was present at the annual meeting of the Society of Financial Railway Officers, at Lenox, Mass., recently.

SIR THOMAS SHAUGHNESSY, K.C.V.O., with Lady and Miss Shaughnessy, returned to Montreal, Sept. 16, from their summer home at St. Andrews, N.B.

D. MEADOWS, Assistant Master Mechanic, Michigan Central Rd., St. Thomas, Ont., has been elected Treasurer of the Travelling Engineers' Association.

R. G. PRICE is Master Car Builder, Quebec Central Ry., not Car Foreman as mentioned in the article on the Q.C.R. shops at Sherbrooke, in our September issue.

Miss M. Forget, eldest daughter of SIR RODOLPHE FORGET, President, Quebec Ry., Light, Heat and Power Co., was married to A. Martin, at Ste. Irenee, Que., Sept. 9.

W. H. ELLIS, Professor of Chemistry, Faculty of Applied Science, Toronto University, has been appointed acting Dean of the Faculty, vice the late John Galbraith.

J. C. BITHELL, Assistant Bridge and Building Master, Angus Shops, C. P. R., Montreal, has joined the Canadian contingent now preparing for active service in Europe.

Miss Jean Mackenzie, niece of SIR WILLIAM MACKENZIE, was married at Quebec, Sept. 9, to Lieutenant W. K. G. Colquhoun, of the Princess Patricia Light Infantry.

SIR THOMAS TAIT, who spent the summer at Rockland, Me., returned to Canada early in September, when he visited Toronto, with Lady and Miss Tait, before returning to Montreal.

Lieut. Commander Bernard Harvey, of H.M.S. Cressy, which was sunk by a German submarine recently, was a son of the late A. W. HARVEY, who was the principal of one of the chief shipping firms at St. Johns, Nfld.

COLONEL JAMES MACDONNELL, a Vancouver contractor, has, with a few associates, undertaken to raise and equip a

P396 W. H. Ardley,
Comptroller, Grand Trunk Railway and Grand Trunk Pacific Railway.

P397 J. A. MacGregor,
Superintendent, District 4, Alberta Division, Canadian Pacific Railway.

mounted corps to be added to the Canadian overseas force.

D. POTTINGER, I.S.O., ex Deputy Chairman, Government Railways Managing Board, accompanied by Mrs. Pottinger, returned to Canada, Sept. 15, from a trip to Great Britain.

SIR WILLIAM MACKENZIE left Toronto, Sept. 16, on a business trip to Western Canada, and was expected to return by the end of the month. He was accompanied by Lady Mackenzie.

Miss Kate Reford, youngest daughter of the late ROBERT REFORD, of Robert Reford Co., shipping agents, was married at Montreal, Sept. 5, to W. H. Clark-Kennedy, of Knockgray, Scotland.

M. H. WESTBROOK of the G. T. R., Battle Creek, Mich., has been elected a member of the committee on shop efficiency, of the International Railway General Foremen's Association, for the current year.

W. S. COOKSON, Assistant General Passenger Agent, G.T.R., Montreal, attended the American Association of General Passenger and Ticket Agents convention, at Boston, Mass., Sept. 15 and 16.

C. DIXON, of the Comptroller and Treasurer's office, Intercolonial Ry., was presented at Moncton, N. B., Sept. 5, with several articles of furniture on the occasion of his marriage, which took place Sept. 8.

K. NAKAMURA, a Japanese civil engineer, in the service of the South Manchuria Ry., who is on a tour of the world, absorbing information on railway matters, completed a trip over the G.T.R. system recently.

Capt. J. M. EAKINS, Manager, Canada Grip Nut Co., St. Johns, Que., has sailed with the Canadian contingent to Europe, as officer in charge of the ammunition column of the second brigade.

CAPT. H. St. G. LINDSAY, Dominion Superintendent of Pilotage, Quebec, has been transferred temporarily to the Militia Department, to act as inspector of vessels and attend to other matters connected with military transport.

SIR WILLIAM VAN HORNE, K. C. M. G., returned to Montreal from St. Andrews, N. B., at the end of August. He is reported to have experienced considerable relief from the rheumatism, which troubled him for several months.

GEORGE H. HANNA, General Manager, Montreal Warehousing Co., Montreal, died suddenly while out walking, Sept. 13, aged 67. He had been associated with the company for about 45 years, having joined its service as a clerk.

LIEUT. WALLACE ROBB, of the Canuck Supply Co., Montreal, has been appointed provisionally to command the heavy battery ammunition column of the artillery unit in the overseas force, which has been assembled at Valcartier.

CAPT. T. C. IRVING, Jr., A.M. Can. Soc. C.E., Toronto, Vice President Robert W. Hunt & Co., Ltd., bureau of inspection, tests and consultation, has gone to the front in command of an engineer's corps, and two of his brothers have also gone.

PERCY WILGER, latterly Assistant District Engineer, National Transcontinental Ry., Cochrane, Ont., is reported to have been appointed Professor of Civil Engineering at Queen's University, Kingston, Ont., succeeding the late A. K. Kirkpatrick.

M. J. HAYES, General Foreman, Toronto, Hamilton and Buffalo Ry., Hamilton, Ont., has been elected a member of the committee on rods, tires, axles and crank pins, of the International Railway General Foremen's Association, for the current year.

T. J. HUTCHINSON, Foreman Painter, G. T. R., London, Ont., was elected President of the Master Car and Locomotive Painters' Association of the United States and Canada, for the current year, at the annual convention at Nashville, Tenn., Sept. 8.

COL. W. P. ANDERSON, Chief Engineer, Department of Marine, was in Victoria, Sept. 9, on his annual trip of inspection of the works under the Department's control. On the following day he proceeded to Prince Rupert and other northerly points.

The partnership between JAS. A. MACDONELL and C. S. GZOWSKI, of Vancouver, B. C., railway and general contractors, has been dissolved by mutual consent. The firm's obligations will be discharged by Mr. Gzowski, who will carry on business on his own account.

Among the junior officers of the H.M.S Berwick, which recently captured a German cruiser in the North Atlantic, are V. Brodeur, son of Hon. L. P. Brodeur, a former Minister of Marine; and D. St. George Lindsay, son of Capt. H. St. G. Lindsay, Superintendent of Pilots, Montreal.

R. J. PARKE, M. Can. Soc. C. E., who died at Toronto recently, after several weeks illness, acted as consulting engineer to the Dominion Government in connection with the lighting of the Welland Canal. He was also associated with the Canada Wire and Cable Co., Toronto, and the British Aluminium Corporation.

Dr. B. L. RIORDAN, who died at Toronto, Aug. 29, aged 55, was for 15 years, Divisional Surgeon for Ontario for the G. T. R., and had also been for several years, Chief Surgeon for the Toronto and York Radial Ry. He was a former President of the International Railway Surgeons of America.

W. E. REDWAY, who died at Toronto, Sept. 19, was born in England, entered the shipbuilding business early in life, and was elected a member of the Institute of Naval Architects in 1884, in which year he came to Canada. He was for many years associated with the Doty Engine Co. and the Polson Iron Works, and was practising as a consulting naval architect laterly.

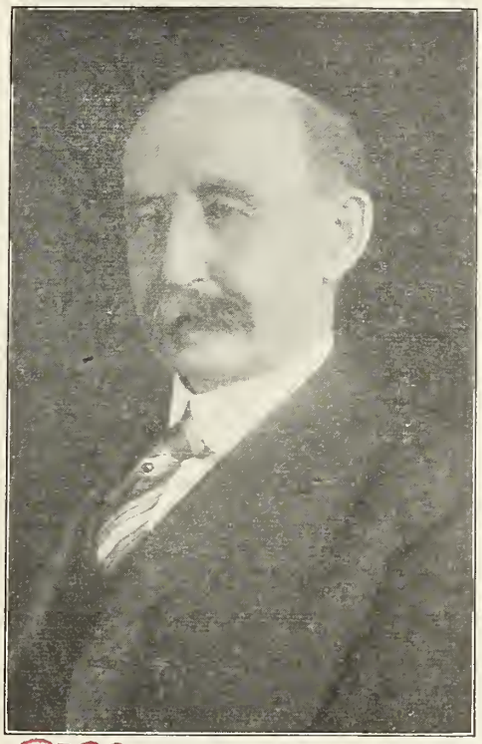
SIR JOHN GIBSON, whose term of office as Lieutenant Governor of Ontario, which was extended for a year, has now terminated, is a large stock holder in and one of the directors of the Dominion Power and Transmission Co., which owns the Hamilton St. Ry. and the various suburban lines radiating from Hamilton. He is President of the National Steel Car Co., Hamilton.

The estate of the late WILLIAM WAINWRIGHT, Vice President, G. T. R., and G. T. Pacific Ry., Montreal, has been probated at $496,247, of which $291,057 is in stocks. Other items include life insurance $36,434; cash $47,070; bonds $84,000. The estate is divided amongst six sons and four daughters. Probate has also been entered in England covering estate there, valued at £301.

SAMUEL McELROY, who was appointed Trainmaster, Canadian Northern Ry., Rainy River, Ont., recently, was born at Lindsay, Ont., May 1, 1875, and entered railway service May 1, 1900, since when he has been, to July 31, 1902, fireman G.T.R., Lindsay, Ont.; Nov. 16, 1902, to Nov. 3, 1905, brakeman, Canadian Northern Ry., Winnipeg; Nov. 3, 1905, to June 30, 1914, conductor, same road, Rainy River, Ont.

A. G. CLARK, accountant. HENRY KINGSCOTE, cashier, and H. KINGSCOTE, accountant's assistant, of the C. P. R. staff at Vienna, Austria, were, on the outbreak of war between Great Britain and Austria, arrested and imprisoned, but were subsequently released through the intervention of the United States Embassy. They are, apparently, still in Austria, having been sent with farmers to assist in gathering the crops.

A. J. IRONSIDES, who has been appointed District Master Mechanic, C. P. R., Edmonton, Alta., entered C. P. R. service as a wiper at Montreal in 1901. He has been, from Nov. 1902 to Aug. 1906, fireman; Brandon, Man.; Aug. 1906 to June 1907, locomotive driver, Brandon, Man.; June to Dec. 1907, locomotive driver, Kenora, Ont.; Dec. 1907 to Apr. 1908, locomotive driver, Schreiber, Ont.; Apr. 1908 to Feb. 1909, locomotive driver, Brandon, Man.; Feb. 1909 to Aug. 1912, locomotive driver, Sutherland, Sask.; Aug. 12, 1912 to Aug. 1, 1914, District Master Mechanic, Saskatoon, Sask.



P398 H. A. Woods,
Assistant Chief Engineer Grand Trunk Pacific Railway.

P399 James A. Yates,
Assistant Treasurer, Grand Trunk Railway and Grand Trunk Pacific Railway.

CHARLES THOMAS RIDALLS, whose appointment as Car Foreman, C. P. R., London, Ont., was announced in our last issue, was born at St. Heliers, Jersey, Channel Islands, Feb. 8, 1864, and was, from May 1886 to Dec. 1890, car repairer, Michigan Central Rd., St. Thomas, Ont.; Dec. 1890 to Oct. 1, 1904, car builder, same road, St. Thomas, Ont.; Oct. 1, 1904 to May 29, 1905, Car Foreman, same road, St. Thomas, Ont.; June 1, 1905 to Oct. 1, 1908, Assistant Car Foreman, Angus Shops, C. P. R., Montreal; Oct. 1, 1908 to July 23, 1914, Car Foreman, C. P. R., McAdam Jct., N. B.

LT.-COL. THE HON. J. S. HENDRIE, C.V.O., M.L.A. for West Hamilton, and a member of the Ontario Government without portfolio, who has been appointed Lieutenant-Governor of Ontario, is a son of the late Wm. Hendrie, of Hamilton, who founded the Hendrie Cartage Co., and was engaged in contracting for many years. Col. Hendrie, who was born Aug. 13, 1857, is President of the Hamilton Bridge Works, has been a member of the Hydro Electric Power Commission of Ontario since its establishment and has been several years chairman of the Ontario Legislature's railways committee.

SIR STEPHEN W. FURNESS, who died in England, Sept. 6, aged 42, as the result of a fall from an hotel window, was a member of the London Advisory Board of Canada Steamship Lines, Ltd., and a director of Furness Withy and Co., Ltd., which carries on a general navigation business with various parts of the world, including Canada. He was also associated with the British Maritime Trust, Ltd., which controls a large investment in Canada Steamship Lines, Ltd., and was connected with many other navigation, shipbuilding and iron companies. He was a nephew of the late Lord Furness, a former Honorary President of the Richelieu and Ontario Navigation Co., now Canada Steamship Lines, Ltd.

D. MORICE, freight and customs agent, G. T. R., Niagara Falls, Ont., completed 50 years service with the company on Sept. 3. His staff decorated his office with flowers and flags, and H. G. Kelley, Vice President, and other prominent officials, who were on an inspection tour, called and congratulated him. He was born at Brantford, Ont., where he started railway work as messenger in the Superintendent's office, gradually rising to chief clerk. In 1870 he was transferred to the Superintendent's office at Stratford, and in 1879 was appointed passenger and freight agent there. In 1885 he was transferred to Niagara Falls, remaining there until Oct., 1891, when he was appointed Division Superintendent of the Southern Division at London. From Nov. 1892 to July 1896 he was Superintendent of the Middle Division at London, and then Terminal Superintendent at Toronto until July 1896, when on account of ill health he was transferred to his present position at Niagara Falls.

J. A. BOSWELL, who died at Long Beach, California, Sept. 4, was born at Columbus, Ohio, Dec. 23, 1840, and entered transportation service in 1861, with the Pennsylvania Rd. He entered express service in 1865, with the United States Ex. Co., and came to Canada, May 1, 1888, joining the Dominion Ex. Co., since when he was, to June 1, 1889, Assistant Superintendent, Toronto; June 1, 1889, to Sept. 1, 1903, Superintendent, Ontario Division, Toronto; Sept. 1, 1903, to June 30, 1912, Superintendent, Eastern Division, Montreal. After his retirement on the latter date, he spent much of his time in California. His body was brought to Toronto, the funeral taking place from the house of his son in law, W. H. Burr, Auditor, Dominion Ex. Co., the pall bearers all being officers of the company, viz.:—W. S. Stout, President; V. G. R. Vickers,

General Superintendent, Eastern and Atlantic Divisions; W. Walsh, General Superintendent, Ontario Division; G. Ford, General Superintendent, Western Division; J. J. Murray, Superintendent, Toronto; H. P. Sharpe, General Agent, Toronto. Mr. Boswell is survived by his widow, by one daughter, Mrs. W. H. Burr, Toronto, and one son, Arthur. Boswell, Route Agent, Dominion Ex. Co., Hamilton, Ont.

Hospital Cars on the Canadian Northern Railway.

The Canadian Northern Ry. has equipped two of its cars for service as a hospital unit in conjunction with the Canadian military concentration camp at Valcartier. One is a standard colonist car, used as the ward, and the other is a baggage car, used as the hospital commissary. Both cars are now in service at Valcartier, Que., where they are located on a camp siding.

The interior of both cars has been painted white, having been given three coats of a hard drying highest grade enamel. The floor is of a sanitary material, fitted with hospital corners to allow for flushing with hose and water, and is covered with carpet. The finish throughout is flush and easily cleaned.

The colonist car is 72½ ft. long over body, of the standard C.N.R. type, and contains 18 sections, providing accommodation for 36 patients in the upper and lower berths. There is a small kitchen at one end of the car, which is to be used as the hospital kitchen, and across the aisle from this kitchen section is a small baggage storing space. This end of the car in the ordinary colonist car also contains the women's toilet and lavatory, and at the other end the men's lavatory and heater room. This provides a double lavatory accommodation for the hospital. The car is equipped with suitable bedding, including mattresses, sheets, pillows, pillow cases, pillow slips, blankets, headboard curtains, berth curtains, etc. Electric light, with dynamo and storage battery auxiliary, have been applied, using 10 c.p. lamps. Each window is fitted with an air intake ventilator, such as is standard for all C.N.R. cars, and in addition 12 automatic exhaust ventilators have been applied in the deck. Water is supplied by an air pressure gravity system, such as is in use on C.N.R. equipment. Combination hot water heating is used, so arranged as to operate independently as a unit, or receive steam from an outside source. The changes in the car were made at the Crossen Car Co.'s works, Cobourg, Ont.

The hospital commissary car is a standard 60 ft. baggage car, provided with electric light, steam heat, etc., as in the other car. It is used as a local hospital commissary and office car for the medical attendants. It is also possible that it may be used as an operating car, as the military authorities are making internal changes in its arrangement.

While it would be possible to use the hospital car as a transport for taking serious cases into the base hospital, in Quebec, up to the time of writing it was being used as a purely local unit, standing on one of the camp sidings. Both cars are marked on the outside with the red cross.

Hospital Ward Car and Commissary Car, Canadian Northern Railway.

The British Railways and the War.

The Imperial Government, under the provisions of the Regulation of the Forces Act, 1871, passed an order in Council, Aug. 4, declaring that it was expedient that the Government should have control over all the railways within Great Britain and Ireland. Following is a copy of a typical circular notifying the public of this movement. It was issued by the General Manager, Great Western Ry., and reads as follows:—"The Government have, for the time being, taken over the control of the railway in connection with the mobilization of the troops and general movements in relation to naval and military requirements. The management of the railway and the existing conditions of employment of the staff will remain unaltered, and all instructions will be issued through the same channels as heretofore."

The actual working of the various lines under the new conditions is vested in a committee of general managers, representing the following great trunk lines:—Caledonian, Great Central, Great Northern, Great Western, London and Northwestern, Lancashire and Yorkshire, London and Southwestern, Midland, North Eastern, South Eastern and Chatham, London, Brighton and South Coast, the official chairman being the President of the Board of Trade, representing the Cabinet, and the active chairman is the General Manager of the London and Southwestern Ry.

The object in view was to provide adequate facilities for the movement of troops and the carrying of supplies to the seaboard for shipment to the seat of war. While this Government traffic has the preference under the new conditions, the committee has been able to maintain practically the previously existing services almost in their entirety. There have been from time to time dislocations of the services on certain lines, but they have been only temporary. The committee of general managers are all members of the Engineer and Railway Staff Corps, which was first formed in 1865, and became part of the Royal Engineers of the Territorial Force in 1908. This corps has been for years working out all the necessary details for such an emergency as this, and it is due to the investigations made in the past that the railways have been able to render such efficient service as they have done.

The statistics show that 23,718 running miles of railway are affected, owning 22,998 locomotives, 72,888 passenger cars, and 780,520 freight cars of all kinds. It is estimated that over 20,000 men employed upon the railways have left their employment to join the colors. Their places have been filled in most cases by promotions all along the line, and by taking on untried men and boys in the lower ranks. The companies are making provisions for the families left, by the payment of allowances during the absence of the men, and by providing pensions for those killed, and will provide positions for those who return.

One very notable thing accomplished is the provision of a complete hospital train by the Great Eastern Ry. It consists of eight 50 ft. bogie class cars, and one 48¼ ft. car. One car contains compartments for nurses, doctors, attendants, stores and pantry; another contains a treatment room and pharmacy, and a third contains the guard's compartment, stores, etc. The remaining space contains beds for 120 patients.

Passenger Rate Advances in the United States.

Eastern railways in the United States have filed with the Interstate Commerce and the respective State Commissions notices that beginning Oct. 1, the charge for open and interchangeable mileage books will be at the rate of 2¼c. per mile instead of 2c., as heretofore. This increase is made to carry out the suggestion of the I.C. Commission that additional revenue "demanded," as the Commission says, "in the interest of both the general public and the railways," should be obtained by carriers in trunk line territory by other than increases in freight rates.

In its decision in the 5% advance freight rate case the Commission found that there had been a very general and substantial increase in railway expenses, the Commission saying: "It is probable, in the case of every railway showing a largely increased operating ratio, that the increased ratio is due, in a large measure, to its passenger service." Although there has been no increase in passenger rates, there has for many years past been a constant improvement in passenger service. Very large expenditures have been made necessary to provide steel cars, improved stations, automatic signals, and other features which have added so pronouncedly to the comfort, safety and convenience of passengers.

A Concord, N.H., dispatch of Sept. 23 says the New Hampshire Public Service Commission has refused applications of the G.T.R. and Boston and Maine Rd. to increase passenger fares from 2 to 2¼c. per mile in those states.

The Moncton and Buctouche Ry. has made an arrangement with the Intercolonial Ry. for the use of the latter's passenger station at Moncton, N.B. Moncton and Buctouche Ry. trains, which formerly had their southern terminal at the company's station in the east end of Moncton, now depart from and arrive at the I.R.C. station and run over the I.R.C. between Moncton and Humphreys, about 2 miles east of Moncton, where there is a junction with the M. & B.R.

The G.T.R. employes in Montreal are contributing one day's pay, amounting to about $12,000, to the local branch of the Canadian Patriotic Fund. Similar gifts are being arranged for at various traffic centres along the lines, the money to be donated through the Local Patriotic Funds Organization. With the G.T.P.R. employes' co-operation, the contributions by the officers and general staffs will probably amount to nearly $100,000.

Col. Alex. Bertram, of the John Bertram and Sons Co., Dundas, Ont., and Thomas Cantley, General Manager, Nova Scotia Steel and Coal Co., New Glasgow, N.S., are members of a Government commission appointed to enquire into the feasibility of manufacturing, in Canada, shells for British field artillery.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canada Steamship Lines, Ltd.—H. FOSTER CHAFFEE, Passenger Traffic Manager, having resigned, the position has been abolished for the present. JOHN F. PIERCE, Assistant General Passenger Agent, will have jurisdiction over all matters pertaining to passenger business, reporting to W. E. Burke, Assistant Manager. Office, Montreal.

Canadian Northern Ry.—J. W. FINDLAY, heretofore General Foreman, Parry Sound, Ont., has been appointed Road Foreman of Locomotives there.

O. GRANT has been appointed General Foreman, Parry Sound, Ont., vice J. W. Findlay.

Canadian Pacific Ry.—H. C. GROUT, heretofore acting General Superintendent, Atlantic Division, has been appointed General Superintendent, vice W. Downie, who has been on 12 months leave of absence, and who has now retired from the company's service. Office, St. John, N.B.

J. K. McNEILLIE, Superintendent, District 2, Eastern Division, has been appointed acting General Superintendent, Eastern Division, during the absence of G. Hodge on leave of absence. Office, Montreal.

J. C. BITHELL, Assistant Bridge and Building Master, Angus Shops, Montreal, has joined the Canadian contingent for active service in Europe. We were advised, Sept. 8, that no appointment of a successor had been made.

W. COULTER has been appointed Assistant Superintendent, Montreal Terminals.

A. LINDSAY, heretofore Assistant Yardmaster, Fort William, Ont., has been appointed General Yardmaster there, vice A. F. Hawkins, appointed Trainmaster at Medicine Hat, Alta., as announced in our last issue.

W. J. RENNIE, heretofore assistant chief clerk to Assistant Freight Traffic Manager, Winnipeg, has been appointed chief clerk, vice K. Elliott, promoted.

C. G. WASHBON, heretofore Trainmaster, Souris, Man., has been appointed Trainmaster, Brandon, Man., vice H. E. Haanel.

J. N. MURPHY has been appointed Trainmaster, Souris, Man., vice C. G. Washbon, transferred to Brandon, Man.

H. E. HAANEL, heretofore Trainmaster, Brandon, Man., has been appointed Trainmaster, District 1, Saskatchewan Division, vice J. H. McDiarmid. Office, Regina.

R. F. CHAPMAN, heretofore Chief Dispatcher, District 3, Saskatoon, has been appointed Chief Dispatcher, District 1, Saskatchewan Division, vice R. R. Jelly. Office, Regina.

J. H. SCOTT has been appointed Chief Dispatcher, District 3, Saskatchewan Division, vice R. F. Chapman, transferred. Office, Saskatoon.

G. F. BURGESS, formerly Road Foreman of Locomotives, Macleod, Alta., and latterly acting as District Master Mechanic, Cranbrook, B.C., during the absence of G. Glasford on leave, has been appointed Road Foreman of Locomotives, Medicine Hat, Alta., vice E. J. Lemieux, whose appointment as District Master Mechanic, Lethbridge, Alta., was announced in our last issue.

W. E. HAYWARD, heretofore Roundhouse Foreman, Vancouver, B.C. has been appointed Night Roundhouse Foreman at Alyth, Calgary, Alta.

A. J. IRONSIDES, heretofore District Master Mechanic, Saskatoon, Sask., has been appointed District Master Mechanic, Edmonton, Alta.

A. MALLINSON, heretofore District Master Mechanic, Nelson, B.C., has been appointed District Master Mechanic, Cranbrook, B.C., vice G. Glasford.

E. C. OVIATT, Travelling Passenger Agent, Battle Creek, Mich., has had his office moved to 7 Fort St. West, Detroit, Mich., the Battle Creek office having been closed.

J. V. MURPHY, heretofore District Passenger Agent, Nelson, B.C., has been appointed General Agent, Portland, Ore.

Central Vermont Ry.—FRANK SCOTT, Vice President and Treasurer, G.T.R. and G.T. Pacific Ry., has also been appointed Vice President in charge of finances, C.V.R., vice M. M. Reynolds, deceased. Office, Montreal.

Duluth, South Shore and Atlantic Ry.—J. A. MICHAELSON has been appointed District Freight Agent, Grand Rapids, Mich., vice M. C. Kimball, deceased.

Esquimalt and Nanaimo Ry.—T. S. WILSON, heretofore Assistant Roadmaster, has been appointed Roadmaster, vice W. Newman, deceased. Headquarters, Victoria, B.C.

Grand Trunk Pacific Ry.—H. A. WOODS has, as Assistant Chief Engineer, been appointed in charge of the Engineering Department, vice B. B. Kelliher, Chief Engineer, resigned. Office, Winnipeg.

The following station agents have been appointed:—Bashaw, Alta., J. R. White; Endako, B.C., R. A. Pake. The station at Tete Jaune, B.C., has been closed.

Grand Trunk Ry.—G. A. HARRISON, heretofore Soliciting Passenger Agent, Montreal, has been appointed City Passenger and Ticket Agent, Sherbrooke, Que.

A. T. FOLGER, Manager, Chateau Laurier Hotel, Ottawa, has resigned, and will be associated with the management of the Olympia, a new hotel in Winnipeg.

Dr. GORDON RICE has been appointed Division Surgeon, Ontario Lines, succeeding his late partner, Dr. B. L. Riordan. Office, Toronto.

A. E. PERNFUSS, heretofore acting City Passenger and Ticket Agent, Berlin, Ont., has been appointed City Passenger and Ticket Agent there, vice G. D. LaCourse, deceased.

The following station agents have been appointed:—Tottenham, Ont., C. H. Harvey; Toronto (Exchange, passenger), H. S. Wood; Sarnia Tunnel, Ont., passenger, W. R. Clements; Blair, Ont., R. W. Loftus; Sarnia, Ont., freight, G. A. Bond; Chatham, Ont., A. Dewar; Windsor, Ont., J. C. Pritchard; Brule Lake, Ont., K. N. Cameron.

F. J. McKEE, heretofore acting Superintendent Terminals, has been appointed Superintendent Terminals, Port Huron, Mich., vice J. F. Jones who asked to be relieved on account of ill health.

Minneapolis, St. Paul and Sault Ste. Marie Ry.—J. A. MICHAELSON has been appointed District Freight Agent, Grand Rapids, Mich., vice M. C. Kimball, deceased.

Pere Marquette Rd.—F. W. BLAIR, one of the three receivers, has resigned.

American Association of General Passenger and Ticket Agents.—The 59th annual convention was held at Boston, Mass., Sept. 15 and 16. The name was changed to the American Association of Passenger Traffic Officers, this being considered as more applicable to present conditions. G. Fort, Passenger Traffic Manager, Union Pacific Rd., Omaha, Neb., was elected President, and A. Hilton, Passenger Traffic Manager, St. Louis and San Francisco Rd., St. Louis, Mo., Vice President, for the current year.

Halifax Ocean Terminals, Intercolonial Railway.

The work to be done under the contract for which tenders are under consideration by the Department of Railways, for the pier and shed no. 2 on the ocean terminals at Halifax, N.S., covers the erection of a pier with sheds thereon, and is part of the first unit to be completed. Full details of the general lay out of the terminals with plans were given in Canadian Railway and Marine World, June, 1913, pg. 265; Sept., 1913, pg. 421; Oct., 1913, pg. 462, and Nov., 1913, pg. 535.

The pier will be 2,000 ft. long, with a 45 ft. depth of water at low tide. Four lines of railway tracks will be laid on the pier one on each side of the shed and two running through the centre. The shed will be over 700 ft. long; the greater part of the lower floor will be open for the handling of baggage to and from the trains and steamships. At the shore end of the building will be the various offices for receiving and examining baggage and storing the same, and customs offices. The trains will run alongside the steamships on both sides of the pier, and the lower floor will have ample connections with the upper floor for the convenience of passengers.

The upper floor will be devoted entirely to the immigration traffic. At the water end the first section will contain the steerage quarters with offices for the medical officers, Canadian and U.S. immigration officers, detention rooms, etc. The waiting room, where the division of the passengers will take place, will have an area of 1,400 sq. ft. There are to be two main steerage assembly rooms, separated by passageway 10 ft. wide, each 162 by 54 ft., giving a floor area of 8,400 sq. ft. Next to the steerage waiting room will be the booking hall, and then the area set apart for first and second class passengers. In this section will be provided offices for the workers of the various church agencies, the Salvation Army and the Nova Scotia Immigration department. In the rear of this will be a general waiting room, with customs offices and detention room for Chinese. The shore end of the buildings will contain offices and quarters for the permanent immigration staff, on the one side, and on the other a dining room, 75 ft. by 36 ft. A space 49½ ft by 504 ft. long on either side of the building will be devoted to baggage purposes, and will be connected by chutes to the lower floor. From the inside of the various sections stairway accommodation to the lower floor will be provided.

The buildings are to be roofed with concrete, and the partitions are to be of 4 and 6 in. terra cotta, and 3 by ⅞ in. boards on one side of 4 by 3 in. dressed scantlings on the upper floor, and of terra cotta blocks on the lower floor.

J. Kennedy, Montreal, is Consulting Engineer for the Department for the entire work, and A. F. Dyer is Resident Engineer in charge.

Canadian Ticket Agents' Association.—In connection with the annual outing to be held at Chicago, Oct. 6 to 8, Chicago representatives of railways operating in Canada have formed a reception committee composed of C. G. Orttenburger, G.W.P.A., Canadian Government Railways; G. A. Walton, G.A.P.D., Canadian Pacific Ry.; J. D. McDonald, A.G.P.A., Grand Trunk Ry.; C. C. Clark, G.A.P.D., Michigan Central Rd., and F. H. Tristram, A.G.P.A., Wabash Rd. G. W. Vaux, G.A.P.D., Union Pacific System, and formerly of the G.T.R., is secretary-treasurer of the committee.

Electric Railway Department

The Car Barns on the Toronto Civic Railway.

The eastern and western divisions of the Toronto Civic Ry., which the city is operating in its outlying districts, on Gerrard St., and Danforth Ave., and St. Clair Ave. respectively, are so separated from each other that independent means of handling the equipment on each line are required. When the system was described in Canadian Railway and Marine World for Oct., 1913, there existed only one barn, that on the Gerrard St. line, near its eastern terminus, which was briefly referred to. It consists of a light frame structure, sheathed with galvanized iron, and partakes of the nature of a temporary expedient until the proposed permanent barn may be built. Since then, a permanent building of modern design has been built for the St. Clair Ave. line, and has been in service since last spring, while for the Gerrard St. and Danforth Ave. lines, plans have been prepared for barns larger than the St. Clair Ave. one, and tenders have been invited.

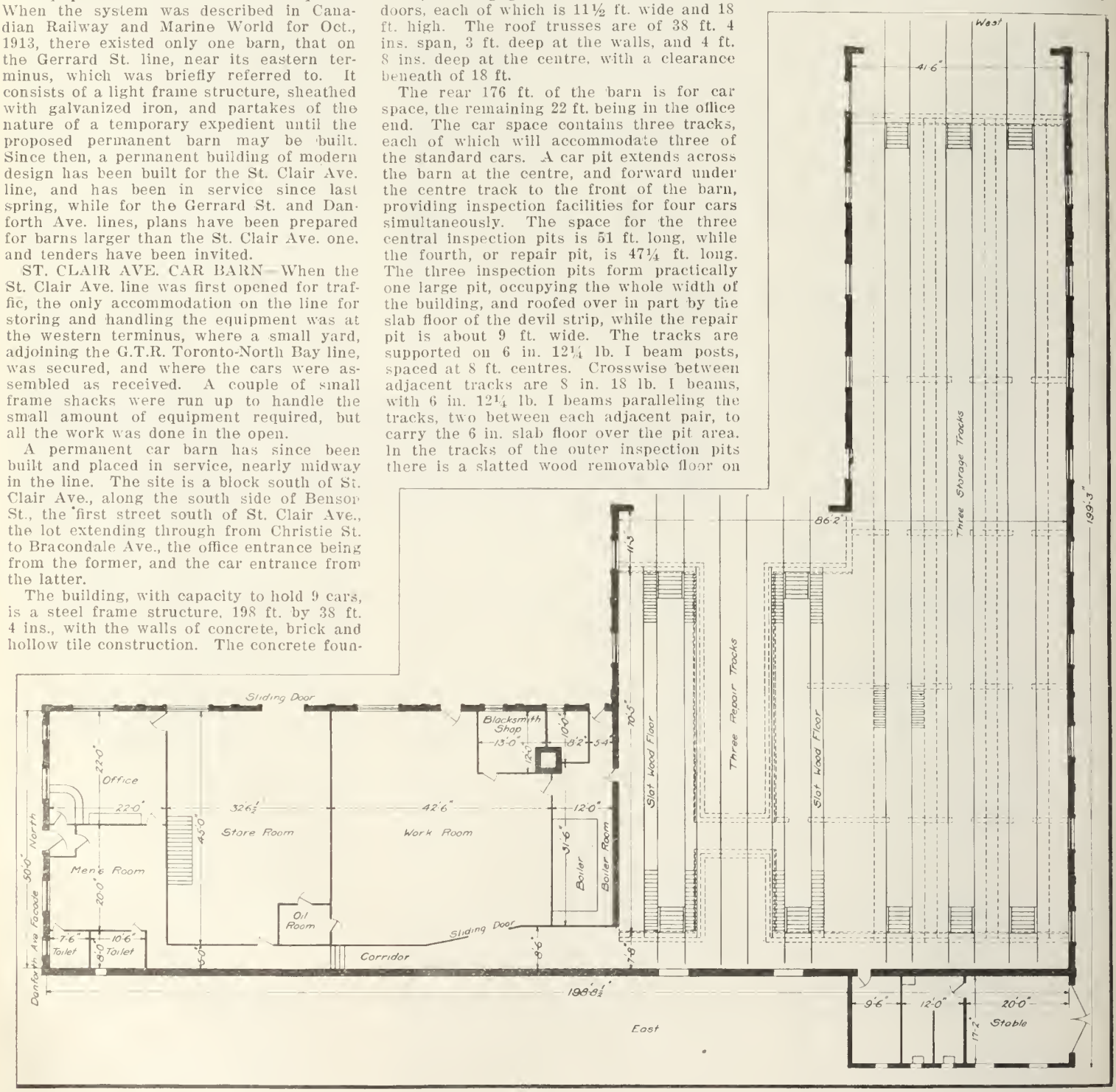
ST. CLAIR AVE. CAR BARN—When the St. Clair Ave. line was first opened for traffic, the only accommodation on the line for storing and handling the equipment was at the western terminus, where a small yard, adjoining the G.T.R. Toronto-North Bay line, was secured, and where the cars were assembled as received. A couple of small frame shacks were run up to handle the small amount of equipment required, but all the work was done in the open.

A permanent car barn has since been built and placed in service, nearly midway in the line. The site is a block south of St. Clair Ave., along the south side of Benson St., the first street south of St. Clair Ave., the lot extending through from Christie St. to Bracondale Ave., the office entrance being from the former, and the car entrance from the latter.

The building, with capacity to hold 9 cars, is a steel frame structure, 198 ft. by 38 ft. 4 ins., with the walls of concrete, brick and hollow tile construction. The concrete foundation extends to a depth of 4 ft., with a 14 in. brick wall, 4½ ft. high, surmounted by a concrete coping, 6 ins. deep. The wall above this line is of hollow tile, faced with red brick, the total height of the main walls being 21 ft.

The roof is carried on trusses at 18 ft. centres, supported on 8 by 6 in. I beams at 29 lbs., while at the car entrance end there are four columns, each an 8 in., 18 lb. I beam, forming guides for the steel rolling doors, each of which is 11½ ft. wide and 18 ft. high. The roof trusses are of 38 ft. 4 ins. span, 3 ft. deep at the walls, and 4 ft. 8 ins. deep at the centre, with a clearance beneath of 18 ft.

The rear 176 ft. of the barn is for car space, the remaining 22 ft. being in the office end. The car space contains three tracks, each of which will accommodate three of the standard cars. A car pit extends across the barn at the centre, and forward under the centre track to the front of the barn, providing inspection facilities for four cars simultaneously. The space for the three central inspection pits is 51 ft. long, while the fourth, or repair pit, is 47¼ ft. long. The three inspection pits form practically one large pit, occupying the whole width of the building, and roofed over in part by the slab floor of the devil strip, while the repair pit is about 9 ft. wide. The tracks are supported on 6 in. 12¼ lb. I beam posts, spaced at 8 ft. centres. Crosswise between adjacent tracks are 8 in. 18 lb. I beams, with 6 in. 12¼ lb. I beams paralleling the tracks, two between each adjacent pair, to carry the 6 in. slab floor over the pit area. In the tracks of the outer inspection pits there is a slatted wood removable floor on each side of the track, 8 ft. long, and 2½ ft. wide, used for the dropping of pairs of wheels. The track section over this portion is fitted with a sliding joint, so that the movable rails may be slid back on supporting beams, to the back wall of the slatted wood recess. The full length of the repair pit is similarly provided with slatted wood floor sections, two 8 ft. track sections, between supporting columns, being removable, so that parts may be dropped from any position under the car. A hydraulic jack, mounted on a small hand truck, is provided in the pit for dropping car parts. Owing to the open construction of the pit, the jack



Ground Plan of Danforth Avenue Car Barn, Toronto Civic Railway.

can be moved from point to point as required. Concrete steps lead from the floor of the pit to the main barn floor.

The floor of the pit is concrete, as is also the rear or car entrance end of the barn, the flooring of the west end being of wood. At the entrance end of the barn, the first car length of the three tracks has two drainage sumps in the concrete floor. The central track is used as the wash track, a hose from a connection on the south side of the building being employed for that service. The floor of the pits is drained by means of floor wastes at suitable intervals. The first car length outside the barn is similarly concreted, and has drainage sumps, so that, under favorable conditions, car washing may be done in the open. The balance of the distance from the barn to Bracondale Ave. is paved both between and outside the rails to the full width of the barn. The tracks in the barn are 11½ ft. centres. Along the south side of the barn there is a service track, 23 ft. centres from the south inside track, over which supplies can be brought to the repair section, which is in the southwest section of the barn, inside the large sliding doors at that point. The tool equipment consists of a small drill press and emery grinder, but even with this limited equipment, full car repairs are made.

The office and auxiliary rooms, having a ceiling height of 9 ft., are located at the west end of the building, and consist of office, lavatory, stores room, boiler room, oil room and entrance way. The boiler room, oil room and entrance way open to the barn. The oil room has a 9 in. brick wall, and a 6 in. reinforced concrete roof, with fireproof door. The partitions between the other rooms are of metal lath and plaster construction. Over the stores, office and oil room, there is an upper store room, and a waiting room for the car crews, reached by a stairway from the entrance way. This upper floor is carried on two 8 by 6 in. 29 lb. I beams, supporting floor beams of 12 in. 31½ lb. I beams.

DANFORTH AVE. CARN BARN—The site for this barn is an L shaped piece of land, opening out on Danforth and Hillingdon Avenues, the car entrance being from the latter, from tracks branching off from the Danforth Ave. tracks, while the office, workshop, storerooms, etc., are in the small arm of the L, facing on Danforth Ave.

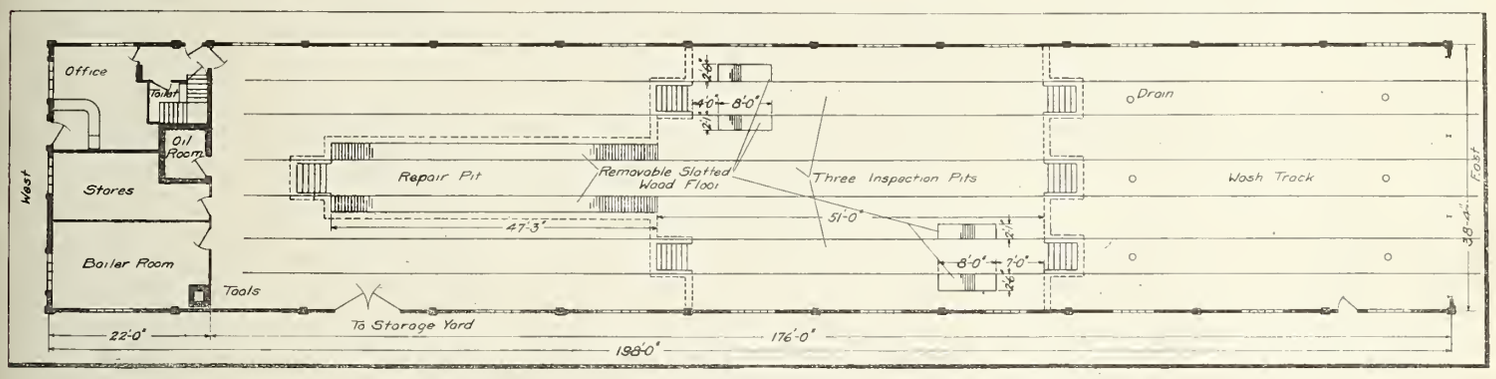
This barn will be of larger capacity than that on St. Clair Ave., accommodating 11 cars. In addition, there will be a larger pit area as well as an increased shop accommodation. The building will be a steel frame structure, with concrete foundations and hollow tile walls, stuccoed on the outside, differing in the latter from the St. Clair Ave. barn. As shown on the accompanying plan, practically the whole of the car barn proper will have a pit beneath it, similar in construction to that in the St. Clair Ave. barn in most particulars, but more extensive. In the inspection pit section there will be three tracks, the full length of the barn, each holding three cars, with a pit extending under the full area. The pit will be 4¾ ft. deep, with a concrete flooring. At the main floor level, a concrete floor will be provided between adjacent tracks, carried on 6 in. 12¼ lb. I beams, paralleling the track, and embedded in the reinforced concrete slab floor, these longitudinal members resting on cross 8 in. 18 lb. I beams, spanning adjacent track columns, which are 6 in. 12¼ lb. I beams at 6 ft. centres. In this section of the shop there will be a side grating in the central track near the east end for a wheel grinding machine, the track in this section being removable in the manner explained for the removable track in the St. Clair Ave. barn.

In the repair pit section, the track will have full length pits, connecting with each other through a cross passage. The pit adjoining the inspection section will connect with, and form a part of, the latter's pit. Alongside the rails, in the outer tracks, there will be slat wood floors, with removable rail sections.

In the Danforth Ave. wing there will be a passageway extending along the east side from the repair pit section to the work shop, store room and men's room in the front. In a corner of the men's room there will be two lavatories, and on the other side of the wing the main office. Back of the office there will be a store room, with a fireproof oil room in a corner, and from the store room there will be a stairway leading up to an additional store room in the second story, which will extend for the entire width of the building from the workshop to the Danforth Ave. end of the building. Back of the lower store room, there will be a work room, containing all the machinery and other necessary equipment, the nature of which has not yet been decided on. A corner of this room will form the blacksmith shop. Between the work room and the repair track section will be the boiler room.

Both barns will be heated by hot air, forced through underground concrete ducts by a fan. The offices will also be equipped with auxiliary electric heaters, for use when heat is not required in the main barns.

We are indebted to G. A. McCarthy, Chief Engineer and Manager, for the information on which the foregoing description has been based and for the plans.



Ground Plan of St. Clair Avenue Car Barn, Toronto Civic Railway.

Lifting Jacks on Street Cars, for quickly releasing any person caught under a car, will be a feature of the safety policy of the Philadelphia Rapid Transit Co. The emergency release service has been improved. Nine emergency districts, each with at least one emergency station, have been established in the city. The equipment of the service includes seven horse-drawn wagons, two auto wagons, two auto wreck wagons, 13 wreck cars and four tower cars—a total of 28 emergency vehicles.

Sherbrook Railway and Power Company's Annual Report.

Following is the directors' report for the year ended June 30, presented at the annual meeting at Montreal, Sept. 28:

The gross earnings were $141,990.29; operating and maintenance, $87,969.78; net earnings, $54,020.51, against $126,646.23 gross revenue; $74,718.31 operating and maintenance; $51,927.92 net earnings, for the year ended June 30, 1913. While the gross income shows a gain of 12.13%, the net earnings only show a gain of 4.03%. This is due to the fact that the operating expenses were $87,969.78, against $74,718.21, an increase of 17.7%. While the increase in gross earnings was considerable, but for the delays in installing the machinery and electrical apparatus of the Canadian Connecticut Cotton Mills Co., the Canadian Brakeshoe Co., and the Panther Rubber Co., the earnings from these contracts would have been considerably larger, whereas very little was realized from them during the year. The extended field of the company's operations and the preparation of these contracts accounted for the increases in the operating expenses. In the operating statement an item has been charged for taxes, which have been in dispute for the last three years. The earnings of the street railway system were affected by a scarlet fever epidemic in Sherbrooke, although every precaution was taken in regard to fumigating the cars. The industrial depression which affected the whole of the Dominion during the past 18 months affected both the street railway earnings and the power revenue, as several manufacturers reduced their power requirements. The prospects, however, for increased earnings in 1915 are as favorable as can be expected, although they must be necessarily affected to some extent by the war.

During the past year the company acquired the assets and undertakings of the Burroughs Falls Power Co., Ltd., at Ayers Cliff, Que., which adds another electric lighting system to those already owned, and a further interest was acquired in the Lennoxville Light and Power Co., which controls the lighting and power business of Lennoxville and Huntingdon. The acquisition of these companies should still further increase the revenue of the company. During the financial conditions of the past year your directors were unable to sell sufficient securities to cover the entire cost of these extensions and purchases, and advances were obtained from the company's bankers to cover the balance required. The company has contracted for the greater part of the power available from its present development, and the earnings should show a satisfactory increase as soon as normal conditions again prevail. The power plant and lighting system have been kept in a high

state of efficiency, and a considerable amount has been expended in the upkeep of the street railway. The directors take pleasure in recording their appreciation of the efficient services rendered by N. C. Pilcher, General Manager, and the officers and staff.

Electric Railway Finance. Meetings, Etc.

British Columbia Electric Ry., and allied companies.—Gross earnings for July $690,023; operating expenses, maintenance, etc. $527,004; net earnings $163,019; against $755,943 gross earnings; $549,947 operating expenses, maintenance, etc.; $205,996 net earnings for July, 1913.

Cape Breton Electric Co. has an application before the Nova Scotia Utility Commissioners asking for sanction to a proposed bond issue. The application states that the company does not propose in the meantime to issue the bonds but to give them as collateral for advances. The Commonwealth Bank of Massachusetts and the Canadian Bank of Commerce have, it is stated, advanced $75,000 to the company. In case the company is called upon to pay the advances at once the bonds would be sold now, but it is hoped that this will not have to be done. The company stated that its last issue of similar bonds was at 91%. If marketable at all now this percentage would not likely be realized, so it is hoped to be able to defer the selling. The company informed the commissioners that it had been in the habit of making improvements out of earnings, which might properly have been charged to capital, and that funds had been borrowed from the banks to help meet the interest coupons and dividend checks. The company had been accumulating a reserve, but in the last two years this had ceased.

Gross earnings for July, $31,466.50; operating expenses and taxes, $19,665.57; net earnings, $11,800.93; interest charges, $5,216.67; balance, $6,584.26; bond sinking and improvement funds, $1,190; balance for reserves, etc., $5,394.26, against $32,543.24 gross earnings; $17,615.56 operating expenses and taxes; $14,927.68 net earnings; $4,891.67 interest charges; $10,036.01 balance; $1,190 bond sinking and improvement funds; $8,846.01 balance for reserves, etc., for July, 1913. Aggregate gross earnings for seven months ended July 31, $200,199.75; net earnings, $80,374.54; interest, bond sinking and improvement funds, $45,622.51; net balance, $35,745.04, against $205,758.62 aggregate gross earnings; $83,688.33 net earnings; $42,652.82 interest, bond sinking and improvement funds; $41,040.51 net balance for same period 1913.

Galt, Preston & Hespeler St. Ry.—A Berlin, Ont., press dispatch, Sept. 10, stated:—"The special committee of the City Council and the Light Commission has decided on what the city will request of the G. P. and H. St. Ry., before the new franchise for running rights over Berlin streets is granted. The present franchise expires in October. After that the city will grant a five-year franchise at $75 monthly for a half-hourly service during afternoon for two years, and after that time half-hourly service all day. The city also wants running rights over the company's tracks in the east end for the municipal railway. After the expiration of the five-year franchise the monthly rental to be $200."

London Street Railway. At a meeting of shareholders August 25, authority was given to issue additional bonds for $50,000.

Saskatoon Municipal Ry.—Traffic receipts for July, $14,758.18 against $14,657.65 for July, 1913; operating expenses, including interest charges and sinking fund, $15,046.87. Statistics—Car mileage, 63,507 miles; earnings per car mile, 25.239 cents; operating expenses per car mile, 23.693 cents; passengers carried per car mile, 4,628; average fare per passenger, 5.023 cents.

Gross earnings on the Sutherland line, $1,201.25; operating expenses including capital charges and depreciation, $992.10. Gross earnings per car mile, 19.852 cents; operating expenses per car mile, 14.743 cents; passengers carried per car mile, 3,072.

Toronto Ry., Toronto and York Radial Ry. and allied compaines.—Gross earnings for July, $866,221; operating expenses, maintenance, etc., $430,194; net earnings $436,927, against $811,966 gross earnings; $401,954 operating expenses, maintenance, etc.; $410,012 net earnings, for July, 1913. Aggregate gross earnings for seven months ended July 31, $5,892,147; net earnings $2,847,694, against $5,467,452 aggregate gross earnings; $2,659,445 net earnings, for same period, 1913.

Winnipeg Electric Ry.—Gross earnings for July $346,630; operating expenses $194,356; net earnings $152,274, against $336,821 gross earnings; $183,689 operating expenses; $153,132 net earnings for July, 1913. Aggregate gross earnings for seven months ended July 31, $2,438,182; net earnings $1,030,124, against $2,309,195 aggregate gross earnings; $1,030,121 net earnings for same period 1913.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford St. Ry.-Grand Valley Ry.—The Commission having charge of this railway made a trip of inspection over the Grand Valley section from Brantford to Galt, Ont., Aug. 29. The culverts and bridges particularly were examined, and with one exception are said to have been found in a satisfactory condition. The exception is the bridge over the G.T.R. subway at Blue Lake, which it was decided to close for traffic. Cars are run to each end of the bridge, and the passengers walk from one to the other. The line is being put in repair, several gangs of men being at work south of Paris and north of Glenmorris. Ties have been delivered at Blue Lake. The inspection was made for the purpose of ascertaining what further work was necessary in order to put the entire line in a good condition, and a report on the inspection is being prepared by K. N. Bunnell, City Engineer, and —. Jones, Consulting Engineer. (Aug., pg. 385.)

British Columbia Electric Ry.—An arrangement has been completed as to the rental to be paid by the company for street ends and bridges in Vancouver, and an agreement is being prepared which will run to Feb., 1919, when the company's franchise expires. The rentals to be paid are as follows:—For Connaught St. bridge, $3,000 a year; for Georgia-Harris St. bridge, $3,600 a year; for Prior St. end, $750 a year; for Union St. end, $875; towards cost of traffic policeman opposite the station at Granville St. bridge, $1,200 a year.

The Georgia-Harris bridge is expected to be completed in Nov., and the City Council is placing the order for the special connections necessary to connect it with the street car tracks. (Sept., pg. 431.)

An arrangement has been made with the C.P.R. by which the company will build a line on South Cambie St., Vancouver, as far as King Edward Ave., thence to Main and Oak Sreets, to connect with existing lines. It is not expected, however, that work will be started on the new line until the spring. (Sept., pg. 431.)

Chestermere and Calgary Suburban Ry.—The Alberta Legislature is being asked to grant an extension of time for the building of this projected electric railway from Calgary to Chestermere Lake, Alberta. Griffiths, Ford, Wright and Miller, Calgary, solicitors for the applicants. (May, 1913, pg. 235.)

Cornwall St. Ry., Light and Power Co.—The ratepayers of Cornwall, Ont., will vote, Oct. 14, on a bylaw granting the company an extension of its franchise for an electric railway. The original franchise was granted, Dec. 28, 1895, to W. R. Hitchcock and his associates, who transferred it to a company, which subsequently was taken over in the interests of the bondholders, and a new company formed. The bylaw provides for an extension of the franchise for 20 years upon the same terms as the original bylaw and the amendments thereof, with the following exceptions:—The payment of $300 by the town to the company is to cease, and the company is to pay all taxes on the assessed value of its property. Certain regulations for traffic are made in new sections, and provision is also made for the rebuilding of the loop lines on Cumberland and Water Streets.

Edmonton Radial Ry.—By an arrangement with the Hudson's Bay Co., the work of paving and laying tracks for the street railway on Portage Ave., Edmonton, Alberta, is to be gone on with at once. The work is estimated to cost about $40,000. (July, pg. 335.)

Hydro Electric Power Commission of Ontario Projected Railway.—The series of 30 meetings organized in the various municipalities interested in the project for the building of an electric railway from Toronto to Markham, Port Perry, and other points, is being held, the final meeting being fixed for Oct. 17. The vote will be taken in the various municipalities Oct. 19. The question to be submitted to the ratepayers will be whether authority shall be given to the various councils to raise the amounts mentioned in our July issue, pg. 337, by debentures, which will make up the $3,954,914, which is the estimated cost of the building and equipment of the 77.55 miles of line proposed. (Sept., pg. 431.)

London Street Railway.—We were officially advised recently that two small paving jobs of about 700 or 800 ft. each were being finished up. In one case the work is paving only, and in the other the track is being replaced with new ties and 80 lb. A.S.C.E. rail, moulded scoria block being used in alternate courses to form flangeways. The foundation of both the track and the paving in this case is concrete, as the subsoil is clay. (July, pg. 335.)

London and Port Stanley Ry. Electrification.—A difficulty occurred at the beginning of September between the London Railway Commission and the Pere Marquette Rd., which is carrying out certain parts of the work of electrifying the L. and P.S. Ry., as a result of which the Commission ordered the company to vacate the line within 30 days. The matter, however, was adjusted, and reconstruction work was resumed, Sept. 8. It was subsequently announced that new rails have been laid on the entire line; that most of the new ties have been put in, and that much of the ballasting has been done. The traffic was not interfered with during the few days the

difficulty existed. (Sept., pg. 430.)

The Moncton Tramways, Electricity and Gas Co.'s car barn at Moncton, N.B., was completely destroyed by fire, Sept. 14, the damage to building and contents being placed at $10,000. The barn will be rebuilt at once. (Aug., pg. 385.)

Morrisburg and Ottawa Electric Ry.—The Morrisburg and Ottawa Construction Co. has been incorporated under the Ontario Companies Act, with a capital of $40,000 and office at Ottawa, to carry on railway contracting, and other allied businesses. The provisional directors are:—A. J. Fraser, M. J. Brennan, Miss L. E. Milks, Miss L. B. Younghusband, Ottawa; and G. D. Mumford, New York. These are merely nominal directors, for the purposes of incorporation. The company is apparently being formed in connection with the New York syndicate with which negotiations have been in progress for some time for building the line from Morrisburg to Ottawa, 55 miles. (Sept., pg. 431.)

Sudbury and Copper Cliff Suburban Electric Ry.—The following directors have been elected: J. J. Mackey, President; J. H. Morin, Vice President; M. J. Powell, Secretary; D. M. Morin, C. McCrea, T. E. Smith. The work done by the provisional directors has been confirmed.

Sarnia St. Ry.—The Sarnia, Ont., City Council passed a bylaw recently authorizing the company to take up its tracks leading to the Pere Marquette Rd. station, and to relay them down Christina St. to Clifford St., and westerly on the latter street. (May, pg. 232.)

Toronto Ry.—The King St. cars run along Queen St. from the junction of King and Queen Streets, west of the Don River, as far as Scarboro Beach Park, through which there is a loop back to Queen St. From this point there is a line east to the city limits, where the old Victoria Park used to be, which has been operated as a stub line for some years. The city is grading and paving Queen St., from Scarboro Beach Park to the city boundary, and in connection with this the stub line is being rebuilt. Rails and other materials have been delivered. It is said that when completed the King St. cars will run over it, instead of turning back from Scarboro Beach Park as now. Commissioner of Works Harris is reported as stating, Sept. 17, that work on the line would be started at once. (Sept., pg. 432.)

Transcona, Man.—By arrangement with the Transcona, Man., Town Council, J. H. Kern, who holds the franchise for the building of an electric railway in Transcona, to the boundary of the City of Winnipeg, is required to start active construction on the line in the spring of 1915. It is said that certain preliminary work is being done, however, and that ties have been delivered along the route. (Sept., pg. 432.)

Winnipeg Electric Ry.—The Winnipeg City Council decided Sept. 8 to reject the plans submitted by the company for bettering the traffic conditions at the St. James' subway. (Sept., pg. 432.)

The Victoria General Motor Bus Co. has been incorporated under the British Columbia Companies Act., with a capital of $50,000, and office at Victoria, to carry on the business of "transferring and transporting from place to place, persons, goods, wares and merchandise of all kinds by motor buses, automobiles, motor trucks," and other vehicles with "either motor, steam, horse or other power." The directors are:—T. Grayson, T. N. Hibben, A. D. Lewis, J. D. Pemberton and L. M. Earle. C. F. E. Crawford is Secretary pro tem.

Personal Paragraphs.

J. J. HACKNEY has been reappointed Commissioner of Public Utilities by the Port Arthur, Ont., City Council.

H. DOUGHTY, formerly Superintendent Regina Municipal Ry., has been appointed Assistant to Traffic Superintendent, Winnipeg Electric Ry.

Capt. C. W. McLEAN, of the Royal Horse Artillery, who is reported to have sailed from Bombay for England recently, for active service with the Canadian contingent, is a son of Col. H. H. McLean, M. P., President St. John Ry., St. John, N. B.

Trouble With Militia in London.—On Sept. 18, a small detail, of some 6 or 8 men of the 7th regiment, were returning from some outside point to the armories at Waterloo and Dundas Sts., London, Ont., marching westward on the right hand side of the street, clear of the car track, while a street car was going in the same direction. Having no stop to make at Waterloo St., the motorman continued at full speed, apparently not bearing in mind that the militia men might turn across the track into the armories. The result was that when they did make such a turn the car was too close to them to be stopped in time. They, however, heeded the motorman's warning and jumped out of the way, so that none of them were struck. The militia authorities did not blame the company, but threatened to lay information against the motorman, but when it was pointed out by the management that he had violated the company's rules and would be disciplined accordingly, no proceedings were instituted. Subsequently the motorman was dismissed from the service, it being claimed that he had shown an inclination to recklessness on some other occasions.

Quebec Ry., Light, Heat and Power Co.—It is stated that the report for the year ended June 30 will show a gross revenue of over $1,525,000; operating expenses, $910,000, and net earnings approximately $615,000, compared with $629,000 the previous year. From this the bond interest of about $500,000 is met, leaving a surplus of about $115,000, or equal to 1.15% on the common stock.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY-TREASURER — Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY — Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

Electric Railway Notes.

The Toronto City Council has abandoned the negotiations of buying the Toronto Ry.

The Montreal Tramways Co. has received 18 cars from Canadian Car and Foundry Co.

The Montreal Tramways Co. has decided to equip the rear platform of all its double truck cars with folding doors and steps.

The Kingston, Portsmouth and Cataraqui Electric Ry. turned all its gross receipts on Sept. 19 to the Canadian Patriotic Fund.

The Edmonton Radial Ry. has received two single end p.a.y.e. double truck city cars, completing the order for 35, placed with the Preston Car and Coach Co.

The autumn schedule of cars on the Winnipeg Electric Ry. show that a number of stops on the Princess St., Portage Ave. and Main St. lines have been eliminated.

The Ontario Railway and Municipal Board has approved the London St. Ry.'s plans for 4 single truck p.a.y.e. cars ordered from the Preston Car and Coach Co.

The Dominion Government has purchased from the Quebec Ry., Light, Heat and Power Co., 22 acres of land adjoining the military camp at Valcartier, Que., at a price to be fixed by the Court of Exchequer.

The Railway and Lighting Rifle Association has been formed by employes of the Toronto Ry., Toronto and York Radial Ry., and Toronto Power Co. W. R. McRae, Master Mechanic, Toronto Ry., is secretary.

R. P. Lewis, Traffic Superintendent for the Winnipeg City Council, has arranged with the Winnipeg Electric Ry. for the rerouting of cars on several lines with a view to giving better service. The new routes were put in operation Sept. 16.

The Detroit United Ry., press reports state, has purchased Stag Island, near Sarnia, Ont., and will lay it out as a summer pleasure park. The island is in Canadian territory, and can be easily reached by one of the D.U.R.'s interurban lines.

The members of the Montreal Electrical Society visited the Montreal Tramways Co.'s Youville shops, Sept. 5. D. E. Blair, Superintendent of Rolling Stock, explained the layout of the shops and the work done there. J. N. Mochon, President of the Society, acknowledged the courtesy extended.

Mayor McNamara, of Edmonton, Alta., in speaking in New York recently, referred to the electric railway operated by the city, and said that much of the loss was caused by the lines, owing to "log rolling" having been extended far out into unoccupied territory, where landowners hoped that there would be population some time.

A recent report of the U.S. Census Bureau states that in the ten years, 1902-12, the number of passengers carried by electric railways increased by nearly 108%, the revenues by more than 130%, and the capitalization by 104%. The increase in passengers carried, revenue, and capitalization for 1913, is stated to be in the same proportion.

Particulars of the Toronto Ry. Employes Union's application to the Ontario Railway and Municipal Board, for an order to compel the Toronto Ry. to abolish the running board on open cars, and to substitute centre aisles, were given in Canadian Railway and Marine World for July, pg. 338. When the case came up again Sept. 24, the Toronto Ry. was not represented, and it was further adjourned to Oct. 2.

The Port Arthur and the Fort William, Ont., City Councils have approved of a new

schedule of fares for the electric railways within their cities, and on the line connecting the two cities. The new fare is a straight 5 cent one, and the tickets are five for 25 cents. Limited tickets for workmen and school children's tickets will remain as at present. The new schedule is expected to go into effect Oct. 1.

A suggestion having been made to R. J. Fleming, General Manager, Toronto Ry., that militiamen in uniform should be carried on the cars free of charge, he is reported to have said:—"Do the bakers give these men their bread? Do the butchers give them their meat? Do the landlords give them their rent? Do the other railways give them transportation? We are perfectly willing to sit in with the other people and do our share of helping the soldiers."

An application by the City of Toronto was heard by the Ontario Railway and Municipal Board at Toronto, Sept. 16, to compel the Toronto Ry. to build and operate a line on Bloor St. West between Dundas St. and Pacific Ave. On behalf of the city, it was urged that the district to be served was much in need of street car facilities, and citizens were put to inconvenience and loss of time under present conditions. H. S. Osler, K.C., for the company, contended that the company had abandoned all the rights it ever had on the street in the locality in question. A decision was promised in the near future.

Pitt River Bridge, B. C.—The construction of the traffic bridge across the Pitt River, between Pitt Meadows and Port Coquitlam, B.C., is being pushed forward. The piling for the approaches has been completed, and the concrete work is being gone on with. No. 1 pier is completed; no. 2 caisson is down and sealed; no. 3 caisson has been sunk; no. 4 caisson is being sunk, and no. 5 caisson is ready for sinking. The substructure work is expected to be finished by the end of the year. The steel superstructure of the old C. P. R. bridge, a short distance away from the site of this bridge, was bought, and will be erected in the spring. The bridge will carry tracks for a projected electric railway.

Special Corps of Engineers.—The Canadian General Electric Co. has raised from its mechanical staff a corps of 25 electrical and mechanical engineers which it has placed at the Dominion Government's disposal during the war and which it will maintain during that period. After being sworn in at Toronto, Sept. 16, they assembled at the company's general offices, where they were received by several of the directors and addressed by the President, Frederick Nicholls. Nine of them have gone to Esquimalt, B.C., 8 to Quebec and 8 to Halifax, N.S.

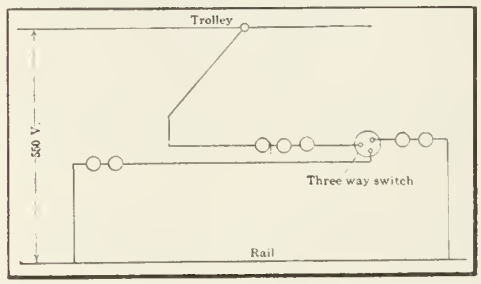
Rubber Tires for Street Cars.—In order to reduce the noise of street cars, and particularly the flat wheel nuisance, it was suggested at a recent meeting of the Tramways Association, in Newcastle, Eng., that street cars be provided with rubber tires. It was argued that the wear on the rails would be much reduced, and the life of the rubber tire would exceed that on motor trucks and busses, which are credited with an average life of 20,000 miles. It was also argued that a higher rate of speed would be possible with the flexible tire.

The American Electric Railway Association's annual convention will be held at Atlantic City, N. J., Oct. 12 to 16.

Condensation from Concrete Roofs may be materially reduced by an adequate system of ventilation.

Three-Way Switch on Seven-Lamp Car Circuit.

The accompanying diagram shows a wiring scheme which was adopted on the Montreal & Southern Counties Ry. when the writer was its power house construction foreman. These cars have standard interurban closed bodies 49 ft. 4 ins. long and 8 ft. 1 in. wide, and are of the combination smoking and passenger type. Three lamps are in the smoker and two lamps are on each end platform. However, only five



Wiring arrangement for three-way switch on Seven-lamp Circuit.

lamps are in use at the same time, as only one platform is illuminated, according to the direction of running. On completing a run the motorman actuates the three-way switch to cut out the two lamps at the end which served as the conductor's platform and then he cuts in the lamps at the conductor's new position. Six cars were equipped in this way owing to the fact that they were originally over-illuminated.—J. G. Koppel, Electrical Engineer of Bridges, Duluth, South Shore and Atlantic Ry., Sault Ste. Marie, Ont., in Electric Railway Journal.

Conflict of Authorities re Wireless Telegraph Equipment on Vessels.—It is reported that U.S. authorities are taking action against the British s.s. Roxburgh, for an infringement of the law requiring all ocean going vessels not to leave U.S. ports without a wireless telegraph installation, the maximum penalty being $5,000. When ordered by the authorities at Baltimore, Md., to have his vessel equipped before sailing for Bordeaux, France, the captain is stated to have pointed out that the British Government had ordered that no British merchantmen were to carry wireless equipment during the war, and he at once wired his owners for instructions, they replying to the effect that the British Government's order must be obeyed. The facts have been placed before the U.S. District Attorney.

The Prince Edward Island Car Ferry.—Sir W. G. Armstrong Whitworth & Co., Ltd., Newcastle-on-Tyne, Eng., who are building the car ferry for service between Cape Tormentine, N.B., and Carleton Point, P.E.I., which was to have been launched on Aug. 21, have written Canadian Railway and Marine World that the European war has entirely altered the programme. The machinery, which was being built for the car ferry, has had to be put on one side, to enable them to execute urgent contracts for turbine machinery for the British Admiralty, which has to be completed with all speed, to the exclusion of everything else, and they have informed the Dominion Government that the launching of the car ferry has been indefinitely postponed.

The C. P. R. has contributed $100,000 to the Canadian National Patriotic Fund, in addition to placing a steamship at the Government's disposal as a hospital ship, the equipment of which has been undertaken by Canadian women.

Lake Superior Corporation's Annual Report.

The report for the year ended June 30 contains information of a general nature in regard to the subsidiary companies.

The Algoma Steel Corporation made 325,680 tons of steel rails, against 289,343 the previous year. Its pig iron output was 311,904 tons, against 326,073, and merchant mill 15,576 tons, against 26,295.

Algoma Central and Hudson Bay Ry.—The directors regret that they are not able to announce increased earnings. The railway has been finished to its junction with the Canadian Northern Ry., and completion of the remaining 50 miles to its terminus at Hearst on the National Transcontinental Ry. is expected early in October. Owing to the fact that the Canadian Northern and the National Transcontinental are not yet in operation, there has been practically no traffic north of the C.P.R., and in addition, owing to delay in the development of the Algoma Steel Corporation's mines to their full capacity, the railway has not obtained its expected ore traffic. This particular traffic must necessarily be the most important part of its business for some time to come.

The directors report that during the storm of Nov., 1914, the s.s. Leafield was lost with all hands. The loss was fully covered by insurance. This vessel has been replaced by the J. A. McKee, and in addition the railway has secured on advantageous terms the s.s. E. D. Carter, 10,000 tons. The A.C. & H.B. Ry. Co. now owns or controls seven modern steamships, all of which are profitably employed. The work of equipping the railway with proper terminals has been rapidly progressed with, and the coal bridge and dock are now operating at Sault Ste. Marie. The dock has a storage capacity of 125,000 tons.

Algoma Eastern Ry.—The directors report increased earnings. Traffic was heavier than for the previous year. The entire construction of this railway, including the terminals at Little Current, has been completed, and the coal bridge and dock at Turner are in operation. Considerable tonnage has been booked for unloading at Turner, and the revenue to be derived therefrom should considerably assist the earnings of the railway.

International Transit Co. and Trans-St. Mary's Traction Co. continue to maintain their earnings. There is under discussion the extension of the franchises of the former.

Motor Omnibuses for North Toronto.—The inauguration of the motor bus service in North Toronto, arranged for by Robins Limited, has been postponed. The bodies for the busses, which will provide seats for 26 passengers, are being built by the Preston Car and Coach Co., Preston, Ont. The chassis, etc., are being procured from England, and it is stated that as soon as they arrive the busses will be completed and the service started.

Among the foreign built vessels which have been transferred to the United States register recently, under the act passed on Aug. 18, are:—The s.s. Moldegaard, built at Bergen, Norway, in 1906, and rebuilt at Brooklyn, N.Y., in 1913, formerly owned by the Ocean Freight Line, Ltd., Toronto; the s.s. Oceana, built at Dumbarton, Scotland, in 1891, owned by the Bermuda Atlantic Steamship Co., Toronto, and the s.s. Robert Dollar, built at Port Glasgow, Scotland, in 1911, owned by the Dollar Steamship Lines, Ltd., Victoria, B.C.

Marine Department

Lock Gate Lifter for the Trent Valley Canal.

The Department of Railways and Canals has had a steel pontoon lock gate lifter built, to lift and place in position the lock gates on the Trent Canal in Ontario. Its capacity of 50 tons and clearance of 37 ft. above the deck will enable it to step any of the mitred gates throughout the entire length of the canal. The general design comprises a structural steel collapsible derrick mounted on a steel pontoon, with separate steam engines for each operation.

Fig. 3. Steel Pontoon Gate Lifter taking hold of a leaf of the lower gates of lock 4, Trent Canal.

The pontoon supporting the derrick is made of steel plating with extra strong steel frame work, there being two longitudinal and three transverse trusses, so as to provide for the severe loads it will have to bear. The hull is constructed with rounded bilges and each end has a rake of 45 degrees. The length is 55 ft., beam 27½ ft., depth 9 ft.

The derrick is built of structural steel in two units. When in working position the derrick is erect as shown in fig. 1. In transporting the lifter from one lock to another the upper part of the derrick is lowered where necessary, as shown in fig. 2, which allows of its passage under overhead bridges along the canal. The operation of raising and lowering the derrick is performed by a 6 by 6 double cylinder engine, mounted on one of the back legs. Two swivel hook padlocks are suspended, one from each overhanging top of front legs of the derrick, each carrying 8 parts of ⅞ inch steel cable. The main engine has 9 by 9 double cylinders, double drums, and is link reverse. The operating levers are brought to one position for the convenience of the enginemen.

The pontoon is kept on an even keel by two movable ballast cars under deck. Each car is moved by a steel screw operated by independent 6 by 6 reversing engine. These engines are controlled by pendulum governors, automatically shifting the ballast to the proper position to put the pontoon on an even keel, whether it is under load or light, with the derrick upright or folded. In addition to the automatic control the ballast car engines can be operated from the engine room above deck. Dial indicators are provided to show the position of the ballast cars at all times.

We are informed that the machine has already stepped the gates for locks 1, 2, 3, 4, 5 and 6 of the Ontario-Rice Lake Division of the canal, and that the total time for stepping each leaf, from picking it up in the water to releasing it in the gate recess, varied from 20 to 40 minutes, according as an upper or lower gate leaf was handled, respectively. At lock 3 the lower gates are 37 ft. high over timbers and represent the heaviest gates the lifter is designed to handle.

Fig. 3 shows the gate lifter in the operation of stepping a gate.

The whole outfit was manufactured by M. Beatty & Sons, Ltd., Welland, Ont.

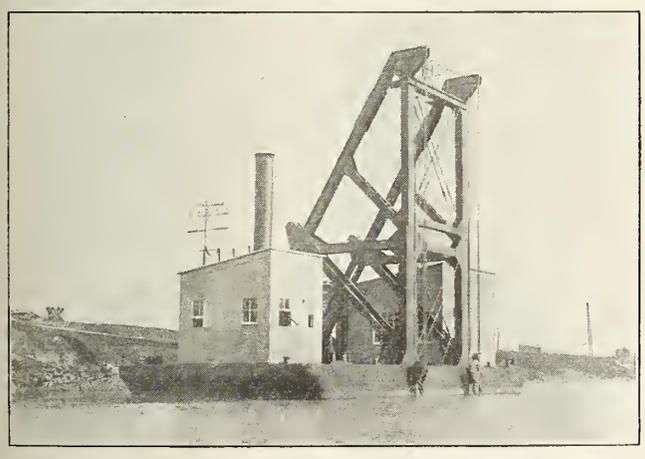


Fig. 1. Gate Lifter, showing top of derrick raised.

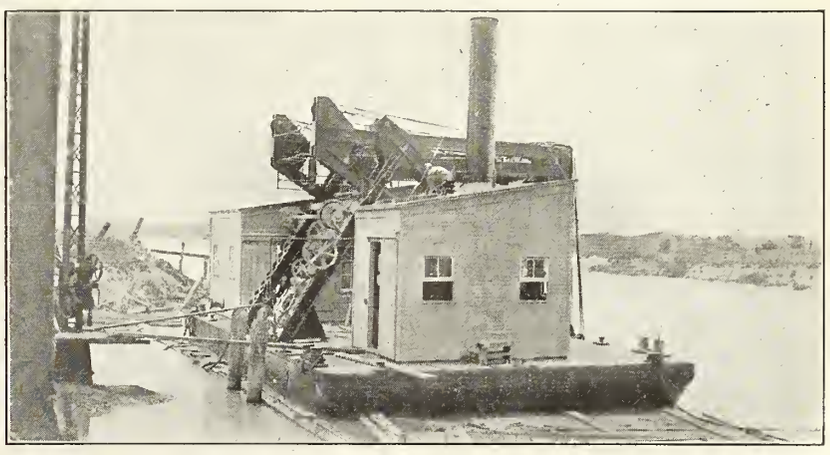


Fig. 2. Gate Lifter, with top of derrick lowered for passing under bridges.

Dominion Government Vessels for Hudson Bay.

In connection with the Government work at Port Nelson in Hudson Bay, the following vessels have been purchased,—s. s. Durley Chine, from the Alum Chine Steamship Co., London, Eng.; s. s. Sharon, from The Ottoman Line, Ltd., Newport, Eng.; s. s. Sheba, formerly owned in Monmouthshire, Eng.; sailing vessel Bargany, from Carl Beck, Twedestand, Norway, and sailing vessel Benmore, from the Fenchurch Trading Syndicate, London, Eng.

The sailing vessels were purchased for the carrying of coal from England direct to Port Nelson, where they will be used as bulkheads in connection with the harbor work. In addition to the purchase of the foregoing steamships, the Government has chartered the Newfoundland whaling steamships Bellaventure and Bonaventure, both of which are well accustomed to the waters and conditions on Hudson Bay.

The Laing Boat Co., Ltd., has been incorporated under the Quebec Companies Act, with capital of $20,000 and office at Lachine, to build, own and operate all kinds of vessels, hydroplanes, airships, etc.

Duty on Repairs to United States Vessels in Foreign Ports.

Mention was made in Canadian Railway and Marine World for September of a press report that the Victoria B.C. Board of Trade had received a communication from the U.S. Government to the effect that no duty would be charged on repairs done to U.S. vessels in Canadian ports. On enquiry the Secretary of the Victoria Board of Trade advised us that the U.S. Consul there had written him that as he understood it there is no duty or charges whatsoever on repairs to U.S. ships in foreign ports.

We then communicated with the U.S. Treasury Department at Washington, D.C., asking for full information in regard to the matter and received the following answer from the Assistant Secretary:—

"In reply to your enquiry whether duties, if any, are levied on repairs made to U.S. vessels while in Canadian ports, and whether repairs made to ocean going vessels in foreign ports are dutiable, I have to advise you that the Revised Statutes, Sec. 3,111, provides that:—'The equipments, or any part thereof, including boats, purchased for, or the expenses of repairs made in a foreign country upon a vessel enrolled and licensed under the laws of the United States to engage in the foreign and coasting trade on the northern, northeastern and northwestern frontiers of the United States, or a vessel intended to be employed in such trade, shall, on the first arrival of such vessel in any port of the United States, be liable to entry and the payments of an ad valorem duty of 50% on the cost thereof in such foreign country; and if the owner or master of such vessel shall willfully and knowingly neglect or fail to report, make entry, and pay duties as herein required, such vessel, with her tackle, apparel, and furniture, shall be seized and forfeited.'

"The Revised Statutes, Sec. 3,115, provides that:—'If the owner or master of such vessel shall, however, furnish good and sufficient evidence that such vessel, while in the regular course of her voyage, was compelled, by stress of weather or other casualty, to put into such foreign port and purchase such equipments, or make such repairs, to secure the safety of the vessel to enable her to reach her port of destination, then it shall be competent for the Secretary of the Treasury to remit or refund such duties, and such vessel shall not be liable to forfeiture, and no license or enrollment and license, or renewal of either, shall hereafter be issued to any such vessel until the collector to whom application is made for the same shall be satisfied, from the oath of the owner or master, that all such equipments and repairs made within the year immediately preceding such application have been duly accounted for under the provisions of this and the preceding sections, and the duties accruing thereon duly paid; and if such owner or master shall refuse to take such oath, or take it falsely, the vessel shall be seized and forfeited.'

"It has been held by the Department that repairs made in foreign port upon a registered vessel engaged bona fide in commerce by sea are not dutiable, and that repairs to a pleasure yacht in a foreign port are not dutiable. You will note that, under sec. 3,115, the condition precedent for exemption is that the vessel 'while in the regular course of her voyage was compelled, by stress of weather or other casualty, to put into such foreign port for repairs.' It has also been held that repairs made to a vessel in a foreign port after she had been in winter quarters in that port are not exempt, although such repairs were necessary to secure her safety."

Shipping Report From Fort William.

F. & W. Jones, grain, vessel and marine insurance brokers, Fort William, Ont., wrote, Sept. 15:—Coal arrivals continue steady, there have been 16 cargoes since the first of the month, all of which were bituminous, no anthracite has been unloaded during this half of the month. Dispatch continues satisfactory, there have been only slight delays occasioned by direct loading into cars. There has also been slight delay at one dock when piling at back of dock, owing to difficulty in getting more than one rig to work. Western rail shipments are now normal and stocks are decreasing rapidly. There is no definite line-up of "en routes" reported yet for the balance of the month, but docks are all expecting a brisk run of business. Stocks of coal on docks are fairly heavy and are approximately as follows, but there is still abundance of available space:—

	Bituminous.	Anthracite.
Canadian Northern Coal Dock, Port Arthur	450,000	210,000
Canadian Pacific Coal Dock, Fort William ...	620,000	250,000
Fort William Coal Dock, Fort William	370,000	34,000
	1,440,000	494,000

The autumn movement of grain has commenced, but in no great volume up to date. There are, however, prospects of heavy grain surrenders by shippers for nearby shipments. Twenty-nine cargoes have gone east since the first of the month, three only of which were in U.S. bottoms. The prospects of any great increase in the percentage of U.S. bottoms is not very promising at time of writing. Dispatch in grain loading will materially improve with the arrival of the new crop. Sunday working has commenced at the elevators in order to facilitate loading. Night working, however, except when a vessel can be cleared at night, is discouraged, on account of the difficulty in grading grain. Stocks at elevators have increased materially, the total of all grain at present in all elevators being over 1,000,000 bus. in advance of same time last year. The following is standing of stocks at time of writing:—

	Stocks.	Receipts.	Shipments.
Wheat ...	3,736,852	4,162,094	1,631,129
Oats	330,375	397,361	159,808
Barley ...	213,720	146,891	65,092
Flax	2,074,766	31,789	311,508

The crop outlook remains unchanged from last writing, the total figures are generally accepted as from 180,000,000 to 200,000,000 bus. of all grains to come forward for eastern shipment. Great Britain is expected to make considerably increased demand on Canada this season, probably to the extent of an additional 30,000,000 bus. of wheat and oats. To move the crop in sight in time to catch ocean connections before the close of navigation would mean a very active lake movement, and it is more than probable that a large winter storage business will result.

A comparison of last season's lake shipments, commencing with Sept. 1, 1913, and ending Aug. 31, 1914, is interesting as showing the percentage of Canadian and U.S. bottoms. There were 1,135 cargoes, 350 of which were U.S. bottoms. The total amount of grain carried was 191,911,432 bus. of all grains, of which 92,030,398 bus. were in U.S. bottoms or 49% of the whole, and 99,881,034 bus. in Canadian bottoms.

Shipments by vessels, Port Arthur and Fort William, crop year 1913-1914:—

	Canadian Vessels.	U.S. Vessels.	Total.
Cargoes	788	350	1,135
Wheat bush.	64,121,076	62,105,746	126,226,882
Oats "	25,276,164	14,351,323	39,627,488
Barley "	5,942,638	4,031,185	9,973,824
Flax "	2,218,179	9,927,058	12,145,237
Other grains "	1,322,977	1,615,086	2,938,063

The Stranding of the s.s. Anglo-Brazilian in Montreal Harbor.

An investigation into the stranding of the s.s. Anglo Brazilian in Montreal harbor, on Aug. 26, was held at Quebec, on Sept. 8 and 9, before Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. F. Nabb and Pilot Angers, acting as nautical assessors. Fourteen witnesses were examined, including the Montreal Harbor Master, Capt. Bourassa, who stated that the day prior to the departure of the Anglo Brazilian he saw that sufficient room was given for hauling her out the next day, and did not notice any barge lying at the end of Tarte pier, nor had he given permission to berth any vessel there. The master of the vessel, F. W. Richardson, stated that the Anglo Brazilian is a steel vessel of 4,668 tons net, and 7,486 gross tonnage, carrying a crew of 38 all told, including 3 deck officers, all duly certificated. She is owned by the Nitrate Producers Steamship Co. of London, and chartered by the New Zealand Steamship Co. She was fully loaded with 9,000 tons of general cargo, and was bound for Australian and New Zealand ports, and at the time of leaving the wharf at Montreal was drawing 27 ft. 2 ins. fore and aft. She left the wharf at 6.15 a.m. in charge of Branch Pilot C. B. Hamelin, and with the assistance of two tug boats, as usual, was hauled from the wharf into the stream, and at a little distance above the berthing place which she had just left the bow tow rope parted and the vessel swung around with her bow to the south, under the effect of the current, and grounded on a bank and hung by the middle. Prior to the rope parting, and when endeavoring to head up stream, he noticed a scow at the end of Tarte pier, and in order to clear the scow the helm was starboarded and the vessel shortly afterwards took a sheer, and before she could recover the tow rope parted. He also stated that the steering gear and rudder were all right, as they had been examined half an hour before the lines were cast off. The gear is of the telemotor type. When the pilot reported something wrong with the gear the engineer was ordered to make an examination and reported everything was all right.

The master of the tug Aurelie G., which was the stern tug, said that he noticed at a certain stage, when the ship was heading up river to turn around, that the rudder remained amidships, which appeared to him as strange, and he called out to the pilot, advising him of that fact, but was not aware if the pilot heard him. The pilot of the Mathilda, the tug boat at the bow, testified that the hawser which was passed to him did not seem to be good, therefore he did not think it advisable to put all power on his boat, and had, up to the time of the parting of the rope, been going on the speed of four bells, which is apparently a local custom and signifies that the engines are working to obtain a speed on the tug of slightly over slow speed. The pilot stated that it is his impression that for some moments something occurred to impede the working of the steering gear, and therefore can only account for the ship not recovering more promptly to that fact, also to that of the parting of the tow rope. He also stated that if no scow had been tied to the end of the Tarte pier he would have passed at the usual distance from the end of the pier, and would consequently have benefitted in space as well as in the eddy forming between Tarte and Laurier piers. The evidence of the other witnesses did not materially differ from that given by the preceding ones.

The court is unanimous in exonerating the captain and officers of the Anglo Bra-

zilian, as well as the pilot, for the stranding. It has been conclusively demonstrated that everything was done that could have been done in such moments, and that the grounding was due to the parting of the tow rope at a critical moment. We have made a special examination of the steering gear and ropes, and we found that at the time of the visit on board the steering gear did not come up to our expectations; but we found it was due to a hot bearing, caused by a little dirt having been left the day previous during the overhauling by the 4th engineer. Moreover, the machinery and rudder worked in a satisfactory manner afterwards. We have ascertained that the ropes shown, and which were used on the occasion of the grounding, were good and sound. The first one shown seemed to have had somewhat more usage than the last one, which broke, and which was, in our opinion, the direct cause of the casualty. With regard to the scow tied at the end of Tarte pier, we recommend that the bylaws governing the duties of the Harbor Master, and vessels within the harbor limits, should be stringent. The fact of the scow being berthed at the end of the pier, without the knowledge of the Harbor Master, and contrary to the bylaws of the Harbor Commissioners, reduced the already narrow space in which vessels leaving Tarte and Laurier piers and vicinity have to manoeuvre. We suggest that no vessels of any description be allowed at the end of any berths, as in view of the narrowness of the spaces such berthing is fraught with danger to the vessel so berthed and exposes others passing by to meet with delay, if not disaster. Whilst we do not attribute this accident to the fact that the scow was tied to the end of Tarte pier, yet we affirm it would have been better if such had not been there.

The Vancouver Dry Dock Project

The construction of the dry dock at Vancouver, being undertaken by the Dominion Shipbuilding, Engineering and Dry Dock Co. is proceeding, contracts having been awarded for excavation, concrete work and steel construction. About 300 men are reported to be working on the first stages. The foundation piers for the first group of three large buildings have been built, all being of reinforced concrete. The area covered is 150 by 850 ft. Two of the buildings will be 150 by 250 ft. and the third about 100 by 150 ft. The outside row of piers for the foundations are 6 by 4½ ft., and the inner row 4 by 4 ft., all by 6 ft. high. As soon as the whole site has been cleared, the shore of Lynn Creek, which is the eastern boundary of the site, will be cleared, after which, the channel will be straightened and deepened by dredging.

It is announced that the Dominion Government has approved the plans, and granted the full subsidy under the act granting aid in the construction of dry docks, viz,—4% on an expenditure of $5,500,000, for 35 years, and it is stated that the financing of the project was all arranged for in London, Eng. before the outbreak of war. The dock is to be of the first class and most modern type, capable of handling the largest ocean going vessels and British warships. It will be 1,150 ft. long by 100 ft. wide, divisible into two sections, one of 650 ft. and one of 500 ft.

The officers of the company are,—President and Managing Director, Capt. H. Mowatt, formerly Marine Superintendent, C. P. R. Steamships, Liverpool, Eng.; Vice President and Assistant General Manager, R. Fowler, Vancouver; Chairman European Board, H. Grayson, Managing Director, H. and C. Grayson, Ltd., shipbuilders, Liverpool, Eng.; financial agents, Frey and Co., Vancouver, New York and London.

T. A. Frey left Vancouver recently for New York and London, to represent the local interests at a meeting of the board in London.

A Projected United States Government Merchant Marine.

The United States Congress committee of Naval Affairs completed and reported a bill recently authorizing an appropriation of $30,000,000, to enable the President to build or purchase thirty naval auxiliary vessels, which may be converted into merchantmen for use in the overseas trade during the war in Europe, or like emergencies. The bill provides that such vessels shall be acquired by the Panama Steamship and Railway Co., a Government owned concern, and that the company shall operate them in the U.S. coastwise trade, or between U.S. ports and those of Central and South America, and in the overseas trade, in the discretion of the President. It is further provided that vessels may be taken from the navy and put into merchant service, and transferred back to the navy. To provide funds for this purpose, the President is authorized to sell $30,000,000 of the bonds issuable under the law on account of the Panama Canal.

The mainspring of the project was the recent admission by the Hamburg American Line and the North German Lloyd, that they were willing to consider any reasonable offer for their vessels which are held at various ports in the U.S. Later, it transpired that some little difficulty might arise should the U.S. purchase these vessels, and some friendly conversations have taken place between the U.S. authorities and the British Ambassador, in which the latter pointed out that under the Declaration of London of 1909, it was stated that the transfer of an enemy's vessel to a neutral flag, effected after the outbreak of hostilities, is void unless it is proved that such a transfer is not made in order to evade the consequences to which an enemy's vessel, as such, is exposed, and that under international law the transfer of German vessels to the U.S. flag does not, under the circumstances, relieve them from the risk of capture by British vessels, but that owing to the friendly relations between the two countries, and Britain's keen desire to do nothing to interfere with such relations, the British Government was prepared to declare that the vessels would not be considered subject to capture under certain conditions. The most important of these conditions would be, that they shall not be used for carrying food, contraband or semi-contraband supplies to points where they would, or could be shipped to Great Britain's enemies, and that some assurance be given that on the close of the war, the vessels shall not be returned to German owners.

In addition to the foregoing steps towards the formation of a merchant marine, the President has signed an order suspending from operation certain sections of the navigation laws, and admitting foreign built merchant vessels to U.S. registration. Several U.S. companies which operate vessels under foreign flags, chiefly British, have signified their intention of transferring their vessels, and a considerable number have recently been transferred.

The C. P. R. s. s. Charmer is undergoing some repairs and a general overhaul at Victoria.

List of Steam Vessels Registered in Canada During July, 1914.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
131204	Deliverance	Liverpool, N.S.	Liverpool, N.S.	1914	110 8	32 0	10 4	280	54	65n.h.p. sc.	Southern Salvage Co., Liverpool, N.S.
134552	Goldfield	Winnipeg, Man.	Selkirk, Man.	1912	75 4	15 9	6 0	56	38	13 " "	Phoenix Brick, Tile & Lumber Co., Winnipeg, Man.
13 222	Homer Warren.	Owen Sound, Ont.	Bay City, Mich.	1901	180 0	28 0	9 0	447	304	73 " "	Peninsula Tug and Towing Co., Wiarton, Ont.
134248	Hudsons Bay Terminals, Lighter, No. 1	Toronto	Toronto	1914	122 0	21 5	9 0	268	129	19 " "	Minister of Railway and Canals, Ottawa, Ont.
134249	Hudsons Bay Terminals, Lighter, No. 2	"	"	1914	122 0	21 5	9 0	268	129	19 " "	" " " "
134365	M & F Dredge No. 14	Sorel, Que.	Collingwood, Ont.	1914	223 0	37 6	13 0	888	332	87 " "	Minister of Marine and Fisheries, Ottawa, Ont.
134366	M & F Dredge No. 15	" "	" "	1914	223 0	37 6	13 0	888	332	87 " "	" " " "
134329	Nipisiquit	Chatham, N.B.	Bathurst, N.B.	1914	75 0	18 4	8 4	94	22	16 " "	Bathurst Lumber Co., Bathurst, N.B

List of Sailing Vessels and Barges Registered in Canada During July, 1914.

No.	Name	Port of Registry	Rig	Where and When Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
131206	Blandford	Liverpool, N.S.	Schr	Liverpool, N.S.	1914	120 9	32 0	11 5	293	Blandford Shipping Co., Liverpool, N. S.
13.287	Charles Boone	St. Catherines, Ont.	Dredge	Welland, Ont.	1914	100 0	40 0	9 7	529	C. S. Boone Dredging & Construction Co., Toronto.
134103	P. D. Co. No. 1	Vancouver, B.C.	Scow	Portland, Me.	....	73 5	28 0	5 2	103	Pacific Dredging Co., Vancouver, B. C.
134173	Wilfred Marcus	Shelburne, N.S.	Schr	Shelburne, N.S.	1914	100 0	25 5	10 0	123	G. V. Buffett, M.O., Grand Bank, Nfld.

Atlantic and Pacific Ocean Marine.

The Allan Line Steamship Co. has contributed £500 to the Prince of Wales fund in connection with the war.

James Bailey, for 35 years Marine Superintendent for the Cunard and Thomson Lines, died at Montreal, Sept. 15, after a short illness.

The s. s. Monkshaven, under charter to the Dominion Coal Co., in the coal trade between Sydney, N. S., and Montreal, ran ashore at Matane, Que., towards the end of August.

Campanello Steamships, Ltd., has been incorporated under the Dominion Companies Act, with $100,000 capital and offices at Toronto, to own, operate and manage steam and other vessels, etc.

The Cunard Line s. s. Aquitania, the latest addition to that company's fleet, was seriously damaged in a collision with the Leyland Line s. s. Canadian, off the Scotch coast recently, while engaged as a British transport.

The Cunard Line s. s. Campania, which has just completed a charter to the Anchor Line, has been placed in service again by the Cunard Line, owing to the withdrawal of the s. s. Aquitania by the British Government for war purposes.

Furness Withy and Co.'s s. s. Shenandoah arrived at St. John, N. B., Sept. 3, and reported having run aground at Little Musquash during a dense fog. She however backed off without assistance. The damage consists of a large hole in her port bow below the water line.

The British s. s. Floriston, outward bound from Montreal for Avonmouth, Eng., was reported Aug. 1, to have been beached near Port Saunders, Nfld., with her bows stove in, after having been in collision with an iceberg in the Belle Isle Strait. It is stated that she is a total loss.

The C.P.R. s.s. Missanabie, a full description of which was given in Canadian Railway and Marine World for August, has been completed, and has successfully undergone a series of trials. She is announced to sail from Liverpool for Montreal, Oct. 7, on her maiden voyage, and from Montreal to Liverpool, Oct. 22.

The C.P.R. has given notice that as the British Admiralty has requisitioned all the vessels of its Pacific fleet, the service across the Pacific Ocean has been suspended until further notice. The C.P.R. had five vessels on its trans-Pacific service, viz.: Empress of Asia, Empress of Russia, Empress of India, Empress of Japan and Monteagle.

Canadian Northern Steamships, Ltd., has chartered the Uranium Steamship Co.'s s. s. Uranium for its service between Canada and Bristol, during the period its vessels the Royal George and Royal Edward have been taken over by the British Government for war purposes. The Uranium is a one class vessel, the fare having been fixed at $55.

The White Star-Dominion Line has announced that it will receive any nationality for third class passage to Liverpool only, except Germans and Austro-Hungarians. In the case of Russians and Finns, each passenger is required to have $35 in his possession to cover the expense of passage from Liverpool to destination.

The White Star s. s. Oceanic ran ashore on the north coast of Scotland, Sept. 9, and became a total loss. All those on board were saved. She was built in 1898, and from her completion in 1899, until she was taken over by the British Government and converted into an auxiliary cruiser on the outbreak of war, she has operated between Southampton, Eng., and New York.

The Department of External Affairs is dealing with the claims of dependents of passengers who were lost in the Empress of Ireland disaster. Claim forms have been supplied to those concerned, and have been transmitted to the secretary of the Empress of Ireland British Relief Fund, through the Secretary of the High Commissioner of Canada, London, Eng.

The Allan Line steamships, Alsatian, Calgarian, Corsican, Ionian and Victorian, having been requisitioned by the British Admiralty for naval auxiliary purposes, the following vessels are being employed on the various routes:—Montreal-Glasgow route, Numidian, Pretorian and Scandinavian; Montreal-Liverpool route, Grampian, Hesperian, Scotian and Tunisian; Montreal-London route, Corinthian and Sicilian; Boston-Glasgow route, Pomeranian and Sardinian; Philadelphia-Glasgow route, Carthaginian and Mongolian. The last sailing of the Allan Line vessels from Montreal this season is scheduled for Nov. 22, by the s.s. Sicilian.

In connection with the recent arrival of the National Transcontinental Ry. car ferry Leonard, at Quebec, Aug. 18, as mentioned in our last issue, it is interesting to note that both her departure from Birkenhead, Eng., and her arrival on this side, were accomplished in perfect safety, and without any untoward incident. The fact that a vessel of such a type, which cannot manoeuvre, and the speed of which is limited, crossed the ocean unmolested, during war time, is evidence that the ocean routes are well controlled. No doubt the departure of the vessel from England was kept quiet, as a London, Eng., paper of Aug. 22, four days after the arrival of the vessel at Quebec, stated that her departure "will probably be somewhat delayed owing to the war."

Maritime Provinces and Newfoundland.

The Department of Public Works will receive, to Oct. 7, tenders for the construction of an extension to the breakwater at Negro's Head, N. B.

At a meeting of shareholders of the Cabot Steam Whaling Co., Ltd., at St. John's, Nfld., Sept. 5, it was resolved that the company be wound up voluntarily, with the directors as liquidators.

The Public Works Department has completed the improvement in the channel of the South River, the most southwesterly of the streams emptying into Murray Harbor, P.E.I., and this is now navigable for about 1½ miles above the entrance up to the bridge in Murray Harbor village, which is the terminus of a branch of the Prince Edward Island Ry. The channel is from 70 to 80 ft. wide, with a depth of 10 ft. at low water. A considerable trade is done with the village, by vessels of from 20 to 75 tons, and by the Three Rivers Steamship Co.'s s.s. Enterprise.

Province of Quebec Marine.

D. Seath, Secretary-Treasurer, Montreal Harbor Commissioners, attended the annual convention of port authorities at Baltimore, Md., Sept. 8 to 10.

The ferry steamboat Le Progres, built for the Corporation of Three Rivers, was given her trial trip Sept. 8, prior to being placed in service.

During August, 1,463 vessel passages were made through the Lachine Canal, against 1,569 in Aug., 1913. The tonnage was 780,352 against 785,865, the tons of cargo 664,313 against 652,601, and the number of passengers carried 28,869 against 39,583.

Canada Steamships Line s.s. Louis Philippe, under construction at Levis, for service between Montreal and Longueuil, was launched during September.

The Dominion Iron and Wrecking Co., Ltd., has been incorporated under the Dominion Companies Act, with $20,000 capital and office at Quebec, to deal in new and second hand bridges, locomotives, iron, steel, etc., contracting and wrecking equipment, steam and other vessels.

The Marine Department, following an investigation into alleged padding of pay lists, has made a number of changes in the Quebec Marine Agency. The accountant, time keeper and a clerk have been dismissed. The District Engineer, P. E. Parent, has resigned and has been succeeded by J. A. Smith, formerly Assistant Engineer.

Lieut. G. O. R. Elliott, R. N. R., heretofore Assistant Marine Superintendent, C. P. R. and Allan Line, Quebec, has been appointed Chief Examining Naval Officer for the port of Quebec, succeeding Commander Attwood, who has returned to England on active service. Lieut. Holloway, R. N. R., who brought the National Transcontinental Ry. car ferry Leonard from England in August, will act as his assistant.

The general and special regulations, approved by order in council, Apr. 20, 1911, for the government of public harbors in the Dominion, have been amended by the additional provision that all vessels drawing less than 14 ft. shall, when navigating the St. Lawrence River between Lanoraie and Varennes, either up or down bound, use the channel known as the north or Repentigny channel, unless they desire to stop at points on the ship channel, in which case that channel may be used.

A collision occurred on Sept. 18, at the Beaujeu Banks, about a mile below Crane Island, 25 miles below Quebec, between the Dominion Coal Co.'s s.s. Lingan and the Dominion Government s.s. Montmagny, sinking the latter vessel, and occasioning the loss of 15 lives. The Montmagny was carrying the wife of the lighthouse keeper at Belle Isle with her seven children, and the wife of the lighthouse keeper at Flower Island with her five children, all of whom were lost, together with the second officer of the vessel, who was attempting rescue. The Montmagny was built at Sorel, Que., in 1909, and not at Paisley, Scotland, as mentioned in the daily press. She was screw driven by engine of 148 n.h.p, and her dimensions were: length 212.6 ft., breadth 34.8 ft., depth 19.5 ft.; tonnage, 1,269 gross, 723 register. The s.s. Lingan is owned by Furness, Withy and Co., and is under charter to the Dominion Coal Co. She was built at Middlesbrough, Eng., in 1912, her dimensions being: length 388¼ ft., breadth 52 ft., depth 29¾ ft., with a carrying capacity of 7,600 tons, and speed of about 12 knots.

Ontario and the Great Lakes.

The first cargo of the present season's grain crop was brought down from Fort William, Aug. 27, by the C. P. R. s. s. Athabasca, for Jas. Richardson and Sons, Ltd., of Kingston.

The U. S. Government is reported to have awarded a contract to the Reid Wrecking Co. of Sarnia, for raising lightship No. 88, which was wrecked in the Great Lakes storm of November, 1913.

The Dominion Government s. s. Lambton, while at Fort William recently, took on ma-

terial for the establishment of a fog horn station at Battle Island, about 100 miles northeast of Fort William, on the north shore of Lake Superior.

Canada Steamship Lines s.s. J. H. Plummer, with package freight from Montreal to Toronto and Hamilton, went aground at Lake Ontario Park, near Kingston, Sept. 18. She was released Sept. 21, and it is stated that the damage is not serious.

The Canadian Shipbuilding and Dry Dock Co., Ltd., has been incorporated under the Ontario Companies Act, with $2,000,000 capital and office at Owen Sound, to build and operate dry docks, steam and other vessels, and to carry on a general shipbuilding and navigation business.

W. Sanford Evans, Chairman of the Government commission appointed to gather statistics relating to the proposed Georgian Bay canal scheme, with the Secretary, J. D. Hepburn, was in Montreal Sept. 10, collecting information from the local business interests.

The Department of Marine has placed a lighthouse on the western extremity of the Main Duck Island in Lake Ontario. It is an octagonal tower with sloping sides, of reinforced concrete construction, 80 ft. high from the base to the lantern vane. The light is of 100,000 c.p. of the third dioptric order, flashing every 10 seconds.

It is reported from Fort William that S. Buchanan, Superintendent. Upper Lake Service, C.P.R., has stated that the company has booked sufficient business to warrant the operation of its vessels on Lakes Superior and Huron until well on in December. In previous years the C.P.R. has suspended operations on the Great Lakes generally in November.

The Board of Railway Commissioners has amended its regulations governing the operation by railway companies of draw, swing or bascule bridges over navigable waters, to provide that the signal to be given by a steamboat, to have the swing opened on the Canadian Canal at Sault Ste. Marie, shall be three long, followed by two short, blasts of the whistle.

Following on the resignation of H. Foster Chaffee, Passenger Traffic Manager, Canada Steamship Lines, Ltd., Montreal. John F. Pierce, Assistant General Passenger Agent, has been given jurisdiction over all matters pertaining to passenger business, reporting to W. E. Burke, Assistant Manager. The position of Passenger Traffic Manager has been abolished for the present.

The s. s. Forest City, which has been operating in the neighborhood of Port Arthur and Fort William in a local passenger traffic during the summer, was damaged by colliding with the bank in the Mission River, Sept. 5, and while being tied up was further damaged by striking a sunken pile, both paddle boxes being smashed. She has been docked at Port Arthur, where she will be laid up for the winter, when repairs will be undertaken.

The U. S. Lake Survey reports the levels on the Great Lakes in feet above tidewater for August, as follows,—Superior 602.76; Michigan and Huron 580.64; Erie 572.59; Ontario 246.33. Compared with the average August levels for the past 10 years, Superior was 0.10 ft. above; Michigan 0.42 ft. below; Erie 0.12 ft. below, and Ontario 0.44 ft. below. It was anticipated that during September, Superior would be 0.1 ft. higer; Michigan and Huron 0.2 ft. lower; Erie 0.3 ft. lower and Ontario 0.4 ft. lower.

W. Livingstone, President of the Lake Carriers' Association, Detroit, Mich., has issued a notice to captains of vessels controlled by the association, directing a more rigid observation of the rule adopted by the association last year, requiring vessels to make a definite inside course while westbound, and an outside course when eastbound, in order to avoid the danger of collision in foggy or thick weather. He states that complaints continue to be received that vessels are disregarding this rule, and points out that every master is expected to observe it to the letter in all weathers.

The Temiskaming Navigation Co., Ltd., Haileybury, is being wound up, by an order of the court, with J. Hardy, Toronto, as interim liquidator. The company was incorporated under the Ontario Companies Act, with $99,000 capital, and head office at Toronto, in 1906. It is reported that of the capital stock, $50,400 was subscribed and fully paid up. There are at present $28,000 of overdue debts, and the immediately realizable assets amount to $7,000. The other assets which cannot be realized at once consist of vessels, real estate and other goods. The company operated the steamboats Jubilee, Meteor, Silverland and Temiskaming.

The Lake Nipissing Shipping and Transportation Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital, and office at Toronto, to own and operate steam and other vessels and to carry on a general navigation business. This company has been formed to take over the four vessels formerly operated by the French River and Nipissing Navigation Co., Ltd., viz.:—Elgin L. Lewis, Highland Belle, Northern Belle, and Dundonald, full details of which were given in our last issue. The President of the company is F. E. Macdonald, the Secretary-Treasurer, H. H. R. Macdonald, and J. W. Bain is a director, all of Toronto.

The s.s. William Henry Mack, which was purchased from the Jenkins Steamship Co., Cleveland, Ohio, by Lake Commerce, Ltd., Toronto, recently, has been transferred to the Canadian register, and renamed Valcartier. She was built at Cleveland in 1903, of steel on the channel system, with steel tank top where no ceilings are fitted, five bulk heads, three of which are watertight, steel boiler house, complete electric lighting plant, and steam pump wells. She is equipped with triple expansion engines with cylinders 20, 33½ and 55 ins. diar. by 40 ins. stroke, 1,170 i.h.p. at 85 r.p.m., supplied with steam by two Scotch boilers, 12 ft. 10½ ins. diar. by 13 ft. long, with four furnaces, having 108 sq. ft. grate area, 4,229 sq. ft. heating surface, working pressure of 175 lbs. Her dimensions are: length 354 ft., breadth 48 ft., depth 28 ft.; tonnage, 3,781 gross, 2,923 register. The vessel left Fort William with her first load of grain under her new ownership, Sept. 17, for Port McNicoll. J. J. Burke is agent for the company at Fort William.

The ice breaking steamship J. T. Horne, owned by James Whalen, Fort William, left there Sept. 8, for Montreal, from whence, it is reported that she will be taken to Europe. It is stated that she has been acquired by the Russian Government, for $168,000, and that she is to be utilised in Russian waters in conjunction with the icebreaker Ermack. She was built at Port Arthur in 1913, of steel, with steel boiler house, and the hull is divided into five bulkheads, three of which are watertight. There is a complete electric light plant, and she is equipped with triple expansion engines with cylinders 18, 30 and 48 ins. diar. by 40 ins. stroke, 1,000 i. h. p. at 130 r. p. m. Steam is supplied by one Scotch boiler 15 ft. 4½ ins. diar. by 11 ft. 5 ins. long, 3 furnaces with a grate area of 75 sq. ft., and a total heating surface of 2,941 sq. ft., working pressure 185 lbs. per sq. in. Her dimensions are, length 114 ft., breadth 28 ft., depth 16 ft.; tonnage, 428 gross, 291 register. She has been used as a tug, icebreaker and fire tug in Thunder Bay.

Manitoba, Saskatchewan and Alberta.

The steamboat Mont Cashel, owned by E. D. Moore, Winnipeg, was practically destroyed by fire, at Winnipeg, Sept. 9. It is believed that the fire was the work of incendiaries. It is stated that the vessel will probably be rebuilt in readiness for operation next season. She was built at Winnipeg in 1912, and was screw driven by engine of 60 n. h. p. Her dimensions were, length 147.8 ft., breadth 28.5 ft., depth 11 ft.; tonnage 508 gross, 346 register.

A press report from Winnipeg states that the construction of two large docks on the Red River, at Winnipeg, will be started in the immediate future by the Dominion Gov-

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during August.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	676	9,515	10,191
Grain	"	Bushels	1,239,632	997,192	2,236,824
Building stone	"	Short tons			
Flour	"	Barrels	347,460	1,000,940	1,348,400
Iron ore	"	Short tons	4,251,419	1,641,848	5,893,267
Pig iron	"	"			
Lumber	"	M. ft b.m.	3,557	63,136	66,693
Silver ore	"	Short tons			
Wheat	"	Bushels	2,189,217	1,998,114	4,187,331
General merchandise	"	Short tons	18,479	20,314	38,793
Passengers	"	Number	3,491	5,507	8,998
Coal, hard	Westbound	Short tons	54,107	238,952	293,059
Coal, soft	"	"	275,440	1,808,341	2,083,781
Flour	"	Barrels			
Grain	"	Bushels			
Manufactured iron	"	Short tons	11,477	20,314	31,791
Iron ore	"	"			
Salt	"	Barrels	1,302	91,475	92,777
General merchandise	"	Short tons	57,198	94,796	151,994
Passengers	"	Number	4,096	5,628	9,724
Summary.					
Vessel passages		Number	939	2,049	2,988
Registered tonnage		Net	2,931,303	3,868,652	6,799,955
Freight—Eastbound		Short tons	4,400,632	1,959,822	6,360,454
" —Westbound		"	308,408	2,176,124	2,574,532
Total freight		"	4,709,040	4,135,946	8,934,986

ernment, and that plans have been approved. They will be located respectively at the foot of Notre Dame Ave., and at Rover St. The first named will be 357 by 30¼ ft., and the latter will be 351 by 30¼ ft. They will be of the open pile type with 5 ft. centres and the piles will go down 30 ft. to rock. When the docks are completed they will be handed over to the local Harbor Commission.

British Columbia and Pacific Coast Marine.

The Northern Dredging Co., Ltd., Vancouver, has given notice of an assignment to R. Forrester, for the benefit of its creditors.

The C. P. R. s. s. Otter was considerably damaged by fire in her engine room, while lying at her wharf at Victoria, Sept. 7. She had not been in service for a few months, and had just returned from Vancouver with a cargo of coal.

Dredging is in progress at the mouth of the Courtenay River, Courtenay, under the superintendence of District Engineer Lambert of the Public Works Department. The Dominion Government granted $22,000 for the work recently.

The Burrard Inlet Gravel and Dredging Co., Ltd., has been incorporated under the British Columbia Companies Act, with $10,000 capital and office at Vancouver, to carry on a general contracting business, and in connection therewith to own and operate steam and other vessels.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince George, which, on the outbreak of war, was requisitioned by the British Admiralty, and was arranged to act as a hospital ship, has been released, and as soon as the necessary changes are made will be returned to her ordinary service.

The contract for repairs to the C.P.R. s.s. Princess Victoria, which was damaged in collision with the Alaska Pacific Navigation Co.'s s.s. Admiral Sampson, has been awarded to Yarrows, Ltd., Esquimalt. It is stated that about 16 bow plates will have to be renewed and a section of the stem replaced. The vessel is at present in the dry dock at Esquimalt.

The G. T. Pacific Coast Steamship Co.'s s. s. Prince Albert, which was wrecked on Butterworth Rock, towards the end of August, is reported to have been abandoned as a total loss. C. H. Nicholson, General Manager of the company, who returned from the wreck, Sept. 1, is reported to have stated that she had a list of 50 degrees, and at high tide was practically awash. She was formerly known as Bruno, and was built at Hull, England, in 1892, and purchased by the G. T. P. Coast Steamship Co. on the formation of the company, when her name was changed. She was screw driven by engine of 170 n. h. p. Her dimensions were, length 232 ft., breadth 30 ft., depth 14 ft.; tonnage, 1,015 gross, 587 register.

The C. P. R. s. s. Princess Victoria and the Alaska Pacific Navigation Co.'s s.s. Admiral Sampson, were in collision off Point No Point, about 20 miles from Seattle, Wash., Aug. 26, the latter vessel sinking and 8 of the crew and 3 passengers losing their lives. One of the passengers reported among the lost was the wife of G. Banbury, clerk, Grand Trunk Pacific Coast Steamship Co., Seattle. The Princess Victoria has been libelled for $670,000, and the C. P. R. filed a claim in the Federal Court at Seattle that this is excessive. The court appointed appraisers to value the vessel, and this was fixed at $285,520 for the vessel and $705.10 for the cargo. The C. P. R. states that the accident was due to the excessive speed of the Admiral Sampson in a fog, and claims that the Princess Victoria has been damaged to the extent of $20,000, which the Alaska Pacific Navigation Co. should pay, with such other damages as passengers and owners of freight may claim.

Wreck of Grand Trunk Pacific Coast Steamship Co.'s s.s. Prince Albert.—The judgment of the Wreck Commissioner's court, presided over by Capt. J. D. Macpherson, with Capts. J. Gosse and H. Denyer as nautical assessors, at Vancouver, B. C., Sept. 8, re the wreck of the G.T. Pacific Coast Steamship Co.'s s.s. Prince Albert, near Masset, recently, stated that Capt. J. J. Flood, the officer in charge, showed an utter want of all the characteristics required for such a responsibility, and he must have known, from his long experience, that he was in dangerous waters. His certificate of competency as the master of a passenger vessel in the coasting trade was suspended for three months. Capt. D. McKenzie, the master, was justified, under the existing circumstances, for retiring to rest, but he was severely reprimanded for not leaving instructions to be called before a certain specified point was reached. The court also found that, after the accident, everything was done that was possible for the preservation of life and property, and that the discipline was excellent.

Navigation Aids in Hudson Bay.—It is announced from Ottawa that the Government programme of work in connection with the navigation of Hudson Bay, for this year, covers the preparation for the erection of three wireless telegraph stations in the Strait and at the bay entrance, so as to give continuous communication from the open ocean to Port Nelson and Fort Churchill. The actual construction of these sections will, however, not be undertaken until next year. The Government s. s. Acadia is engaged in charting the Strait, and other Government vessels are taking soundings and doing general survey work for the harbors at Port Nelson, Fort Churchill and at the mouth of the Nottaway River. Two lighthouses are to be commenced this year, one on either side of the entrance to the Port Nelson harbor, and a third will be built on a newly charted shoal in the bay.

The Marine Department has issued a notice to mariners cautioning them that Government vessels are sometimes engaged in sweeping operations off ports in Canada, and whilst so engaged they work in pairs connected by a wire hawser, and are consequently hampered to a very considerable extent in their manoeuvring powers. With a view to indicating the nature of their work they show a black ball at the foremast head and a similar ball at the yard arm, or where it can best be seen, on that side on which it is dangerous for vessels to pass. For mutual safety, other vessels, whether steamers or sailing craft, should endeavor without violating the rule of the road, to keep out of the way of vessels flying this signal, and should especially remember that it is dangerous to pass between the vessels of a pair.

A dipper dredge for the Randolph Macdonald Co., Ltd., of Toronto, was launched recently at Welland, Ont., by M. Beatty & Sons, Ltd. It is of the boom and A frame type, with a 3½ cu. yd. dipper to work in 30 ft. of water. The steel hull is 107 ft. long, with 36 ft. beam. It is 9¼ ft. deep at the bow and 8¼ ft. at the stern. The boiler is of the Scotch marine type and is of ample size to furnish steam for the entire plant when working under heavy load. The bow anchors are made of steel plating, 28 by 30 ins. by 55 ft. long, with a circular reinforcement on the inside, forced into place and firmly rivetted. All the sheaves and bearings, as well as the anchor points, are of open hearth steel castings. The dredge is expected to be completed early in the autumn.

The Kiel Canal, of which so much is heard during this war, runs from the mouth of the River Elbe, in the North Sea to the fjord of Kiel, in the Baltic Sea, about 60 miles. Its normal width is 335 ft. at the surface and 144 at the bottom, with a depth of 36 ft. New twin locks have been built alongside the old ones at each end. They have an available length of 1,082.6 ft. and width of 147.6 ft. Intermediate gates may be used to cut off a chamber 328 ft. long. The locks at Panama are only 1,000 by 110 ft. The reconstruction of the Kiel canal cost $55,000,000.

Telegraph, Telephone and Cable Matters.

The Canadian Northern Telegraph Co. has opened offices at Westside and Steep Rock, Man., and Hearne, Sask.

W. J. O'Connor, night chief operator, C. P. R. Telegraphs, Ottawa, for the last ten years, died there, Sept. 8, aged 42, after about a month's illness.

The Great North Western Telegraph Co. has opened offices at Thamesville, Ont., and at Cedars Station, Lake St. Joseph Hotel, Valcartier Camp and Valcartier Rifle Ranges, Que., and has closed its various offices which are only opened for the summer season.

The Pacific Cable Board's cable between Canada and Australia, was reported to have been severed in the neighborhood of Fanning Island, early in September. The actual cause of the break has not transpired, but it is believed to have been cut by one of the German cruisers in the Pacific which has not yet been located. It was announced that the cable would be repaired and communication restored as soon as possible.

A London, Eng., press dispatch of Sept. 18, stated that the Postmaster General, who has been in communication with the cable companies regarding the heavy charges falling upon the commercial community on account of the compulsory insertion of full addresses and signatures in messages, hopes to make an arrangement which will substantially reduce the cost of cables to countries outside the European system.

At the annual meeting of the Marconi Wireless Telegraph Co. in England recently, the report for the year showed a gross profit of $1,227,915. Final payments of the dividend of 10% on both classes of shares have been made for the year. Favorable mention was made of the progress of the Canadian and other companies, and also of the general development of the wireless compass or direction finder, some details of which have already been given in Canadian Railway and Marine World.

The Dominion Government has taken over the completed wireless telegraph stations at Port Nelson in Hudson Bay, and at Pas, Man. These stations were erected under contract by the Marconi Wireless Telegraph Co., which was to operate them for one year. This period having expired, the stations have been placed under the jurisdiction of the Naval Department. It is announced that wireless telegraph stations are to be erected at Maunsel Island, at the western extremity of Hudson Strait; at Ash Inlet, about the centre of the Strait; and at Button Islands, at the Atlantic end of the Strait.

The British House of Commons has approved an agreement with the Canadian Government relating to a reduction in the cable rates to the West Indies in return for a subsidy of £16,000 a year for ten years, payable in equal shares by the British and Dominion Governments, and for the continuance for the same period of subsidies amounting to £10,300 a year to the West Indies Colonies Co., which undertakes to reduce the cable rates now in force. There will be a flat rate between any of the colonies and the United Kingdom of 2s. 6d. a word and 1s. 6d. a word to Canada, in place of rates ranging from 3s. to 5s. 6d. and 2s. 2½d. to 4s. 9½d. Provision is also made for a reduction of 50% in charges for Government and press messages, deferred cables, daily news bulletins, etc.

It is reported to have been announced from Ottawa, presumably by the military authorities, that it is difficult to secure proficient telegraph operators for war service in Europe, owing to the difference in code. Operators claim that what is termed as the continental code can be mastered in about 10 days, so that that difficulty can easily be overcome. While this matter is to the front, it is expected that an impetus will be given to the question of displacing the code in use on this continent, in favor of the continental code, which is said to be more simple and speedy, and thus bring the whole telegraphic system under the one code. The continental code is used for wireless telegraphy and for cable messages, and also over the land lines operated by the Pacific Cable Board under lease from the C.P.R., while occasional direct cable communication from main C.P.R. centres with Great Britain is also made by the same code. The question of the change is under discussion by the various companies in the U.S., and it does not appear that the difficulties are too great to overcome.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Westside, Man., and Hearne, Sask.

The Canadian Ex. Co.'s operations for June, cover receipts $261,901; exp. priv. $113,178; operating revenue $148,722; operating expenses $129,504; net revenue $19,218; taxes $3,000; operating income $16,218, against $276,922 receipts; $121,473 exp. priv.; $155,448 operating revenue; $130,814 operating expenses; $24,636 net revenue; $3,000 taxes; $21,634 operating income for June, 1913.

With reference to the paragraph in our last issue, relating to the liquidation of the British Columbia Express Co., we are officially advised that owing to the advance of railway construction in the territory covered by the company, the Government mail contract was given up, and the stage equipment sold to the Inland Express Co. Otherwise the company is continuing business as before and carrying mails for the Inland Ex. Co. for the river part of the journey. Jas. C. Shields, Ashcroft, B. C., and J. T. Robinson, Kamloops, B. C., control the Inland Ex. Co.

The Inland Express Co., which is reported to have taken over a portion of the British Columbia Ex. Co.'s business, was incorporated under the first mentioned name in Dec., 1913, with the object of taking over the business of J. C. Shields and J. T. Robinson, carried on under the name of the Imperial Express Co. It has an authorized capital of $50,000, and office at Ashcroft, B. C. It is stated that the company receives a subsidy of $12,000 a month from the Dominion Government, and in addition $5,000 a month for the carriage of passengers and freight, and also that the company has taken over the stage, express and passenger business of the British Columbia Ex. Co. There are some matters in dispute between the two companies, and litigation is in progress between the parties. It is alleged that the British Columbia Ex. Co. agreed to cease business as an express carrier. The officers and directors of the Inland Ex. Co. are:—President, J. C. Shields; Vice President, J. T. Robinson; Secretary, W. H. Edmunds; Superintendent, Leslie Cameron; other director, F. J. Fulton, K.C.

The Canadian Northern Ex. Co.'s total receipts from operation for June were $84,623; express privileges, $32,156; total operating revenue, $52,467; operating expenses, $35,456; net operating revenue, $17,011; taxes, $6,389; operating income, $10,621, against $87,203 total receipts from operation; $34,051 express privileges; $53,151 total operating revenue; $32,200 operating expenses; $20,950 net operating revenue; $631 taxes; $20,318 operating income for June, 1913. Aggregate total receipts from operation for 12 months ended June 30, $971,947; express privileges, $374,704; total operating revenue, $597,243; operating expenses, $402,993; net operating revenue, $194,249; taxes, $21,157; operating income, $173,092, against $957,275 aggregate total receipts from operation; $372,602 express privileges; $584,672 total operating revenue; $365,833 operating expenses; $218,839 net operating revenue; $6,316 taxes; $212,522 operating income, for same period 1912-13. The mileage of steam roads over which the company operated for the year ended June 30, 1914, was 6,130.77, and other lines 22 miles, against 5,736.67 and 22 for the same period 1912-13.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

John Bertram & Sons Co., Ltd., Dundas, Ont., manufacturers of machine tools, have distributed a wall calendar pad, one sheet for each day.

Babcock & Wilcox, Ltd., Montreal, supplied the marine type boilers for the s.s. Princess Margaret, built recently for the Canadian Pacific Ry., and which was described in our August issue.

Taylor and Arnold, Limited, railway supplies, etc., Montreal, have been authorized by supplementary letters patent under the Dominion Companies Act, to increase their capital stock from $50,000 to $100,000.

Flannery Bolt Co., Pittsburg, Pa., has issued its 1914 catalogue of the Tate flexible staybolt and tools for installation, which is being distributed by Canadian Allis-Chalmers Ltd., Toronto, exclusive agents in Canada.

Independent Pneumatic Tool Co., Chicago and Montreal, has issued circular V, describing its Thor roller bearing piston air drills, pneumatic chipping, calking and flue beading hammers, turbine drills, staybolt drivers, air hose, couplings, etc.

Algoma Steel Corporation, Ltd., announces the discontinuance of its sales office in Montreal, and that all material manufactured by it will be sold through its sales department at Sault Ste. Marie, Ont., to which department all inquiries should be addressed.

The Trolley Supply Co., Canton, Ohio, has issued a 60 pg. catalogue of trolley supplies, including Knutoon trolley retriever, Ideal trolley catcher, Simplex and Peerless trolley bases, Peerless check valve and junior headlight, pressed steel dash headlights, Hollis safety fender and no. 3 detachable fender.

The Electric Railway Improvement Co., Cleveland, Ohio, has leased bonding cars recently to the following:— Des Moines City Ry. Co., Des Moines, Iowa, 2nd car; Bell & Jamison, Los Angeles, Calif., 2nd car; Jamestown Westfield & N.W. Rd., Jamestown, N.Y.; Wilkes Barre & Hazelton Ry. Co., Hazelton, Pa.; Shore Line Electric Ry. Co., Norwich, Conn.

Canadian General Electric Co., Ltd., Toronto, has issued bulletin A4200 on strain insulators and strain clamps, also a catalogue of chloride accumulators and Tudor accumulators for electric railway, lighting and power stations, interlocking switch and signal and telephone and telegraph service; and a small pamphlet illustrating different types of railway condulets, as well as a bulletin on rail bonds and bonding tools containing a minute description of manufacturing methods.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.

Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building. Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto, 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, Counsel, F. King, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, A. F. Dion, Quebec.

Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.

Toronto Transportation Club, W. A. Gray, 143 Yonge St., Toronto.

Western Canada Railway Club, Louis Kon, P. O. Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July and August.

Transportation Conventions in 1914.

Oct. —.—American Association of Dining Car Superintendents, Washington, D.C.

Oct. 12-16.—American Electric Railway Association, Atlantic City, N.J.

Oct. 14-16.—American Association of Railway Surgeons, Chicago, Ill.

Oct. 19-23.—Association of Railway Electrical Engineers, Chicago, Ill.

Oct. 20-22.—American Railway Bridge and Building Association, Los Angeles, Cal.

Nov. 17.—National Association of Railway Commissioners, Washington, D.C.

Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.

Nov. 18.—American Railway Association, Chicago, Ill.

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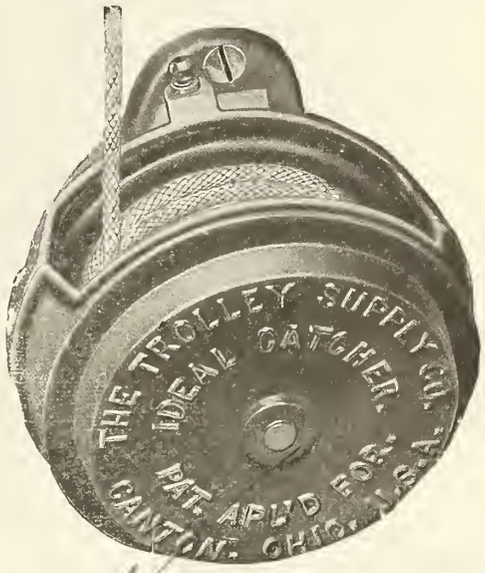

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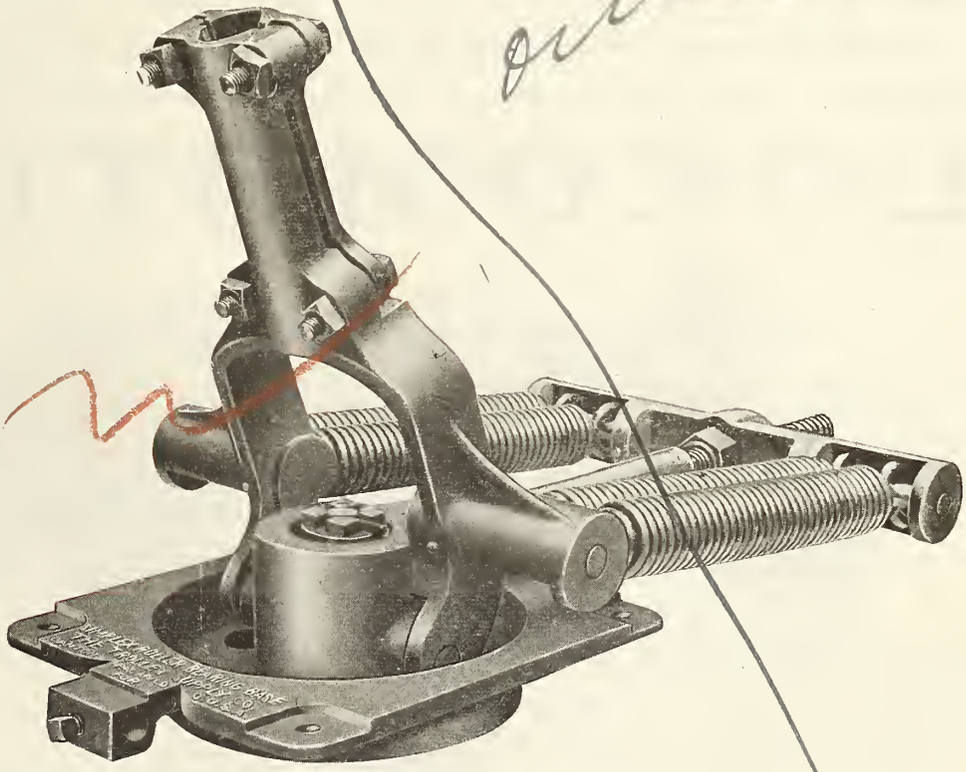

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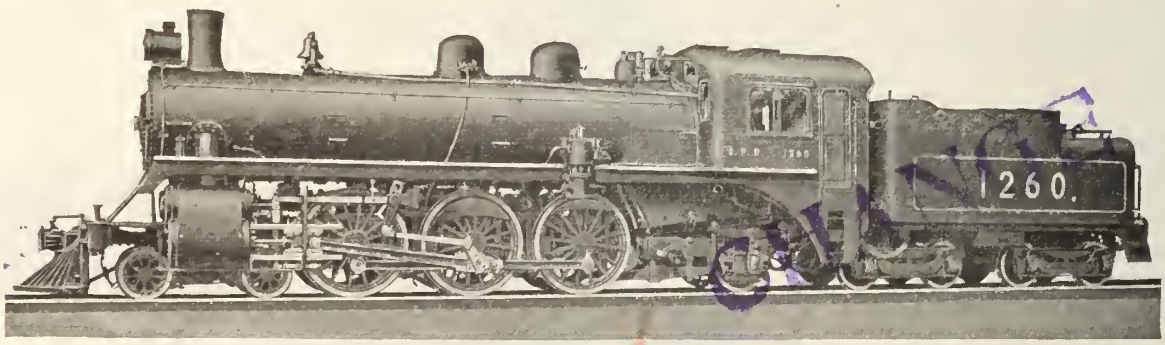

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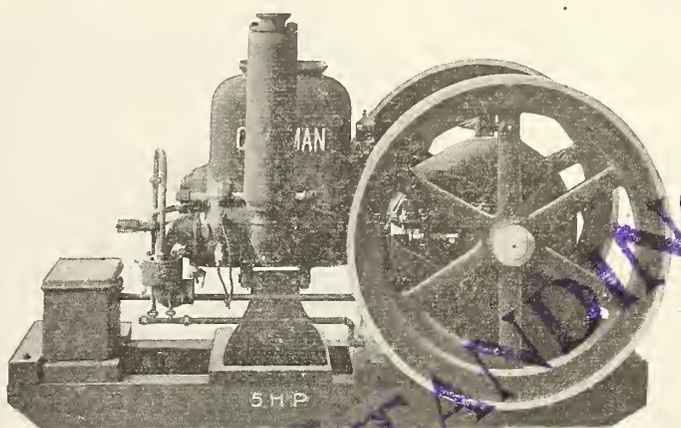

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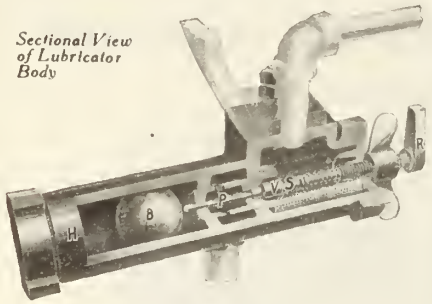

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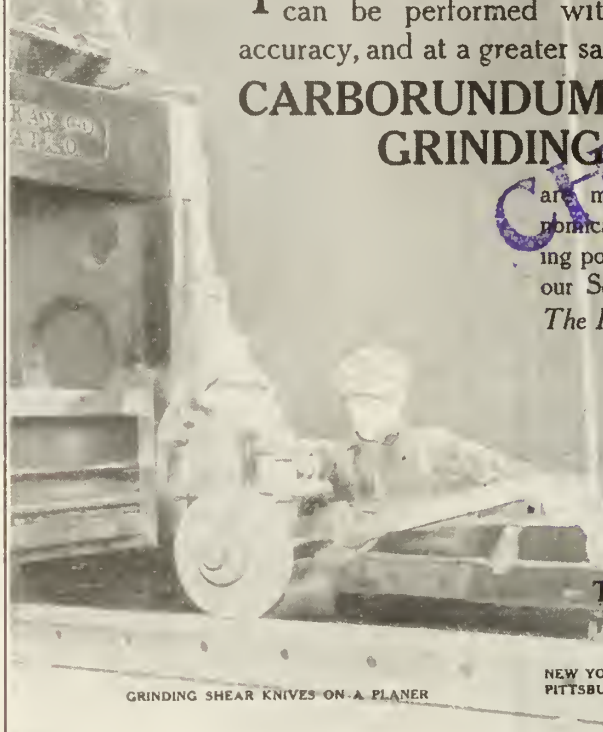

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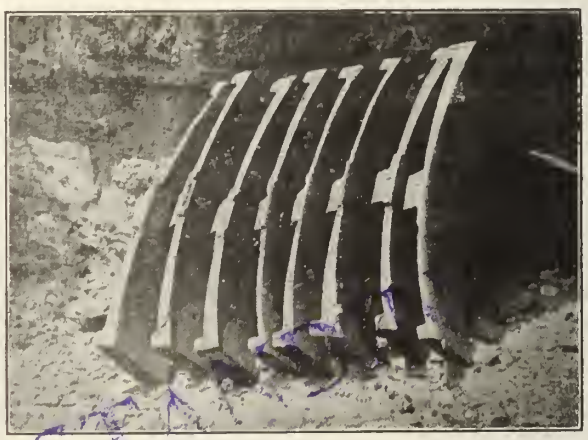

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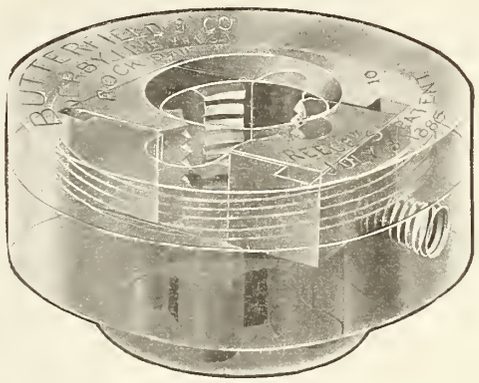

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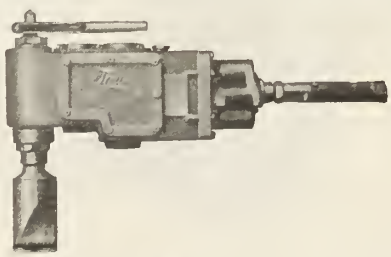

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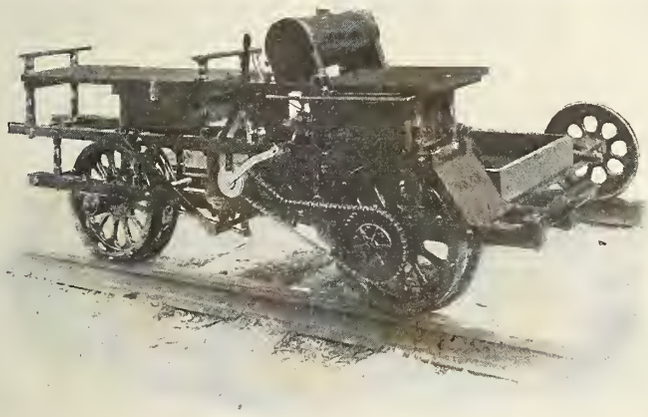

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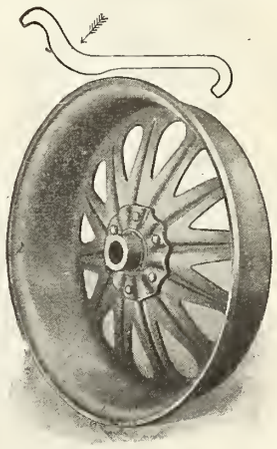

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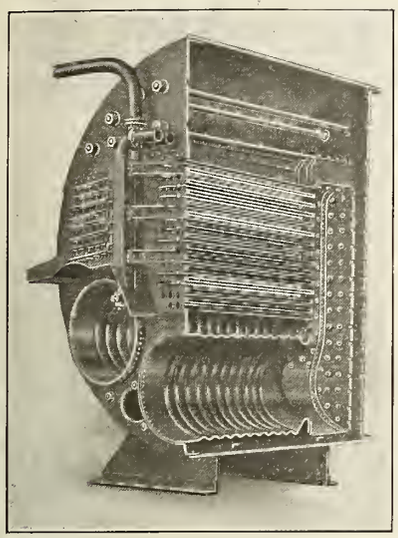

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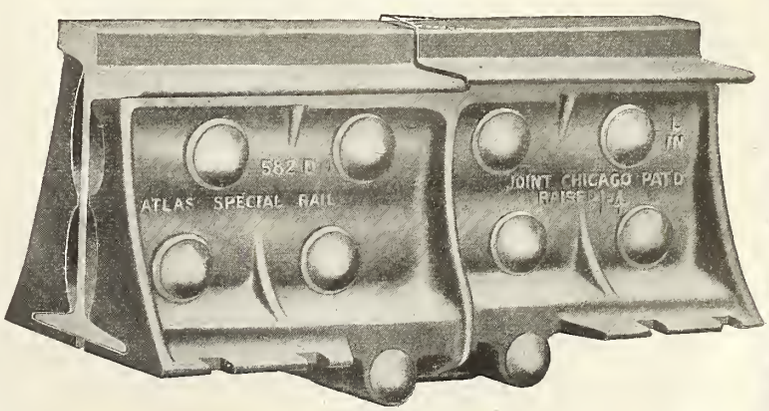

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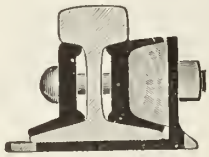
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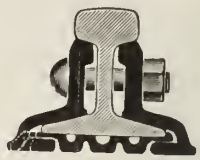
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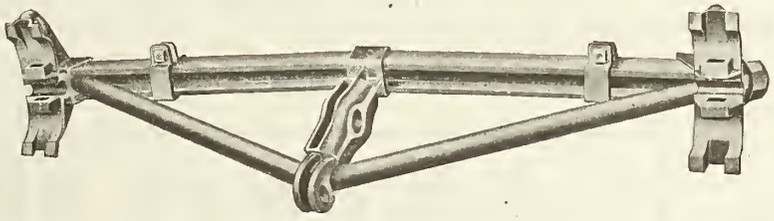

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A HISTORY OF THE PAY-AS-YOU-ENTER CAR

AND ITS LESSON

The following cities are using Pay-As-You-Enter Cars : Chicago City Railway, 839 cars ; Chicago Railways, 1,328 ; Public Service Corporation of New Jersey, 466 ; New York City Railway, 555 ; Third Avenue Railroad, New York, 550 ; International Railway, Buffalo, 200 ; Buffalo & Lake Erie Traction Co., 10 ; Washington Ry. & Elec. Co., Washington, D.C., 100 ; Capital Traction Co., Washington, D.C., 51 ; Municipal Traction Co., Cleveland, Ohio, 180 ; United Rys. Co. of St. Louis, Missouri, 310 ; Portland Ry., Lt. & Pwr. Co., Portland, Ore., 25 ; Columbus Ry. & Lt. Co., Columbus, Ohio, 10 ; Wichita R.R. & Lt. Co., Wichita, Kan., 14 ; Jacksonville Elec. Co., Jacksonville, Fla., 5 ; Dallas Elec. Co., Dallas, Texas, 20 ; Houston Elec. Co., Houston, Tex., 41 ; Northern Texas Trac. Co., Ft. Worth, Texas, 25 ; Ithaca Street Ry., Ithaca, N.Y., 2 ; Peoria Street Ry., Peoria, Ill., 13 ; Urbana & Champaign Ry., Champaign, Ill., 3 ; Mutual Lt. & Water Co., Brunswick, Ga., 4 ; Rochester Ry. Co., Rochester, N.Y., 25 ; Ft. Dodge, Des Moines & So. R.R. Co., 2 ; Muskogee Elec. Trac., Muskogee, Okla., 6 ; Union Traction Co., Dubuque, Ia., 4 ; Topeka Ry. Co., Topeka, Kas., 12 ; United Rys. & Elec. Co., Baltimore, Md., 32 ; Detroit United Ry., Detroit, Mich., 225 ; Cincinnati Traction Co., Ohio, 50 ; Montreal Street Railway, 400 ; British Columbia Elec. Ry., 30 ; Calgary Street Railway, 18 ; Metropolitan Street Ry., Kansas City, Mo., 50 ; Edmonton Radial Ry., 4 ; San Antonio Traction Co., San Antonio, Tex., 6 ; Rockford & Int. Ry., Rockford, Ill. ; Cairo Street Ry. & Lt. System, 6 ; Des Moines City Railway, Iowa, 12 ; Macon Ry. & Lt. Co., Macon, Ga. ; Virginia Ry. & Power Co. ; Columbia Elec. St. Ry. & Lt. & Power Co., Columbia, S.C. ; Aurora, Elgin & Chicago Ry., Chicago, Ill. ; Wichita Falls Traction Co., Wichita Falls, Tex. ; Ottawa Electric Ry. Co., Ottawa ; Bloomington & Normal Ry. & Lt. Co., Bloomington, Ill. ; Corsicana Transit Co., Corsicana, Tex. ; Compania Electrica y de Ferrocarriles, Mexico ; The Milwaukee Elec. Ry. & Lt. Co., Milwaukee, Wis. ; Springfield Street Ry. Co., Springfield, Mass. ; Lynchburg Traction Co., Lynchburg, Va. ; Chicago & Southern Traction Co., Chicago, Ill. ; Calumet & South Chicago Ry. Co., Chicago, Ill.

THE LESSON

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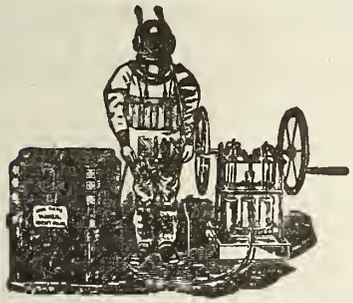

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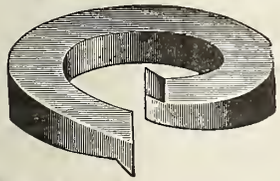

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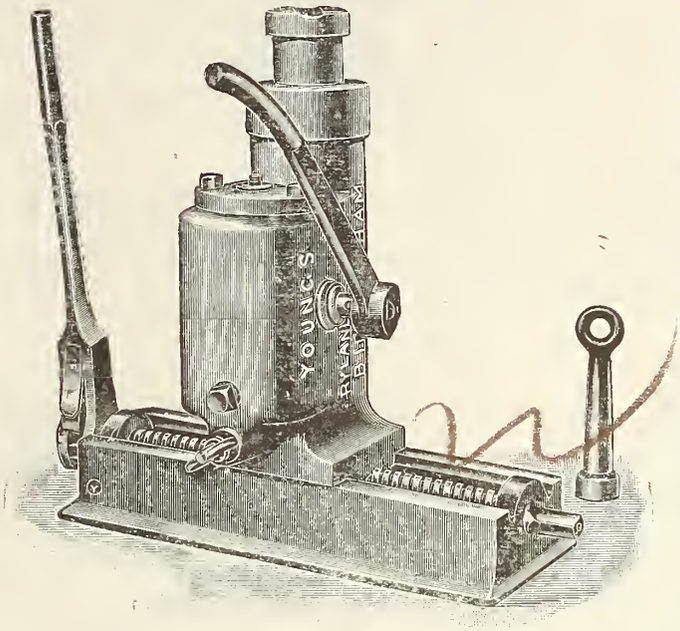

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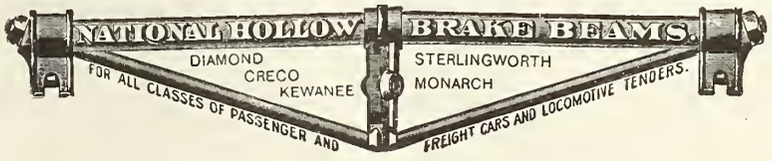

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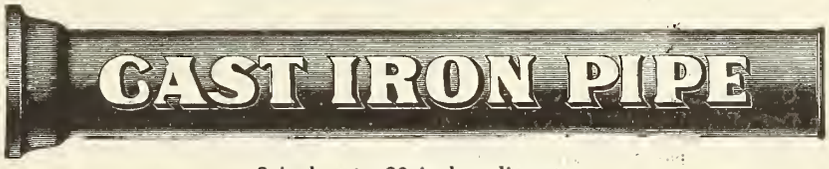

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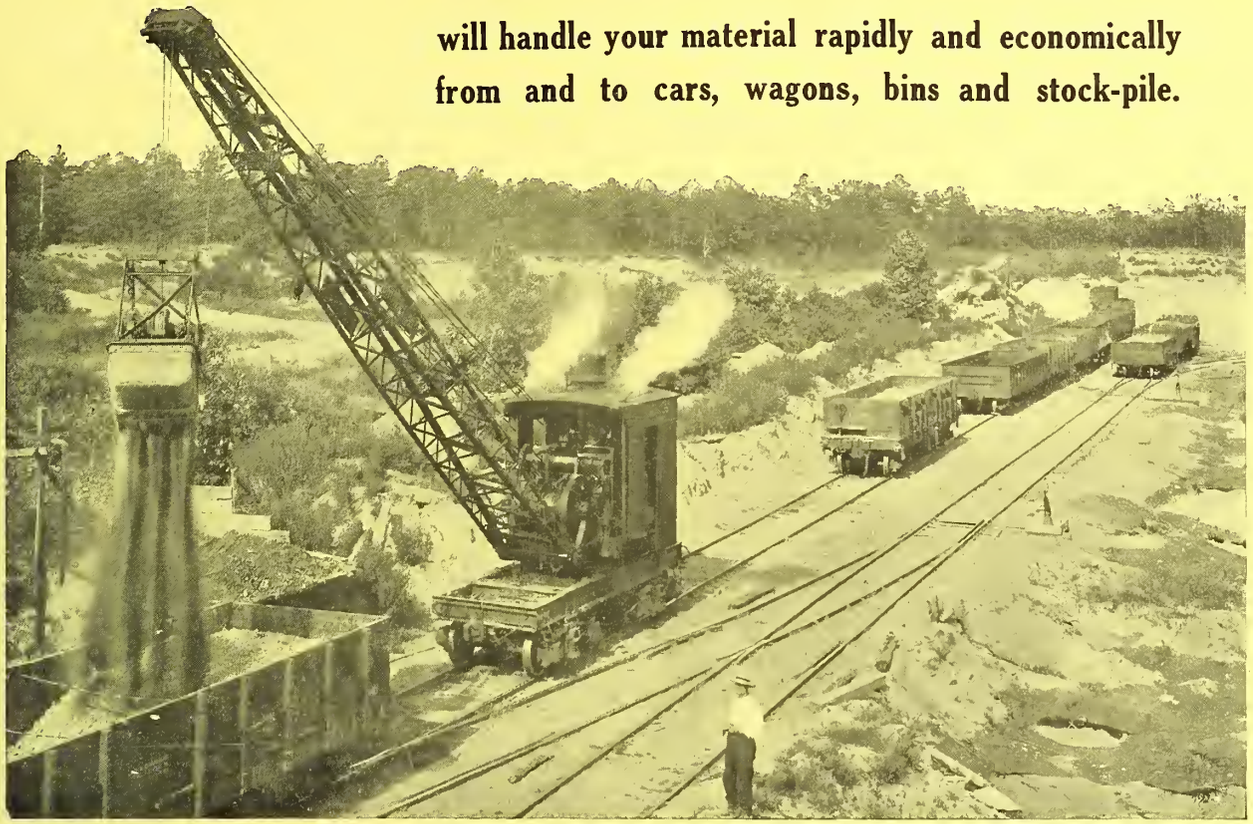
The BROWNHOIST Locomotive Crane

will handle your material rapidly and economically from and to cars, wagons, bins and stock-pile.



15-ton Brownhoist Locomotive Crane with Contractor's type bucket used by the York Sand & Gravel Co., of Toronto.

The Brownhoist Locomotive Crane handles ore, coal, crushed stone, sand, gravel, etc., 60 to 120 tons per hour. And one man operates the crane.

Figure what a saving this would mean in your handling costs, taking the crane and operating expense at $8.00 per day, everything included. Also consider that a Brownhoist crane will work day and night continuously.

And when you use a Brownhoist Locomotive Crane you are not continually troubled with breakdowns. Ask the owners—they will tell you.

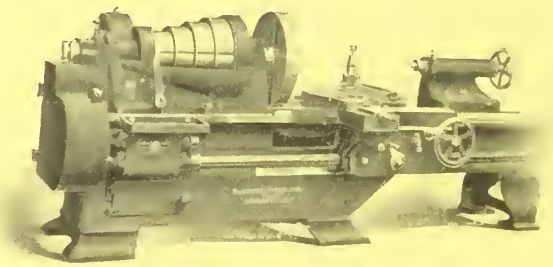
Write for catalog K which shows how and where the crane is used.

THE BROWN HOISTING MACHINERY CO.

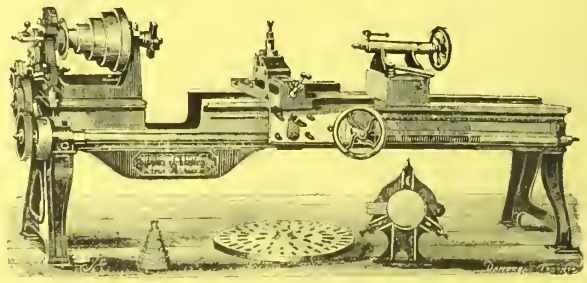
CLEVELAND, OHIO, U.S.A.

Canadian Office, 145 St. James St., Montreal

THE MARCH OF PROGRESS



26″ x 42″ Gap Lathe—1914.



36″ Gap Lathe—1868.

49 YEARS AGO

McKECHNIE & BERTRAM manufactured the first machine tools ever made in Canada on a commercial basis.

Our illustrations graphically show the wonderful advance of half a century in machine tool design.

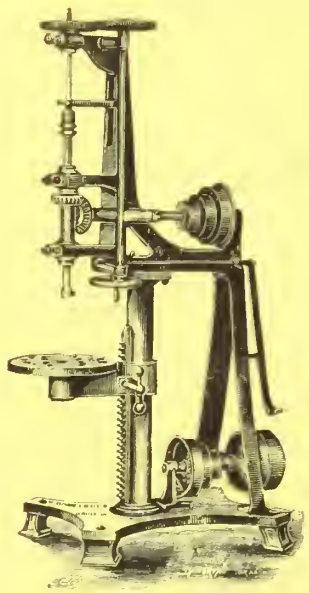
The MARCH OF PROGRESS has made the pioneers of 1865 the leaders in Canadian tools to-day.

CHANGE

Heavy Duty Drill—1914.

OUR RECORD IS YOUR SECURITY

No concern could stand for half-a-century unless its product and its reputation were good—half-a-century of PROGRESS, SERVICE and SQUARE DEALING stands behind



No. 4 Drill—1865.

BERTRAM
MACHINE TOOLS

AND THEIR REPUTATION IS FOUNDED ON THE SOLID ROCK OF

QUALITY

LET US QUOTE YOU ON YOUR REQUIREMENTS

The John Bertram & Sons Co., Limited

DUNDAS, ONTARIO, CANADA

723 Drummond Bldg., MONTREAL

VANCOUVER

Bank of Hamilton Bldg., WINNIPEG

Canadian Railway AND Marine World

ESTABLISHED 1898.

NUMBER 201 — TORONTO, CANADA, NOVEMBER. 1914 — Subscription Rates Page 507

KERITE

DAYS KERITE

KERITE INSULATED WIRE & CABLE COMPANY

NEW YORK CHICAGO

DAYS KERITE

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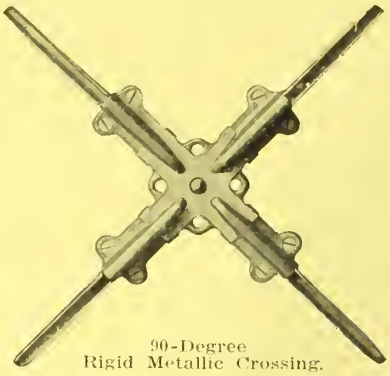
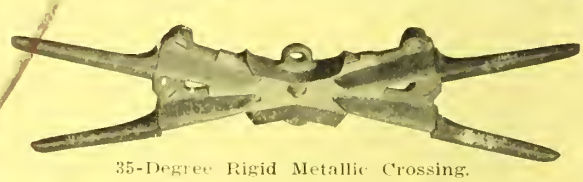
Westinghouse Line Material

Rigid Insulated Crossing for Voltages Up to 750.

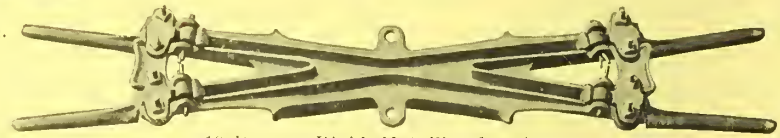
Adjustable Insulated Crossing for Voltages Up to 750.



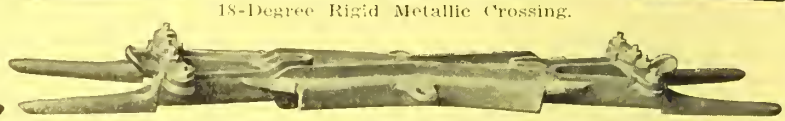
90-Degree Rigid Metallic Crossing.



35-Degree Rigid Metallic Crossing.



18-Degree Rigid Metallic Crossing.



15-Degree Rigid Metallic Crossing.

Adjustable Metallic Crossing.

Carefully worked-out designs with properly distributed materials secure smooth transit of the wheel, and long life for Westinghouse Trolley Crossings.

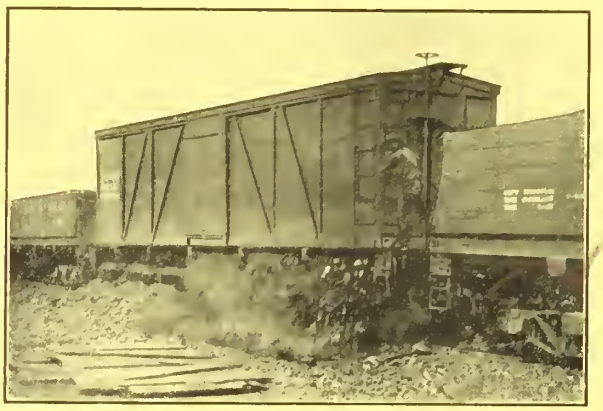
KILL LAST AD.

Canadian Westinghouse Co., Limited, Hamilton, Ont.

TORONTO — Traders Bank Building
MONTREAL — 52 Victoria Square
OTTAWA — Ahearn & Soper, Ltd.
HALIFAX — Telephone Bldg.
FT. WILLIAM — Telfer Bldg.
WINNIPEG — 158 Portage Ave. East
CALGARY — Grain Exchange Bldg.
EDMONTON — Dominion Bldg.
VANCOUVER — Bank of Ottawa Bldg.

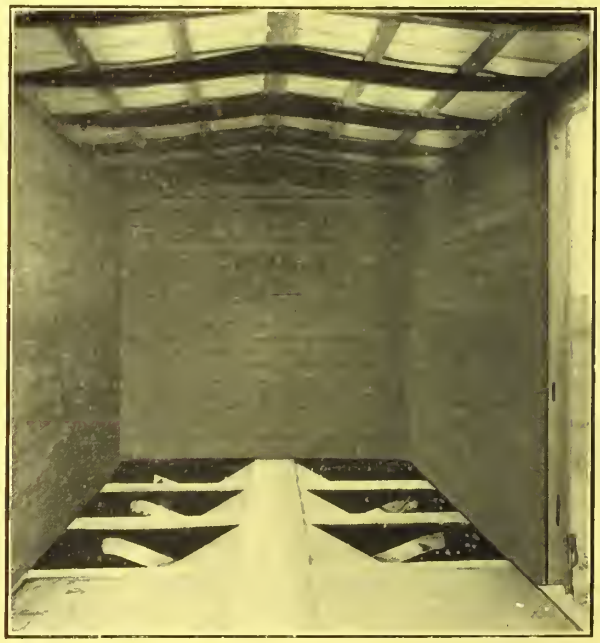
Why Not Dump Coal Out of Box Cars?

— OTIS DUMP CARS —



DUMPING 40 TONS OF COAL AND IMMEDIATELY RETURNED TO SERVICE.

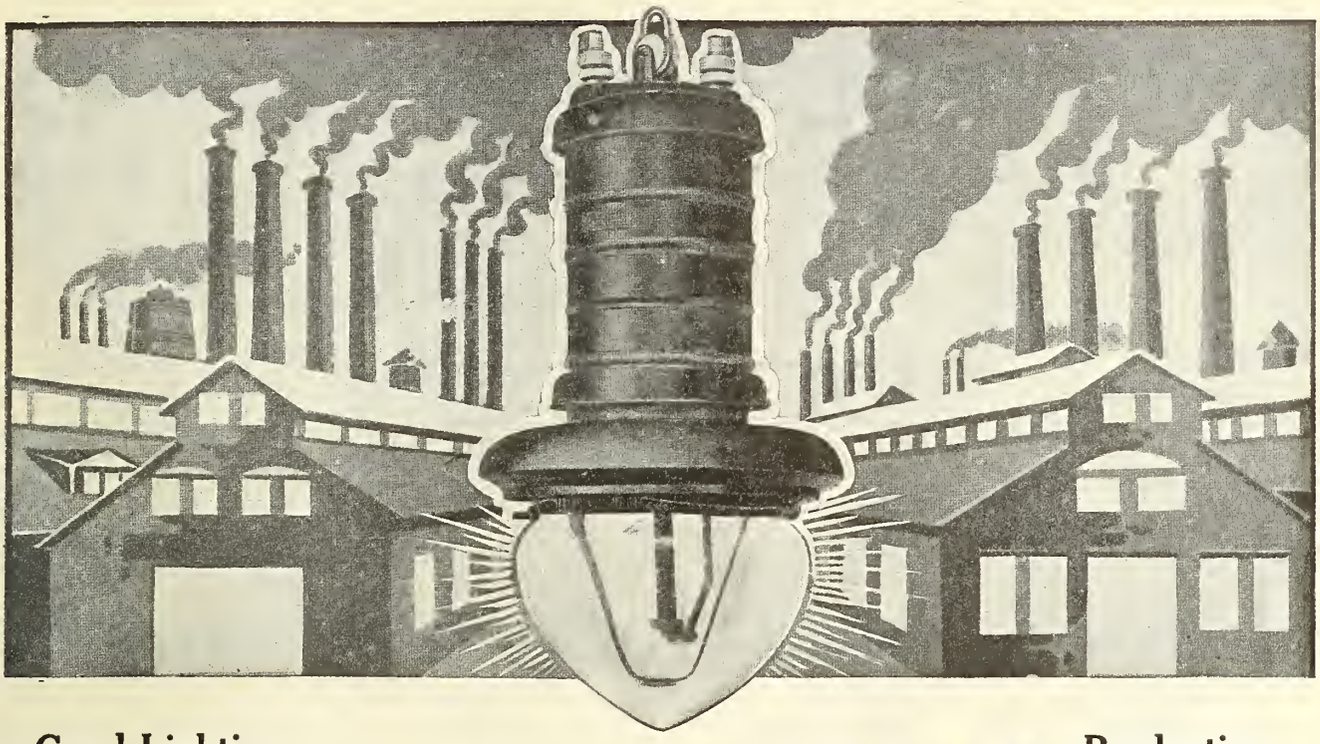
A Practical Level Floor Dumping Box Car For GRAIN COAL SAND CEMENT and General Merchandise



LEVEL FLOOR. ALWAYS READY FOR ANY SERVICE. NO CONVERTING NECESSARY.

WHY NOT INCREASE THE EFFICIENCY OF YOUR BOX CARS BY MAKING A DUMPING COAL CAR OUT OF THEM. TO SAVE TIME AND LABOR DURING THE COAL HANDLING SEASON.

THE HART-OTIS CAR CO., LIMITED : MONTREAL



Good Lighting Can Be Obtained

Production Can Be Increased

By Means of The GE Type W Flame Arc Lamp

LIGHT your plant **well**, so that the men can work as efficiently in artificial light as they can in daylight. With good illumination, accidents, shut-downs, delays, etc., are less likely to occur, and thus production is increased.

Further, in a well lighted plant, surroundings are more congenial and the men turn out better and quicker work.

Where a plant is well lighted, a marked increase in production (from 2 to 15%) is shown over an indifferently lighted plant.

Good lighting enables you to get first-rate working efficiency, 24 hours per day.

The Type W GE Flame Arc Lamp

gives a wide distribution of brilliant light over large areas. It is one of the most powerful lighting units known. The lamp is exceptionally low in maintenance cost. It burns without attention for over 100 hours and even then it is necessary to renew only one electrode.

The absolute reliability of this new lamp insures a continuity of service.

Write for copy of Bulletin Y 210.

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

IN TIMES OF WAR OR PEACE

Bonds are Always a Good Investment

Particularly If They Are GE *Railbonds*

We have ready for distribution a very complete Railbond Bulletin No. 44002. If you have not received your copy, a line to our nearest district office will bring it to you.

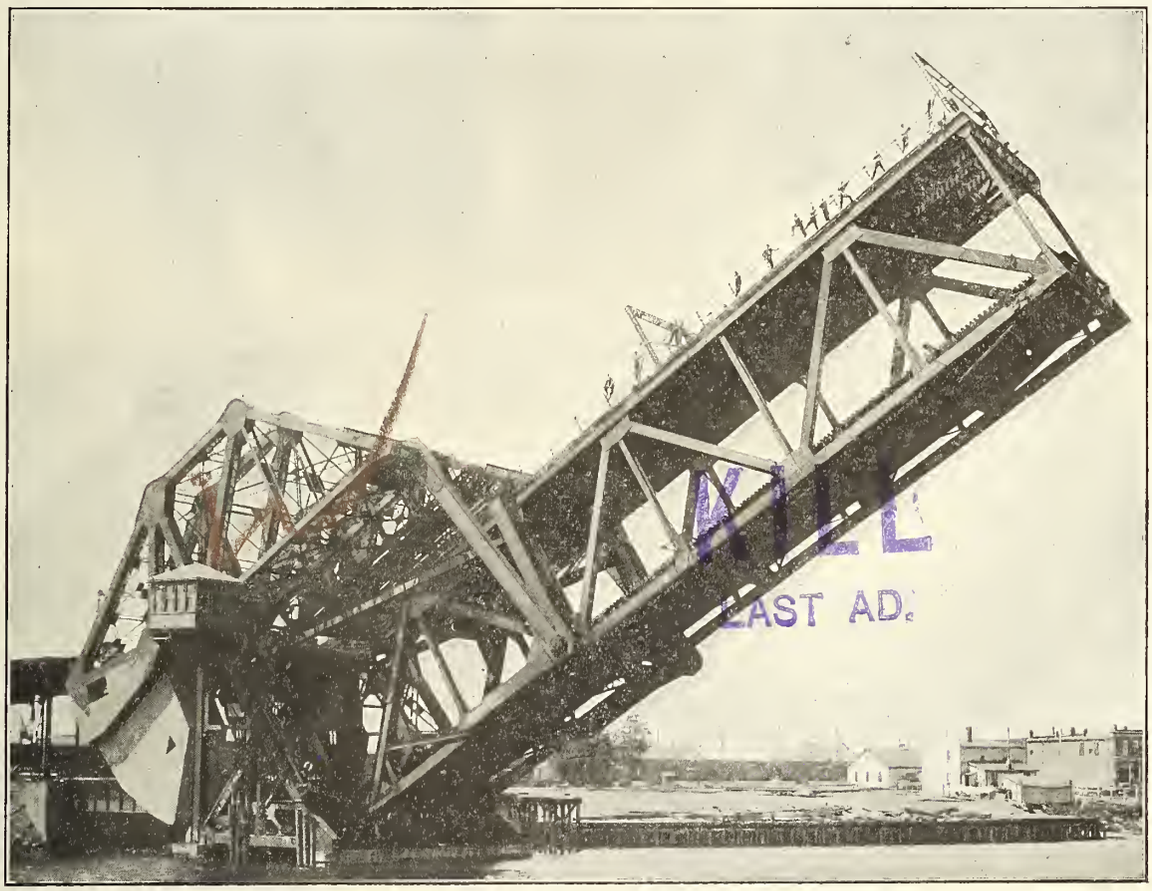
CANADIAN GENERAL ELECTRIC COMPANY,
LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

LARGEST IN THE WORLD

A double track, double deck, bascule lift bridge, 186 ft. span, carrying a double track railway on the lower deck and two street car tracks, roadway and sidewalks on the upper deck.



C. P. R. Bridge, Kaministiquia River, Fort William.

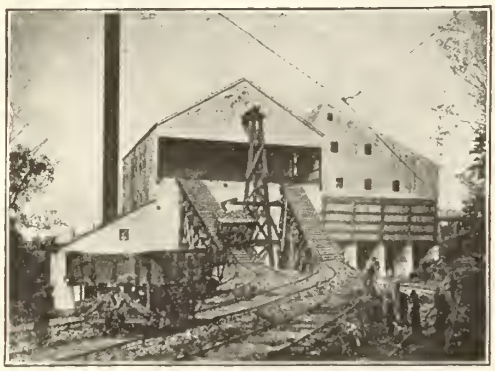
BUILT, EQUIPPED AND ERECTED BY

BRIDGE DEPARTMENT
CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

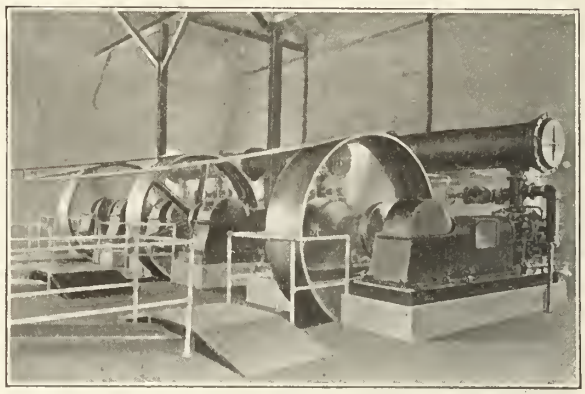
HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

CONTRACTOR'S PLANT

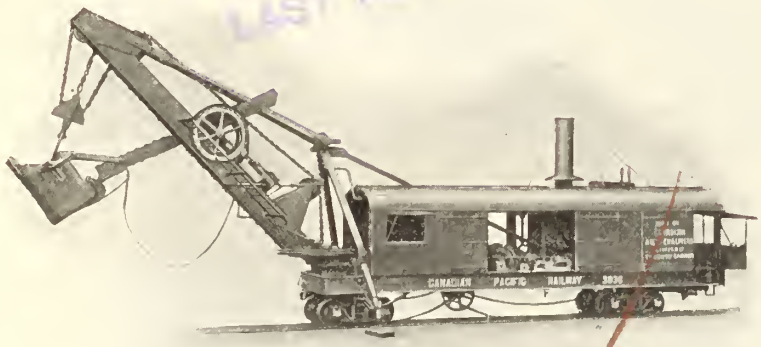


Rock Crushing Plants

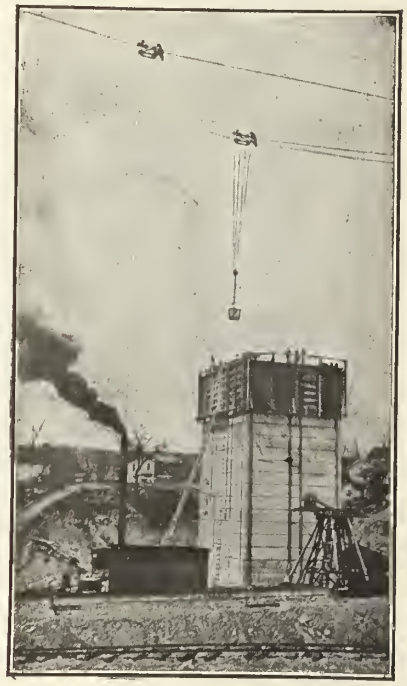
Crushers, Screens, Elevators, Feeders, Conveyors.



Air Compressors



Steam Shovels



Lidgerwood Cableways

CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

Why not make it Unanimous?

Below is a list of the electric railways in Canada using—

Electric Weld Rail Bonds

Calgary Municipal Railway, Calgary, Alta.
Dominion Power and Transmission Co., Hamilton, Ont.
Electric Railway Light and Telephone Commission, Port Arthur, Ont.
Montreal Tramways Co., Montreal, Que.
Niagara, St. Catharines & Toronto Railway Co., St. Catharines, Ont.
Ottawa Electric Railway Co., Ottawa, Ont.
Quebec Railway, Light, Heat and Power Co., Quebec, Que.
Toronto & York Radial Railway Co., Toronto, Ont.
Toronto Railway Co., Toronto, Ont.
Winnipeg Electric Railway Co., Winnipeg, Man.

Electric Weld Bonds do not corrode at the terminals and are made to fit any condition.

Write for our catalogue.

The Electric Railway Improvement Co.

2070 East 61st Street,
Cleveland, Ohio

Hunting in New Brunswick

Written by a
SPORTSMAN
for
SPORTSMEN
—telling how he

Filled His License

1 Moose
1 Caribou
2 Deer
and a
Bear

During a Three Weeks Hunting Trip in —— New Brunswick

Open Season SEPTEMBER 15th—NOVEMBER 30th.

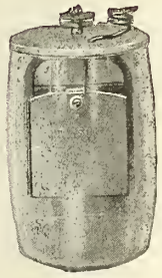
Write for free copy to

H. H. MELANSON, General Passenger Agent,
Canadian Government Railways,
Moncton, New Brunswick.

EDISON EBSCO PRIMARY BATTERY

FOR TRACK CIRCUITS

The Standard Closed Circuit Cell



EDISON
RSA Cell,
Type 404.

Why wait until winter to renew your track batteries, when the difficulties incident to winter renewal can be avoided by the use of Edison Primary Cells?

Winter renewing is expensive. Water is usually hard to get. Battery chutes must frequently be dug out of the ice and snow. The efficiency of the workman is lower and failures are apt to occur. Careful consideration fails to reveal any good reason for handling work of this nature when the ground is covered with snow, and the streams frozen, when it can be carried on so much more economically in mild weather.

Edison Primary Cells are now feeding the track circuits on many railroads. Three cells in multiple are generally used. This means a battery of 1,500 ampere hours capacity, with a life of from six to fourteen months, according to the current requirements of the circuit. Attendance is reduced to the minimum, and recharging is so arranged that no cells are handled during severe weather.

Booklet 2603 will be mailed on request. It should be read by every railroad man interested in the operation or care of track circuits. Send for it to-day.

EDISON
RSA Cell,
Type 401.

The Cheapest Form of Battery Energy

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

28 "Service" Branches Throughout Canada

CANADIAN CONSOLIDATED RUBBER CO., LIMITED
MONTREAL, P. Q.

"BUSINESS AS USUAL"

We have not, owing to the War, shut down any of our plants, discharged any of our workmen, reduced their hours of labor, or cut their rates of pay.

We are doing "BUSINESS AS USUAL."

We intend to continue this policy to the extent of our ability, and, to that end, suggest that you confine your purchases, during the war and thereafter, as largely as possible to goods "MADE IN CANADA."

When in the market for Rubber goods of any description—Belting, Hose, Packing, Tires or anything else—Write or wire our nearest Branch for prices and information.

It is our desire to serve you.

"BUSINESS AS USUAL"

CANADIAN CONSOLIDATED RUBBER CO., LIMITED
MONTREAL, P. Q.

28 "Service" Branches Throughout Canada

Galena-Signal Oil Company

Works

Franklin, Pa., and Toronto, Ont.

Canadian Sales Office—603 Shaughnessy Bldg., Montreal, Que.

Sole manufacturers of the celebrated GALENA COACH, ENGINE and CAR OILS, and SIBLEY'S PERFECTION VALVE and SIGNAL OILS.

GUARANTEE COST per thousand miles for from one to five years, when conditions warrant it.

Maintain EXPERT DEPARTMENT, which is an organization of skilled railway mechanics of wide and varied experience. Services of Experts furnished free of charge to patrons interested in the economical use of oils.

STREET RAILWAY LUBRICATION A SPECIALTY

KEEP STANDING

USE

Galena Railway Safety Oil

in Headlights, Marker and Classification Lamps, to secure Efficiency of Service, Maximum Candle Power, Clearness of Light.

Galena Long Time Burner Oil

for use in Switch and Semaphore Lamps, and all lamps for long time burning, to avoid smoked and cracked chimneys and crusted wicks.

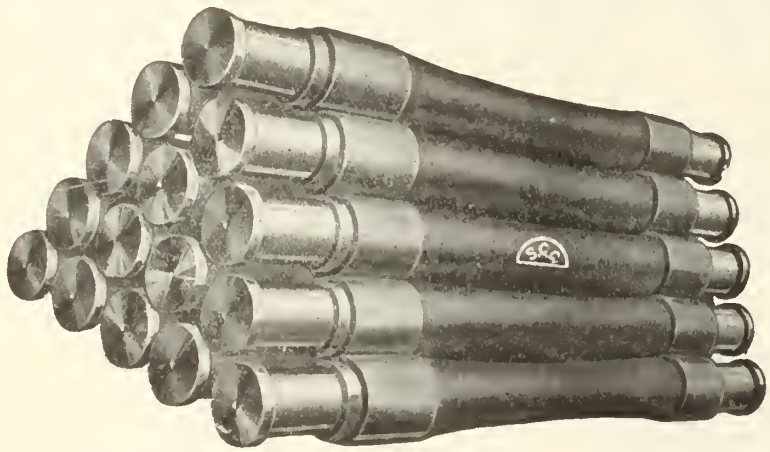
Tests and Correspondence Solicited.

S. A. MEGEATH,
PRESIDENT.

The Steel Company of Canada, Limited

HAMILTON, ONT.

Forged Steel Axles



We are prepared to furnish all kinds of forged steel axles for cars, freight, passenger and electric, and for locomotives, including drivers, engine trucks or tender trucks.

We Carry a good Stock of

Railway Track Equipment

including

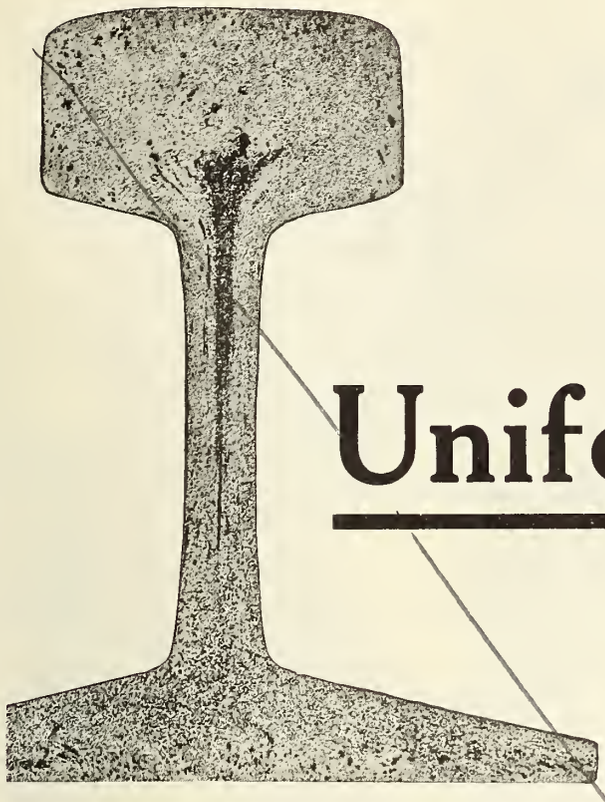
Track Bolts **Track Spikes** **Tie Plates** **Angle Bars**

Pole Line Hardware

Wire, Wire Nails, Staples, Screws, Rivets, Putty
"Tiger Brand" White Lead. "Invincible" Fencing.

Sales Offices:

HAMILTON MONTREAL TORONTO WINNIPEG
VICTORIA, B.C. VANCOUVER, B.C. ST. JOHN, N.B. HALIFAX, N.S.



Uniformity

STANDARD OPEN HEARTH A-RAIL.

Chemical Analysis.

	Ladle Test	Top of Head	Web	Flange
Carbon	0.75	0.67	1.03	0.73
Manganese	0.80	0.705	0.711	0.698
Phosphorus	0.021	0.023	0.045	0.025
Sulphur	0.044	0.026	0.068	0.032
Silicon	0.13	0.13	0.13	0.14

TITANIUM TREATED OPEN HEARTH A-RAIL—(0.10 TITANIUM).

Chemical Analysis.

	Ladle Test	Top of Head	Web	Flange
Carbon	0.62	0.58	0.65	0.61
Manganeso	0.79	0.679	0.705	0.692
Phosphorus	0.016	0.022	0.025	0.024
Sulphur	0.041	0.027	0.030	0.029
Silicon	0.05	0.10	0.10	0.10

The effect of TITANIUM-treatment on this most desirable feature is clearly shown in our Rail Reports—Bulletins Nos. 1 to 7, from which this data was taken.

Standard Open Hearth A-Rail

Physical Tests

	Head	Web	Flange
Impact Resistance	1.00	0.82	1.03
Hardness	219	253	215
Endurance	1065	540	1250

Titanium-treated Open Hearth A-Rail

Physical Tests

	Head	Web	Flange
Impact Resistance	2.10	1.55	2.63
Hardness	210	221	212
Endurance	1070	960	995

Titanium Alloy Manufacturing Company

Operating Under Rossi Patents.

TPC Reg. U. S. Pat. Off. TRADE MARK.

Process and Products Patented.

General Offices and Works: Niagara Falls, N.Y.

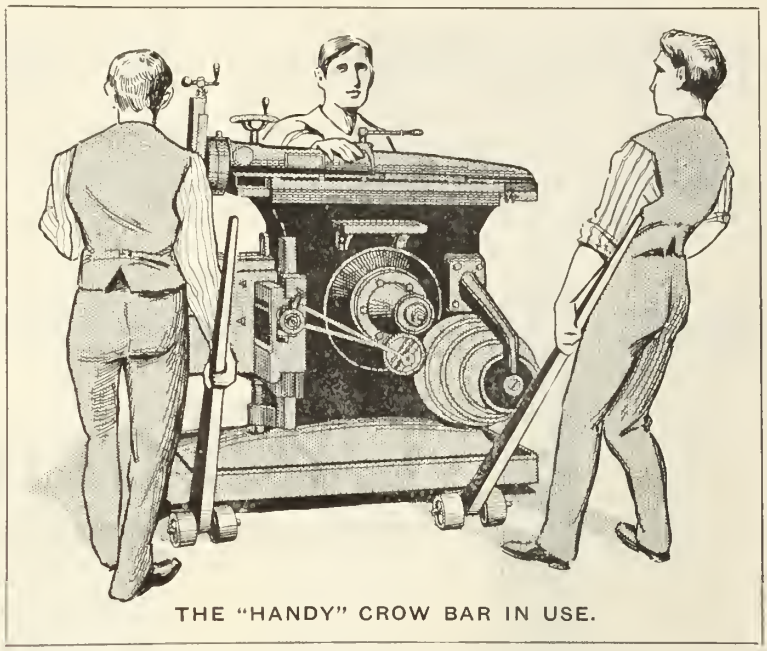
New York Office: 15 Wall St. Pittsburgh: Oliver Building Chicago: People's Gas Building

GREAT BRITAIN AND EUROPE: T. ROWLANDS & CO., Sheffield, England

FIGURE

The Saving You Will Effect By Installing

The "HANDY" MOVABLE CROW BAR

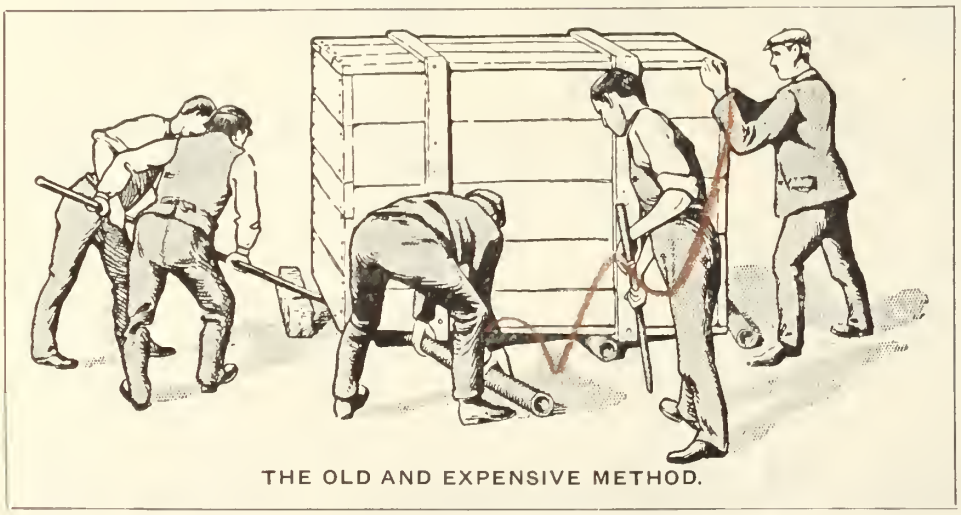


THE "HANDY" CROW BAR IN USE.

CHANGE

An ideal tool for shifting machinery in loading and erecting. It saves enormously in time and labor.

It prevents accidents and breakages, as the shifter cannot slip like the ordinary bar.



THE OLD AND EXPENSIVE METHOD.

It serves the double purpose—lifting and transporting.

One man can lift the maximum load.

Carried in stock.

MUSSENS LIMITED

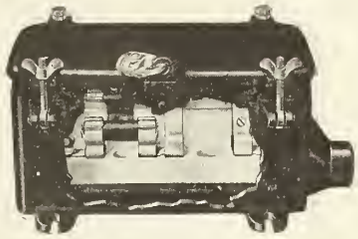
MONTREAL	TORONTO	COBALT	WINNIPEG
318 St. James St.	155 West Richmond St.	Opp. Right of Way Mine	259-261 Stanley St.
CALGARY	**VANCOUVER**	**QUEBEC**	**HALIFAX**
10th Ave. and 3rd St. East	101 Water St.	142 Peter St.	78 Granville St.

Types YKW and YKWC Condulets

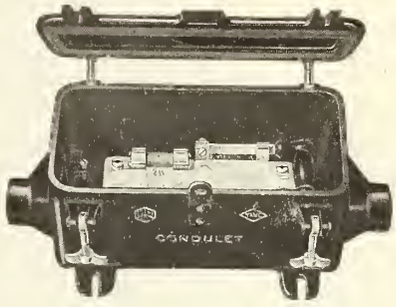
Water-Tight Housings for Knife Switches and Fuses

Made for 2 and 3-Pole Switches, and to Fit 1-2 to 3-Inch Conduit

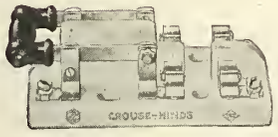
Type YKW Condulet.



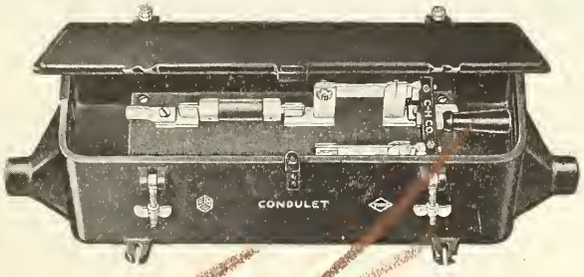
Type YKW Condulet with Door Locked.



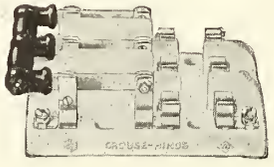
Type YKWC Condulet.



Two-pole Type YKK Switch.



Type YKWC Condulet.



Three-pole Type YKK Switch.

If your dealer does not stock them, write us.

Condulet Catalog No. 1000 Contains Complete Views, Information and Listings of These and All Condulets. Write for Copy.

Crouse-Hinds Company of Canada, Ltd.

Main Office and Works:

Toronto, Ontario, Canada

Kindly send me Catalog No. 1000.

Name .....

Street .....

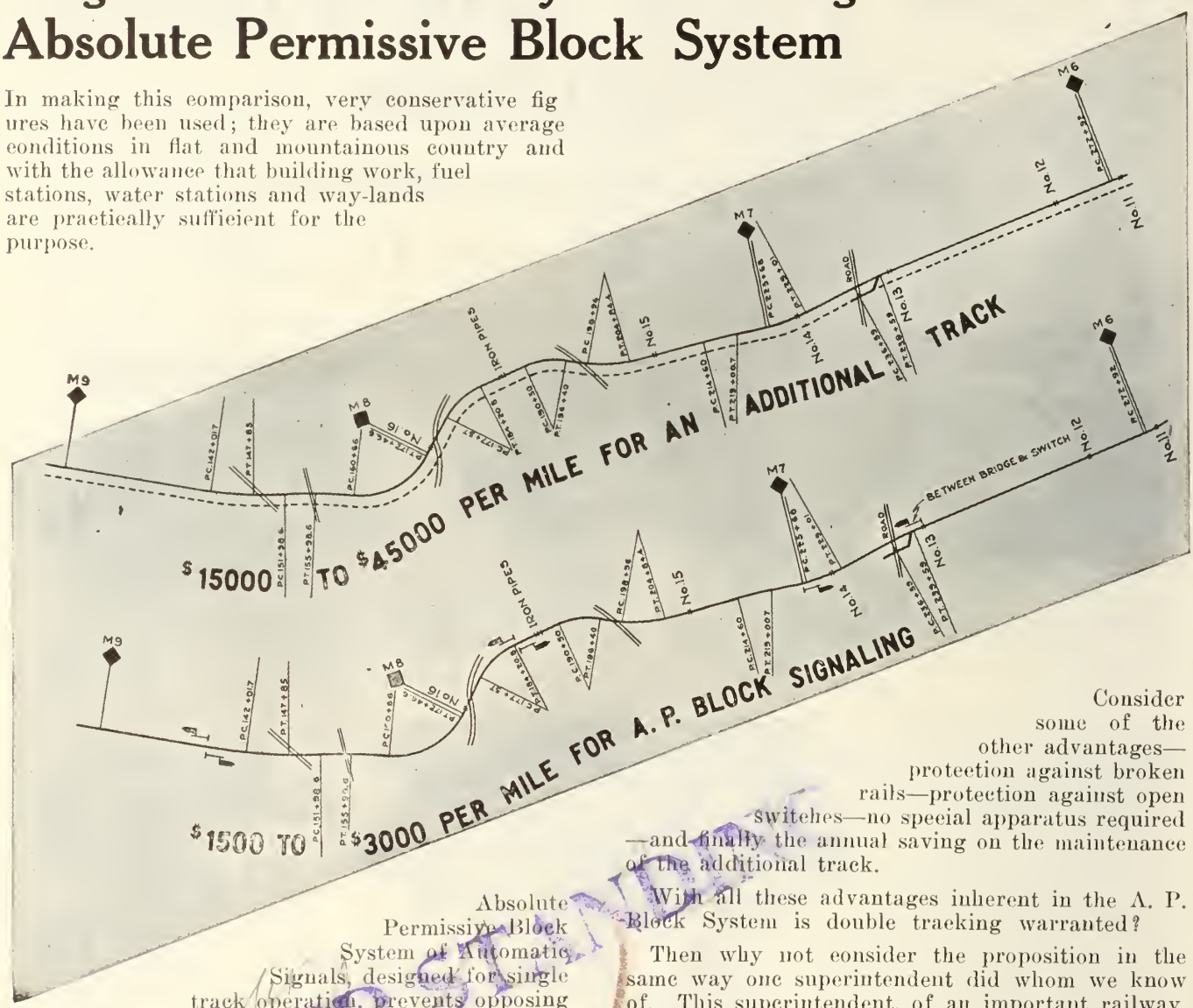
City .....

Prov. .....

C.R.M.W. 1114

Save 9/10 the cost of double-tracking your single-track line by installing the Absolute Permissive Block System

In making this comparison, very conservative figures have been used; they are based upon average conditions in flat and mountainous country and with the allowance that building work, fuel stations, water stations and way-lands are practically sufficient for the purpose.



Absolute Permissive Block System of Automatic Signals, designed for single track operation, prevents opposing trains from entering the same piece of single track between sidings but permitting trains, moving in a like direction, to as closely follow each other at speed and with entire safety as though they were on one track of a double track line.

This facilitation of traffic which the A. P. B. System gives, approaches the results from double track operation and is secured at about 1-10 the cost of an additional track.

Consider some of the other advantages—protection against broken rails—protection against open switches—no special apparatus required—and finally the annual saving on the maintenance of the additional track.

With all these advantages inherent in the A. P. Block System is double tracking warranted?

Then why not consider the proposition in the same way one superintendent did whom we know of. This superintendent, of an important railway, recommended to his management an appropriation of a large sum of money for a second track. After careful investigation it was found that the expense of the second track could be avoided by an installation of our A. P. Block System; this authority was granted, the system has been installed and it has postponed double tracking that particular line for many years to come.

You can make the same postponement.

"Safety First"

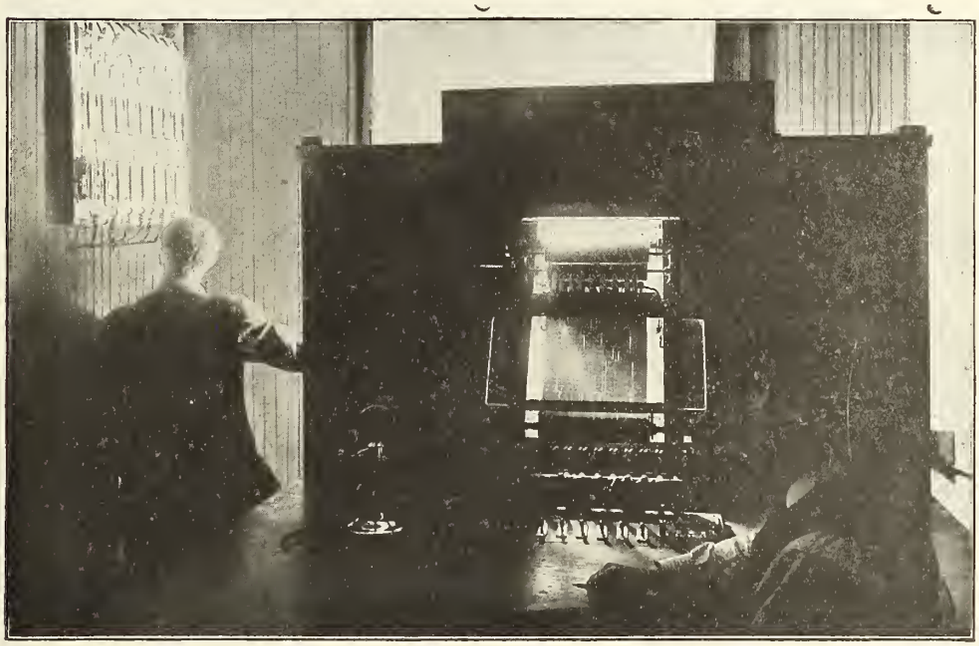
GENERAL RAILWAY SIGNAL COMPANY

OF CANADA LIMITED

Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba

What Do You Really *Know* About The Simmen System of Signaling



Did you ever talk about it to any responsible official of any of the high-speed interurban roads using the Simmen System?

Did you ever ride on a car protected by this System? And see the cab signal constantly staring the motorman in the face—see it change from green to red and back to green again?

Have you ever sat at a Simmen Dispatcher's Table and watched the automatic recording of the movements of every train? Seen the dispatcher stop a train at a given point by simply pushing a lever?

Have you ever examined the interlocking feature on the dispatcher's levers which prevents him from giving clear signals to opposing trains?

Have you ever had definite authoritative figures on the cost of installation and operation of the Simmen System?

How can you judge of the value of the Simmen System without thoroughly investigating its workings and cost?

You can make such an investigation easily and conveniently. Do it.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

To Parties Manufacturing, or Intending to Manufacture in Canada:

We are prepared to produce, upon a large scale, articles of metal and wood.

Our facilities are those necessary for the extensive and economical manufacture of the heaviest freight cars and the highest class of passenger cars. These facilities include plants for the manufacture of steel, malleable and grey iron castings—rolled steel and iron products—frogs, switches and track work for electric and steam railways—coil and elliptic springs—forgings—cabinet and other wood work—and all preparatory and finishing adjuncts.

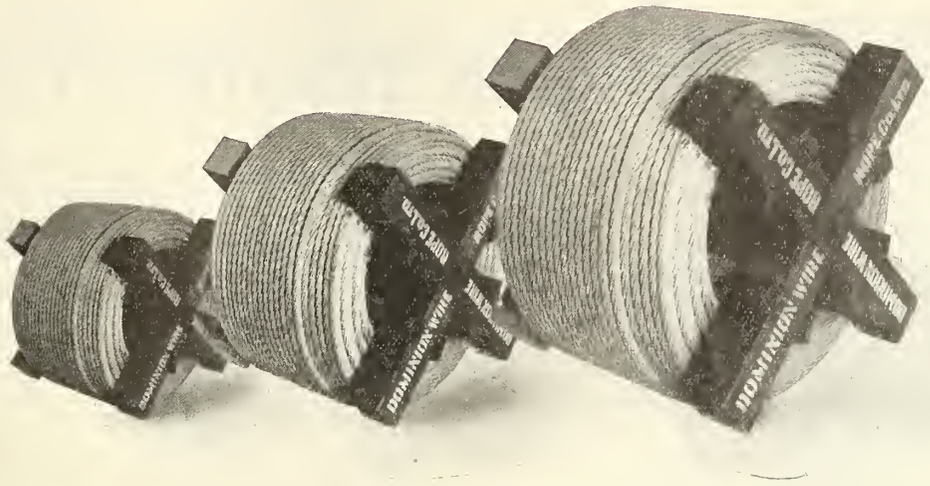
The various plants are distributed from Amherst, N.S. to Fort William, Ont.

Correspondence invited.

Please address Sales Department,
P. O. Box 180,
Montreal.

Canadian Car & Foundry Company, Limited
Canadian Steel Foundries, Limited
Pratt & Letchworth Company, Limited
Rhodes, Curry Company, Limited

WIRE ROPE



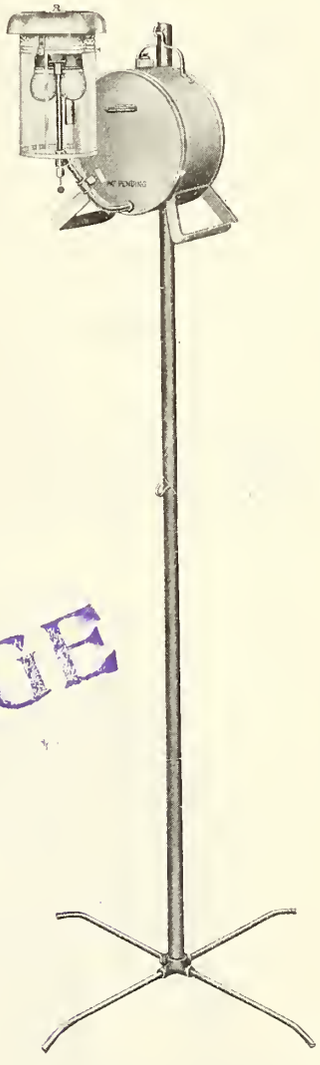
WIRE ROPE

MANUFACTURED BY

THE DOMINION WIRE ROPE CO., LTD., MONTREAL

The "KING BEE" Gasoline Light

800 Candle Power



Requires no wiring—saves all expense—
Gives the same illumination as the strongest arc lamp at one tenth the cost.

Does not flicker—
Can be picked up and carried forward with the work—

Gets better service out of your workmen—
Costs less to operate and pays for itself in one month—

Rainproof and windproof—
No Glassware to be continually breaking—

Simple to operate—
Nothing to get out of order—

Well built and inexpensive—

COSTS FIVE CENTS TO OPERATE TEN HOURS.

We have placed a large number of these "King Bee" Lights with Contractors—Mining and Quarry Companies—Railroads, Etc. and they are giving universal satisfaction.

The "King Bee" is the ideal light for general construction work, steam shovels, Dredges, etc.

We supply CONTRACTORS' EQUIPMENT of all descriptions.

BRANCHES
ST. CATHARINES, ONT.
WINNIPEG, MAN.
VANCOUVER, B.C.

F·H·Hopkins & Co

HEAD OFFICE
MONTREAL

Pintsch Mantle Light

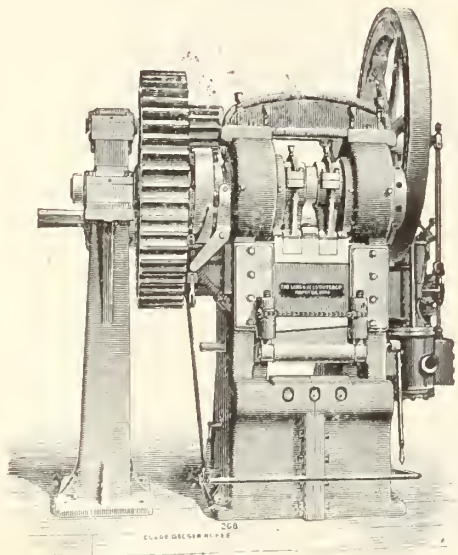
No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

2 RECTOR STREET, NEW YORK

718 TRANSPORTATION BUILDING, MONTREAL

POWER PUNCHING AND SHEARING MACHINERY



Gate Shear—Steam-Driven

Over 350 sizes and styles for all kinds of light and heavy work designed and manufactured by

THE LONG & ALLSTATTER CO.

Hamilton, Ohio, U. S. A.

Riveting Machines — Tire Welding Machines

Armature Disc Notching Machines

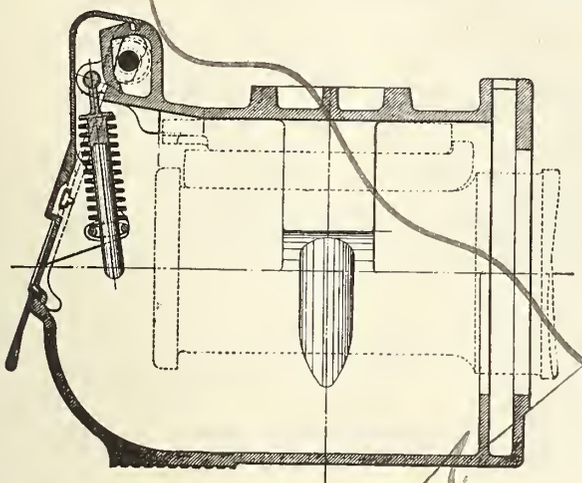
Tire Bending Rolls — Beam Coping Machines

Bending and Forming Machines

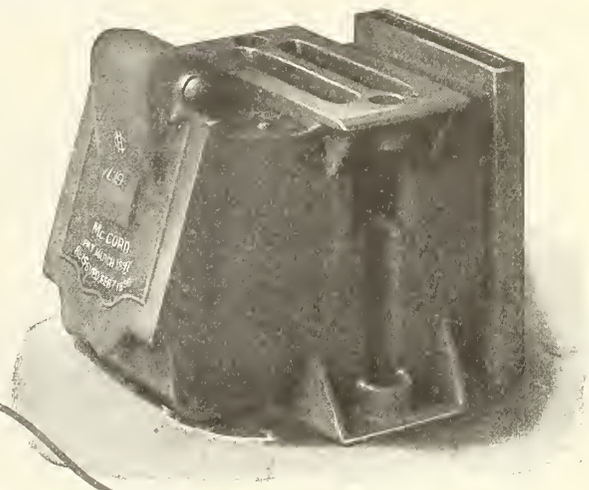
Write for Catalogue if interested. Correspondence invited.

The McCord Malleable Iron Journal Box

MANUFACTURED IN CANADA



The Strongest, Lightest, Tightest Box Made



The McCORD Draft Gear
The McCORD Spring Dampener

The McKIM Gasket
The McCORD Force Feed Lubricator

McCORD & COMPANY
People's Gas Building, Chicago

THE HOLDEN CO., Limited
354 St. James Street, Montréal

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LIMITED

MANUFACTURERS OF

POSTAL CARS, BAGGAGE CARS, TRAM CARS, MINING CARS, DUMP CARS

STEEL UNDERFRAME CARS AND WOOD FREIGHT CARS

ALSO MAKERS OF

CHILLED IRON CAR WHEELS

HALIFAX - - - NOVA SCOTIA

STEEL SHIPBUILDERS

Engineers and Boilermakers

Steel Tug "Fredericton" built for the Dominion Government, 80 feet length, 20 feet breadth, 10 feet draught, compound marine engine 12 x 26 x 18, clyde boiler 10 feet x 11 feet, 145 lbs. steam.

Dredges, Hydraulic and Dipper Type; Steel Steamers, full Canal Size; Tugs, Barges and Scows

Marine Engines and Boilers, all Sizes

Polson Iron Works, Limited

Works and Office, Esplanade East, Toronto

CANADIAN PACIFIC

WINTER TOURS

To the Land of Sunshine and Summer Days

CALIFORNIA, FLORIDA, LOUISIANA, Etc.

Limited trains leave Toronto daily, making direct connection at Detroit and Buffalo for the Southern States, and at Chicago for California, etc.

Those contemplating a trip of any nature should consult Canadian Pacific Ticket Agent, who will be pleased to quote rates, arrange reservations and attend to all details in connection with your trip; or write

M. G. MURPHY **District Passenger Agent** **TORONTO**

NICHOLSON MADE

The File That Made "The Flyer" A Fact

Without a file to smooth the rough edges, the "mogul" and the "greyhound" would be mere dreams.

The file has made the "flyer" a fact.

And a tour of the shops will convince you that the file was a

NICHOLSON-MADE FILE

Not only the greatest railway shops and shipyards in Canada and the United States—but even the Government railroads of far-off India—are among the largest individual consumers of NICHOLSON-MADE-FILES.

And in the interest of economy and efficiency, they are learning to use **two files where they heretofore only used one.**

The many advantages of the "use more files" plan is best displayed by a test in your shops. It will pay well to try it to-day with Nicholson-Made-Files.

Brands:

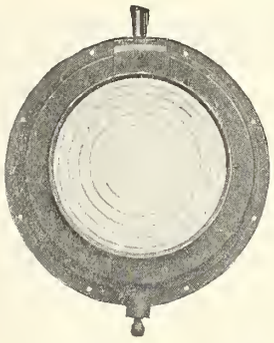
Kearney & Foot Great Western
American Arcade Globe

At Your Dealer or Supply House

NICHOLSON FILE CO., PORT HOPE, ONT.

"FILE FILOSOPHY"—A 50 years' education on files in an hour, and our Catalog sent FREE on request.

CHANGE



KILL LAST AD!

Two Piece Pressed Steel Dash Headlight

More durable than cast iron—neater in appearance. Only two parts, the door and the one piece reflector and back case.

Reflector coated with white porcelain enamel is very serviceable and easy to clean. Furnished with semaphore or plain glass white lens or red, the latter being for use as a rear end marker.

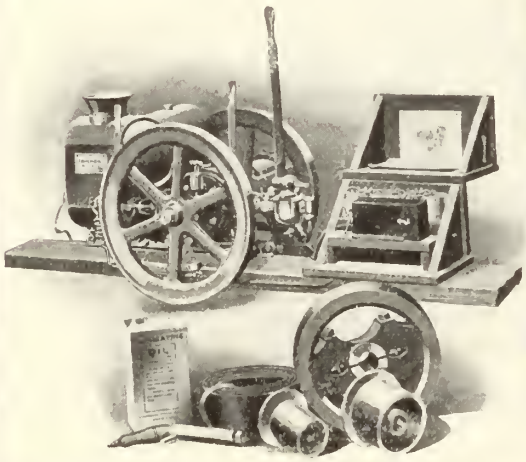
Write for Descriptive Booklet Today.

THE TROLLEY SUPPLY CO. - Canton, Ohio

Also Manufacturers of Retrievers, Catchers, Bases, Valves, etc.

THE
FAIRMONT
MOTOR CAR OUTFIT

Can be easily installed on any old Hand Car and turns it into a light weight powerful motor car which runs as well in winter as summer.



Fairmont Motor Cars Moving a Tool House.

These motor cars are hand cars fitted with the FAIRMONT OUTFIT. They made 8 miles an hour with this load. When one Foreman gets a FAIRMONT his neighbor Foremen soon do likewise.

Write for our Easy Payment Plan.

FAIRMONT MACHINE CO., Dept. W., Fairmont, Minn., U.S.A.

DEARBORN WATER TREATMENT METHODS COMPRISE

Knowledge of the Water Conditions
Application of the CORRECT REAGENTS

Careful Supervision as to Quantity and Regularity of Treatment

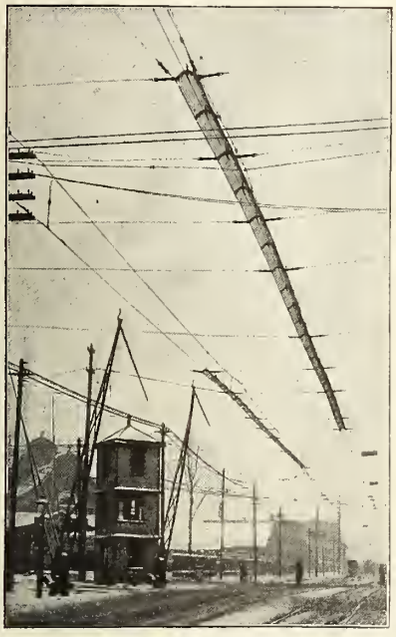
Such thorough, scientific handling of bad water propositions alone insures constant and uniform results in the prevention of scale, corrosion, pitting and foaming.

The manner of applying Dearborn Treatment is simple, and calls for no outlay of capital for equipment. We require gallon samples of the waters for analysis. After completing the analyses we are ready to prepare treatment and will send an expert engineer to instruct in the proper handling of the material.

Dearborn Chemical Company of Canada, Limited

Office and Factory,
1220-1230 Dundas Street, TORONTO, ONT.

National Railroad Trolley Guard



Gives reliable grade crossing protection despite winter's storms.

The open wire mesh trough is always in position to catch trolley wheel if it leaves wire and furnish power to carry car across steam tracks.

Offers little resistance to wind; cannot collect snow or ice to any extent.

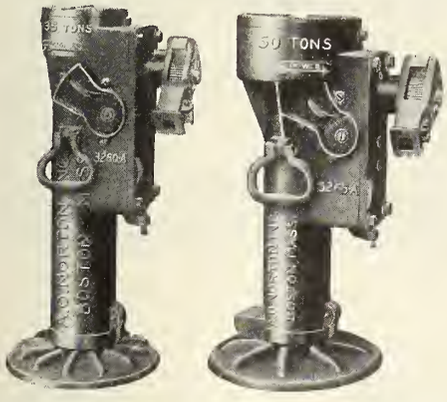
Easily installed and requires little maintenance.

See pages 210-216 of Catalog No. 14 for details.

CHANGED

THE OHIO BRASS COMPANY, Mansfield, Ohio, U.S.A.

NORTON SELF LOWERING JACKS ARE THE FASTEST JACKS MADE



No matter what ANYONE says.
You can prove it by trying them beside any other make.

When load is raised, *your work is done.*

You do not have to crank or pump the load down as with other Jacks. Just "press the button" and the Jack lowers its full load with *absolute safety.*

Send for complete Catalogue and Discount. 35 and 50 Tons Capacity. Plain and foot lift.

Made in Canada by

A. O. NORTON, LTD., COATICOOK, QUE.

Stock Carried by Canadian Agents, MUSSENS LIMITED

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MODERN HIGH-CLASS

ROLLING STOCK

Passenger, Freight and Electric Railway, Car Castings, Forgings and Repair Parts.

CROSSEN CAR COMPANY, LTD.

COBOURG - ONTARIO

GRAND TRUNK RAILWAY SYSTEM

Algonquin Provincial (Ontario) Park, Canada.

A Thoroughly Universal Vacation Territory, Reached only by the

Grand Trunk Railway System

IDEAL CANOE TRIPS—A PARADISE FOR CAMPERS.

Nominigan Camp, Smoke Lake.

285 miles west of Montreal.
200 miles north of Toronto.
170 miles west of Ottawa.
2,000 feet above sea level.

The park covers an area of 2,500,000 acres. Over 1,500 lakes and rivers in its boundaries. Finest fishing in the "Highlands of Ontario." Speckled Trout, Salmon Trout, and small-mouth Black Bass.

THE HIGHLAND INN.

Furnishes splendid hotel accommodation. Rates $2.50 to $3.00 per day; $16.00 to $18.00 per week.

In addition, Camps "Nominigan" and "Minnesing" offer novel and comfortable accommodation at moderate rates.

Write for full particulars, illustrated description matter, etc., to J. Quinlan, Bonaventure Station, Montreal, or C. E. Horning, Union Station, Toronto.

G. T. BELL, Passenger Traffic Manager, Montreal, Que. H G. ELLIOTT, General Passenger Agent, Montreal, Que.

Nova Scotia Steel and Coal Co., Limited

Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALIFORIC VALUE--LOW ASH--UNEXCELLED FOR STEAM-RAISING PURPOSES.
BEST HOUSE COAL MINED IN CANADA.

Collieries, Iron and Steel Furnaces: SYDNEY MINES, C. B.

Coal Shipping Piers: NORTH SYDNEY, C. B.

Finishing Mills, Forge, and Engineering Shops: NEW GLASGOW, N.S.

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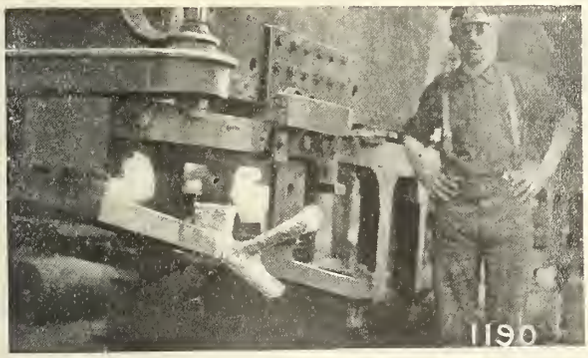
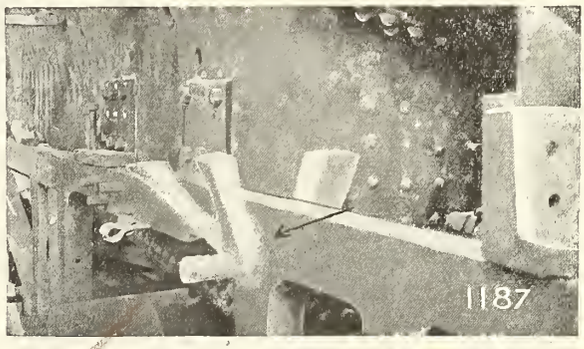
NEW GLASGOW, N.S.

Difficult Frame Welding Made Easy with Thermit



Finished Thermit Weld on Engine No. 802 of the Grand Trunk Pacific, Transcona, Man.



Frame Welded with Thermit by the Illinois Central, Centralia, Ill.

You can weld a frame quickly and economically with Thermit, whether it is broken in the splice, under the fire box, close up to the cylinder, or at any other point. It is not necessary to take the frame down, as all welds can be made with the frame in place.

No other process of welding is so quick and uniformly efficient and economical in operation as the Thermit Process.

The proof is in the fact that to-day 435 railroad shops in North America are using Thermit and returning their engines to service in from 10 to 24 hours.

We have just issued a new pamphlet of instructions for the use of Thermit in railroad shops, known as Pamphlet No. 2144. This should be in the hands of every railroad man, as it tells how and why the Thermit Process of welding will save thousands of dollars every year in repair costs. Write for it to-day.

GOLDSCHMIDT THERMIT COMPANY

WILLIAM C. CUNTZ, Gen. Mgr.

103 Richmond St. W., Toronto, Ont.
90 West Street, New York

329-333 Folsom Street, San Francisco
7300 South Chicago Avenue, Chicago

Rail Hotels
Steamships

CANADIAN NORTHERN

Express
Telegraph

Over 7,400 Miles in Operation.

Traverses the Most Fertile Sections of Western Canada.

Thousands of Free Homesteads in the Best Sections Open for Settlement on Its Lines.

Reaches All the Principal Commercial and Industrial Centres.

Gives Access to the Best Sporting and Tourist Country in Six Provinces.

For Rail and Steamship Tickets, Parlor and Sleeping Car Reservations, Literature and All Information, Apply to Nearest Agent, or the General Passenger Departments.

Halifax, N.S.
Montreal, Que.

Canada's Second Transcontinental

Toronto, Ont.
Winnipeg, Man.

NOW it is the HALL ELECTRIC INTERLOCKING

Because that apparatus offers safety features that are found in no other. Alternating current control of return indications is safer than using the same kind of current for operating functions. Double protection is secured by using a higher voltage for the return than is used for the operating.

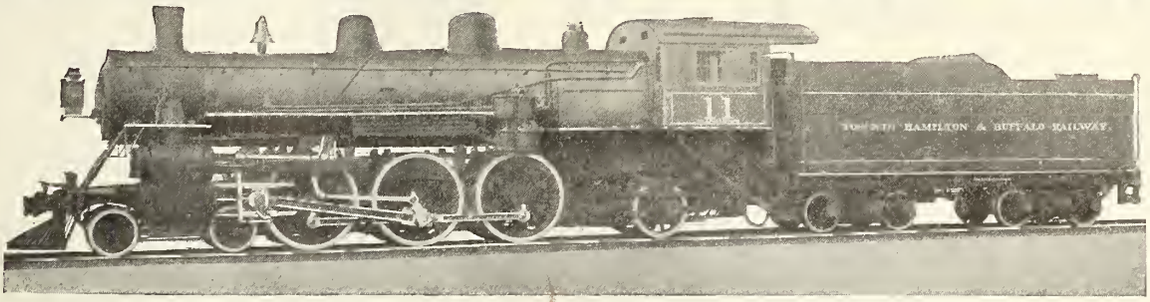
It is of unit construction. Levers may be removed or added without interference with the others.

HALL SWITCH AND SIGNAL CO.

50 Church St., New York

Montreal Works : **Garwood, N. J.** **Chicago**

Pacific Type Locomotives



Total Weight of Engine, 219,800 pounds; Weight on Drivers, 136,800 pounds; Diameter of Drivers, 69 inches; Boiler Pressure, 180 pounds; Cylinders, 23 x 28 inches; Maximum Tractive Power, 32,800 pounds.

Pacific type locomotives of improved design, equipped with fuel saving devices, are hauling heavier trains at increased speeds, with less coal per trip, than locomotives of the same type but of older design.

Performance of locomotives on the Toronto, Hamilton and Buffalo. Figures furnished by the railroad.

	New Pacifics.	Old Pacifics.	Per Cent. Gain.
Average Train Loads, tons behind tender	645	555	16.2
Average Speed, M.P.H.	60	52	15.4
Average Coal per trip, tons	3⅝	6	39.6
Average Water per trip, gallons	8,500	12,500	32.0

MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

THIS ONLY SERVES TO ILLUSTRATE

Type of Logging Car Built for St Lawrence Pulp & Lumber Co.

Another Type of Car with a "National" Reputation

Logging Cars
Dump Cars
Contractor's Cars
Mine Cars
Street Cars
Interurban Cars
Wood or Steel Passenger Cars
Wood or Steel Freight Cars
Steel Underframes
"Damascus" Brake Beams
Suburban Cars

Proper Equipment and Organization for Handling all Classes of Cars

National Steel Car Company, Limited

"Watch for the Car with the 'National' Reputation"

Montreal Office
Shaughnessy Building

Western Union Code
ADDRESS INQUIRIES TO HAMILTON

Works and Operating Offices
Hamilton, Canada

The Sign of the Times

Enamelled iron signs are ideal for station name and station door signs.

They are much superior to a painted wooden sign, which has to be repainted at frequent intervals, and they last a lifetime.

There is absolutely no wear to them, and we guarantee that they will not fade or be affected by the weather in any way.

We will be pleased to quote you prices on request.

Acton Burrows Limited

70 Bond Street, Toronto, Ont.

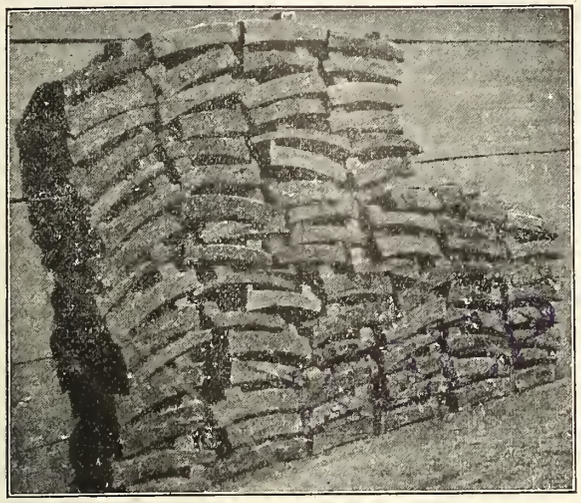
Consolidated Type Locomotive Built for Freight Service on the Grand Trunk Pacific Railway.

LOCOMOTIVES

Long experience, new equipment, efficient management and expert workmen, are guarantees that our Locomotives will give record service. **Over 1,200 Locomotives have been built at our Works since the erection of the plant.** We are builders of Simple and Compound Locomotives adapted to every variety of service, for Railway Contractors, for Industrial Purposes, Mines, all classes of Railway Work, etc.

We are also builders of stationary boilers, suitable for contractors and industrial plants. Grey iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract. We also make drop forgings of all descriptions.

CANADIAN LOCOMOTIVE CO., Limited, Kingston, Ontario



Money paid for these Brake Shoes was largely money wasted

Why?

Because these unreinforced brake shoes did not give equivalent service for their cost, having broken in service before their life had barely commenced.

And the remedy?

Use only Steel Back Brake Shoes—then you will get your brake shoe money's worth in long and safe service.

Manufactured in Canada.

AMERICAN BRAKE SHOE & FOUNDRY CO.

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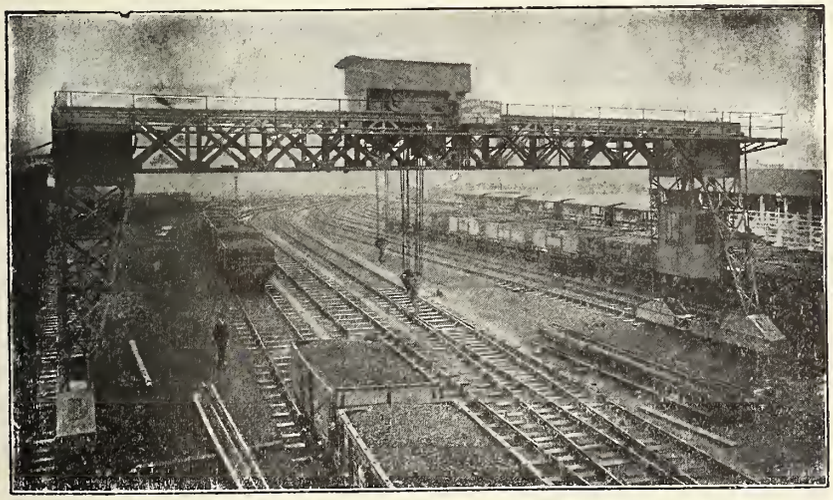

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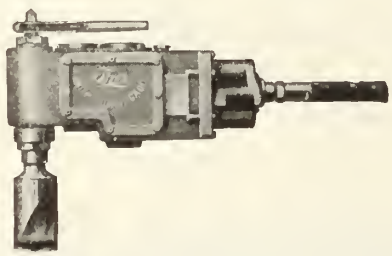

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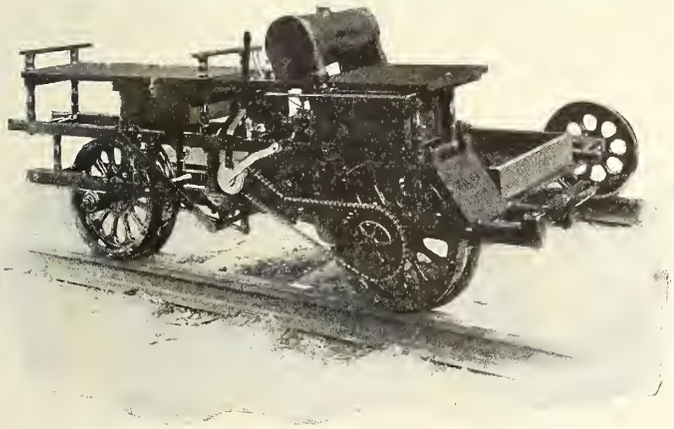

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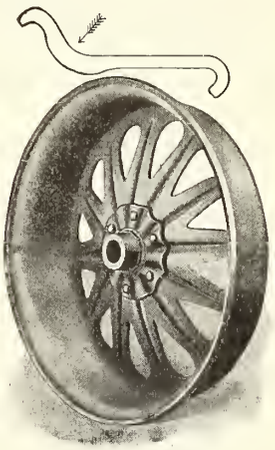

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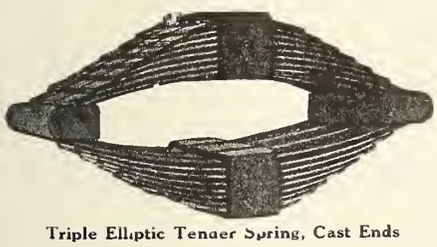

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Canadian Railway and Marine World

November, 1914.

Canadian Pacific Railway Locomotive Shops at North Bay.

The great increase in traffic on the Lake Superior division, C.P.R., so far outstripped the facilities for handling the equipment, that it became necessary to consider the enlargement of the divisional shops at North Bay, Ont. Work was commenced early in 1913, requiring about a year to complete. The project included, not only the extension of the shops, but also the mechanical yards, involving the reclamation of a small section of land along the shore of Lake Nipissing. The general layout of the extensions made is shown in the accompanying plan of the shops and mechanical yards. A complete description of the general scheme appeared in Canadian Railway and Marine World, Dec., 1913.

The motive power accommodation prior to this change consisted of a 23 stall locomotive house, with small machine and blacksmith shops attached to the west end, as shown in the accompanying yard plan. This combined building was of a heavy masonry construction, and has been retained in the new layout. To the west of this building, and adjoined thereto, there has been added a combined machine and erecting shop, served by a transfer table along the west frontage of the shop. The erecting shop is 70 by 208 ft., and 43 ft. high, of steel frame construction, resting on concrete foundations. The shop width is spanned by 70 ft. steel trusses, resting on 12 in. 40 lb. I beam columns at 20 ft. centres. It is served by a 5-ton travelling crane operating the full length of the shop, on runways composed of 15 in. I beams, with 56 lb. rails on top. The roof is of mill construction, with 8 by 14 in. purlins, at 8 ft. centres, carrying a 3 in. plank roof, surfaced with tar and gravel. The erecting shop bay contains 10 tracks, each with a convex bottom, concrete locomotive pit 4 ft. wide and 3 ft. deep, and one pit provided with an electrically operated lift for jacking up locomotives for wheeling. Over the main walls of each locomotive pit, the flooring is of heavy 6 in. planking, about 3 ft. wide, to provide a solid jacking surface under the sides of the locomotives. The balance of the erecting shop floor is laid with 3 in. planking on cedar sills on a 12 in. cinder base. The locomotive doors along the west side are 12 ft. 7 ins. by 17 ft., formed top and sides of 12 in. 20½ lb. channels.

The machine shop, to the east or rear of the erecting shop, is of the same length, but 80 ft. wide and 23 ft. high, of a similar construction to the erecting shop, except that narrower bays are used, with steel I beams on steel columns at 26 ft. centres, forming three bays the length of the shop, with a similarly constructed wing along the face of the old machine shop. The floor is of 3 in. planking on cedar sills.

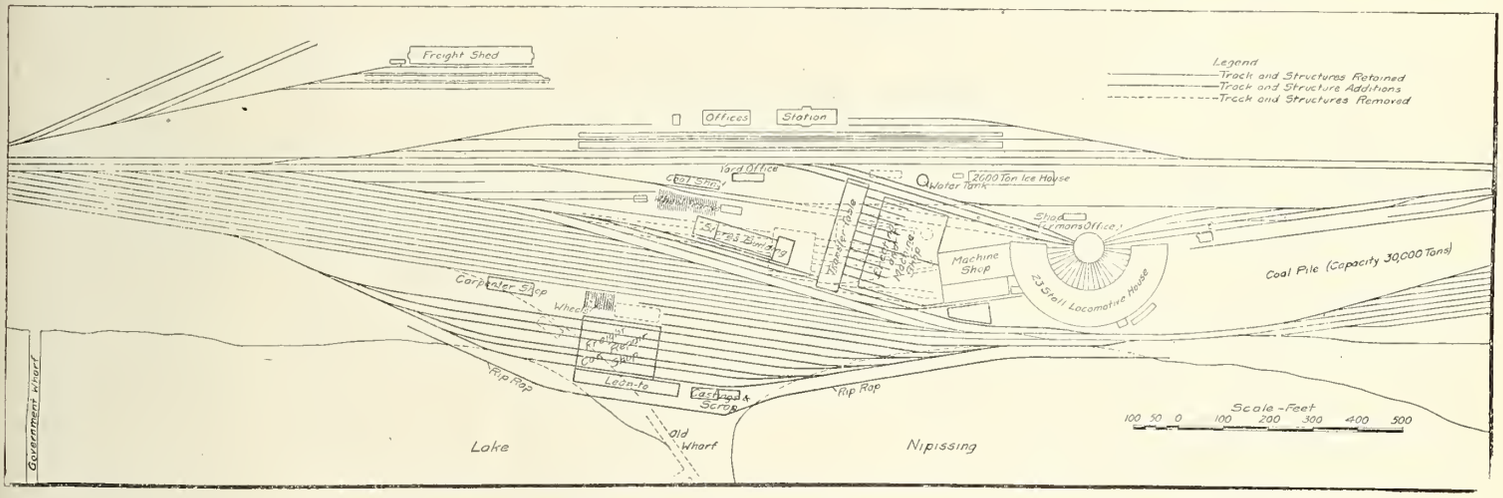
The track running from one of the locomotive shop stalls through into the old machine shop, is extended through the new machine shop and erecting shop as one of the central pit tracks, through which work can be handled back and forth between the shops and the locomotive house. Another track extends longitudinally through the central machine shop bay, connecting through a turntable with the locomotive house track, and at either end with outside tracks along the north and south sides of the building, through similar turntables. The two northerly erecting shop pit tracks are extended through to this longitudinal track, forming track space for handling the tender and truck repairs.

There is a 50 ft. transfer table along the full length of the west side of the building, taking in each of the outside end service tracks. Between the transfer table and the building, there is a 40 ft. space for locomotives awaiting entrance to the shop, and across the transfer table there is a similar storage space, abutting against an earthen wall, the shop level being slightly below that of the surrounding ground level. Shop entrance is thus through the two end service tracks, locomotives entering from either side of the yard through either of the run around tracks. A track paralleling the southerly run around track passes by the stores building, facilitating the handling of stores to the shops, over the transfer table. The transfer table runs on 4 tracks. The side walls of the transfer table pit are composed of 8 in. square timbers resting on sills, and the end walls of 2 in. planking and round cedar posts.

The locomotive shop is situated directly across from the southeast corner of the station building, a crossing over the station tracks leading directly to the locomotive shop transfer table, a concrete retaining wall at the north end of the transfer table providing for the change in elevation between the shop tracks and those on the main line, the latter some 3 or 4 ft. above the shop level.

The foreman's office, in the northeast corner of the shop near the main entrance door, is light and roomy, 20 by 25 ft., glassed in on the two shop sides, and is amply large enough for the general foreman and his complete staff. In addition to the usual desks and filing cabinets, there is a locomotive shopping schedule, somewhat similar to that in use at the company's Angus shop, but simpler to meet the more limited requirements of a small shop. It has only been introduced recently, but has been found very satisfactory in properly routing the locomotives through the shop, and scheduling each part of the work depending on the nature of the repairs, so that they should be completed by a given date. The time of shopping is thus closely checked.

The erecting shop occupies the whole of the westerly bay, and contains 10 tracks as mentioned, the depth of the erecting shop being 70 ft. Each track in the erecting shop contains a locomotive pit, 50 ft. long, with the northerly pit equipped with an electric wheeling jack. A special feature is the whitewashing of the pits,—bottom, sides and ends—once a week. They are built of concrete, and in consequence of the whitewash will take a good finish. The advantage in the white finish is twofold; not only does it facilitate the handling of repairs in the pit, by giving the workmen better lighting conditions, but it also enables the foreman to see at a glance just what work is progressing in the pit, and to note that the men are not "soldiering" on the job. It is remarkable what a difference in the pit lighting this simple expedient



Plan of Shops and Mechanical Yards, Canadian Pacific Railway, North Bay, Ont.

makes, as it is possible to see every operation in the pit from any position in the shop, provided the view is unobstructed.

The machine tool layout has been planned with a view to ease in handling the parts from the erecting shop to the tools, and as a further analysis will show this idea has been well carried out, as all the departments where the members to be machined are heavy, are either near the erecting shop, or are adjacent to one of the shop tracks.

Back of the wheeling jack, is situated the general department, containing all the heavier tools. They consist of the following:

42 in. passenger car wheel lathe.
36 by 26 in. by 10 ft. planer.
80 in. driving wheel lathe.
51 in. boring mill.
10 ton driving wheel press.

These four tools are each separately motor driven. The planer and boring mill are served by a 15 ft. 1 ton jib crane, swinging over the central shop track, over which the work is forwarded to the machines. The passenger car wheel lathe, from the nature of its work, does not require a crane to the same degree, as its work can be rolled into the lathe. The space between it and the south wall is a small storage department for these wheels. The driving wheel lathe is directly opposite one of the erecting shop tracks, the track from which extends through to the lathe, over which the wheels are led into the lathe. From the wheeling jack in the end pit, the wheels are carried down the shop by the travelling crane to the lathe track. The driving wheel press is similarly situated to the driving wheel lathe, to the south of the locomotive house track, with the erecting shop track leading through to it. It is served the same as the driving wheel lathe.

The axle box and piston department is immediately to the north of the locomotive house track, and contains the following equipment:

5 ft. radial drill.
16 in. slotter.
Axle box press.
Piston clamp.

This department also contains 3 work benches. It is located conveniently to the track from the erecting shop. Immediately to the north of this department is a battery of smaller tools for general work, consisting of the following:

36 in. gap lathe.
Two 36 in. drills.
30 in. drill.
25 in. drill.
Nut tapper.
4 in. pipe threader.
2 spindle screw machine.
Double emery wheel.

These tools are driven in a group, together with the last department, from a 20 h. p. motor. The motion department is directly south of the office, containing the following equipment:

Two 24 in. lathes.
Two 20 in. lathes.
18 in. lathe.
Centring machine.
Double emery wheel.
Marking off table.

This work, being of a lighter nature than that on the other side of the shop, has not the handling facilities. Immediately adjoining this department to the south, is the side rod department, containing the following tools:

Two 24 in. shapers.
36 in. drill.
Bushing press.

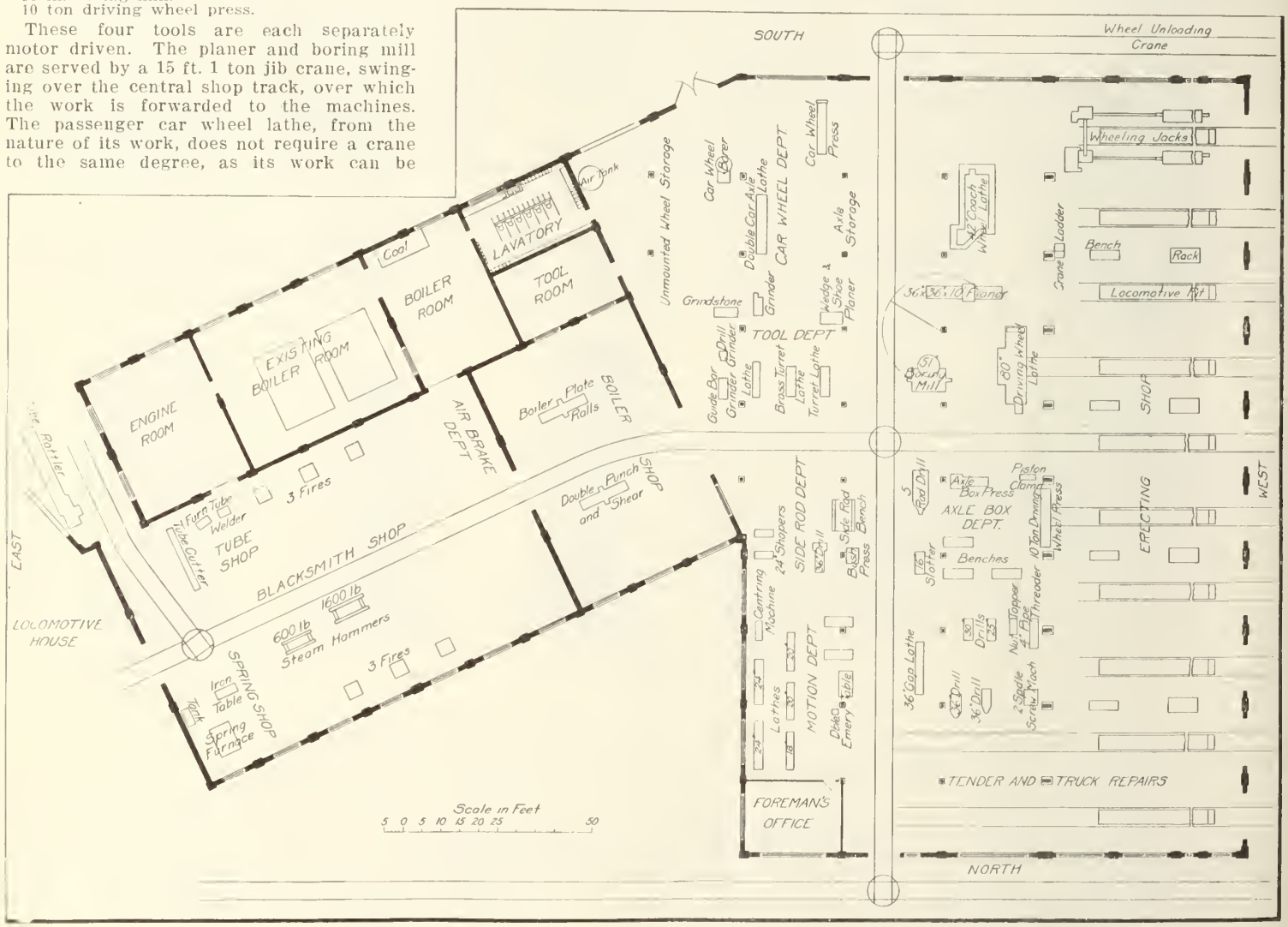
There is in addition, a side rod bench. This department, in conjunction with the motion department, is operated as a group from a 20 h. p. motor. The tool department, to the south of the locomotive house track, contains the following light equipment:

Guide bar grinder.
Drill grinder.
10 in. lathe.
Grindstone.
Brass turret lathe.
Turret lathe.
Landis grinder.

Adjoining this department, there is a small wedge and shoe planer, which belongs to the general group on the other side of the through service track. The car wheel department occupies the whole southeast corner of the shop, and contains the following equipment:

Double car axle lathe.
Car wheel borer.
Car wheel press.

These three tools, in conjunction with those of the tool department, are all driven in a group from a 30 h. p. motor. Wheels from the line are brought to the shop from outlying points on flat cars. Paralleling the run around track on the south side of the building, there is an adjoining track over which these cars of wheels are brought. Spanning these two tracks at the point indicated, is a light wooden hoist, which lifts the wheels from the car, and places them on the run around track, over which they are run into the shop. At the press they are dismembered, with the axles piled in the storage pile indicated, and the unmounted wheels along the east side as indicated, in piles at right angles to the wall. The completed wheels are run out over the same track to the transfer table, and stored on the southerly stub tracks on the op-



Plan of Locomotive Shop, with Machinery Location, Canadian Pacific Railway, North Bay, Ont.

posite side of the transfer table, the policy adopted being that of storing sufficient wheels during the slack period to provide for the exigencies of the rush season.

The old machine shop has been rearranged so as to form enlarged blacksmith and boiler shops. The boiler shop contains a boiler plate roll and a double punch and shear, while the blacksmith shop contains, apart from the special departments, six fires and anvils, and a 600 and a 1,600 lb. steam hammer. The spring shop, a department of the blacksmith shop, contains a spring furnace, iron table and tank. The tube shop contains a tube furnace, tube welder, and a tube cutter, with a flue rattler just outside an adjacent door, served by a shop track that connects with the outside, over a small turntable.

The shops have been in operation about a year, long enough to develop normal conditions of production. The normal monthly output is 8 locomotives a month, and it is expected that this will be still further bettered as improved methods are introduced from time to time. A number of time saving devices are in use, several of which have appeared from time to time in the Railway Mechanical Methods and Devices section of Canadian Railway and Marine World. In addition to the heavy locomotive repairs, running repairs are handled for the locomotive house. Conditions in such a shop are somewhat different from those in the usual back shop, as all the machine shop work for the car department is also handled, one section of the shop being entirely reserved, as explained, for car wheel work. The shop is in charge of A. H. Kendall, General Foreman, to whom we are indebted for the information on which this article is based.

Roadmasters and Maintenance of Way Association Convention.

At the annual convention at Chicago recently, the attendance was large, and there was an exhibit of track materials, tools and appliances. Following are abstracts of the committees' reports:

Power-Operated Track Tools and Appliances.—This report, presented by J. W. Dahl, N. Y. Central Rd., opened with an explanation of the increasing use of machinery in track work, owing to its economy as compared with hand labor and to the increased weight and size of many parts used in track construction. Motor cars in place of hand cars save time and energy of the track men, and enable the same number of men in a gang to do more work or a smaller number of men to do the same amount of work as when equipped with hand cars. Rail handling machines for loading rails on cars and distributing new rails from cars not only do the work more expeditiously but eliminate the rough handling which may result in damage or fracture of the rails. For rail renewals, there are machines which, with three to six men, do the work otherwise requiring a large gang of men to handle long and heavy rails.

Other uses of machinery are in such heavy work as ditching, the distribution of ballast, and the spreading of filling material; and also in such light work as drilling and cutting rails, boring and dressing ties, driving screw spikes, tamping ballast, etc.

Rail Renewals.—This report was presented by A. M. Clough, N. Y. Central Rd., and was discussed at great length in regard to the various phases of the work. There was considerable discussion as to whether or not ties should be respaced when new rails are laid, and the general opinion was that this is not necessary, while eliminating the work greatly reduces the time consumed. Several railways now leave the ties alone, simply dressing them at the rail seat where necessary, and adjusting them to give proper support at the joints. The report submitted the organization for a rail renewal force, but some members were inclined to object to this, since no two roads would have the same conditions or use exactly the same force.

Organization or Labor and Material for Track Maintenance.—This report was presented by P. J. McAndrews, Chicago & Northwestern Ry. It showed the great amount of money expended under the direction of the track department (averaging $10,000 a month per roadmaster), and advocated a system of organization in which the work of all the roadmasters of any one division would be under the supervision of some official who would direct the work of the division as a whole. This would avoid the trouble and expense due to operating separate work trains, rail-renewal gangs, extra gangs, etc., on each roadmaster's district. The report recommended the maximum length of line for the roadmasters or supervisors as follows: 50 miles of double track, 100 miles of single track with heavy traffic or 125 miles in easy country with light traffic.

Another important recommendation was that track forces should be maintained permanently, throughout the year. At present, every railway cuts its force to a minimum in winter and increases it in the spring, when the supply of efficient men does not equal the sudden demand. This results in loss of time and money due to the continual employment of new and inexperienced men. Much of the work can be done as well in winter as in summer, and the work as a whole would be done better and at lower cost if spread over the year instead of concentrated in a few months, as under the present system. There was general agreement with the suggested system, but it did not appear that any roads have yet introduced it, the economies of track labor not being comprehended as a rule by railway officers.

Track Accessories.—This report, which was presented by M. Donahoe, Chicago & Alton Rd., dealt with a variety of matters, and the first of these were discussed in such detail that the remainder of the report was accepted as information, without discussion. In regard to rail joints, the committee recommended 24-in. angle bars, with four bolts, supplemented by a base or bridge plate where traffic is heavy. For frog guard-rails an 8-ft. length was recommended, but this was struck out, as there was a general opinion that longer rails are preferable, and that it is not desirable to specify the length.

There was considerable discussion as to whether bolts or clamps are the better for securing the guard rail to the track rail, and as to the use of tie-plates and rail braces at guard rails. Cast manganese guard rails were mentioned, but the members present had little experience with these. Other matters covered by the report were switches, frogs, switchstands, tie-plates, rail anchors or anti-creepers, screw spikes and drive spikes, track bolts of nickel-chrome steel, and the narrow-head "frictionless" rail for curves.

As to this last, only one member had experience, and he spoke of tests showing that with a train on a heavy grade the speed increased on curves having this rail on the inside, while it decreased on curves laid with ordinary rails. Some members spoke of getting the same result by shifting worn rails from the outer to the inner side of the curve, but it was pointed out that in such cases the weight of the wheel comes on the overhanging side of the rail head and not directly over the web, as in the special narrow-head rail. Consequently this shifting of worn rails or curves was hardly desirable for track with heavy traffic and high speeds.

Clearing and Policing Right-of-Way.—This report was read by J. P. Corcoran, Chicago & Alton Rd. It dealt with such work as the cutting of weeds and grass, removing old rails and ties, the handling of scrap, maintenance of ditches and fences, and the clearing of yards and station grounds. Trackwalking and bridge inspection were included also. The report recommended the old practice of requiring the trackwalker to do all kinds of miscellaneous work during his trip, but this was objected to in the discussion. It is better for him to be simply an inspector, doing only such work as is essential to the safety of the track. The miscellaneous work of driving loose spikes, repairing fences, etc., can be done to better advantage in periodical trips of the entire section gang.

Officers for 1914-15 were elected as follows: President, P. J. McAndrews, C. & N.W. Ry., Belle Plaine, Ia.; Secretary, L. C. Ryan, C. & N. W. Ry., Sterling, Ill. The next meeting will be held at Chicago in Sept., 1915.

Birthdays of Transportation Men in November.

Many happy returns of the day to—

F. W. Alexander, A.M. Can. Soc. C.E., Division Engineer, Alberta Division, C.P.R., Calgary, born at Fredericton Jct., N.B., Nov. 22, 1878.

J. O. Apps, General Baggage Agent, C.P.R., Montreal, born at Tara, Ont., Nov. 9, 1877.

A. B. Atwater, Assistant to President, lines west of Detroit and St. Clair Rivers, G.T.R., Detroit, Mich., born at Sheffield, Ohio, Nov., 1845.

G. B. Burchell, ex-General Manager, Maritime Coal Ry. and Power Co., Montreal, born at Sydney, N.S., Nov. 1, 1877.

J. R. Cameron, Assistant General Manager, Canadian Northern Ry., Winnipeg, born at Truro, N.S., Nov. 5, 1865.

L. D. Chetham, City Passenger Agent, C.P.R., and District Passenger Agent, Esquimalt and Nanaimo Ry., Victoria, born at Matlock, Eng., Nov. 5, 1869.

F. H. Clendenning, Division Freight Agent, B.C. Coast Service and Ocean Steamship Lines, C.P.R., Vancouver, B.C., born at Montreal, Nov. 9, 1881.

F. Conway, City Freight and Passenger Agent, C.P.R., Kingston, Ont., born at Ernestown, Ont., Nov. 19, 1850.

A. S. Cook, Inspecting Engineer, National Transcontinental Ry., Ottawa, born at Penobsquis, N.B., Nov. 20, 1873.

W. L. Crighton, Advertising Agent, Canadian Government Railways, Moncton, N.B., born at Derby, Eng., Nov. 9, 1871.

W. B. Cronk, ex-General Superintendent, National Transcontinental Ry., now of Toronto, born at Footville, Wis., Nov. 11, 1862.

A. C. Douglas, Purchasing Agent, British Columbia Division, C.P.R., Vancouver, born at Montreal, Nov. 10, 1881.

W. Downie, ex-General Superintendent, Atlantic Division, C.P.R., born at Rock Currie, Ireland, Nov. 12, 1850.

Jos. Dubrule, jr., Manager, Canadian Paci-

fic Car and Passenger Transfer Co., and President, Prescott and Ogdensburg Ferry Co., Ltd., Prescott, Ont., born at Spencerville, Ont., Nov. 14, 1872.

R. L. Fairbairn, General Passenger Agent, Canadian Northern Ry., Toronto, born at Stillwater, Minn., Nov. 24, 1880.

P. J. Flynn, Terminals Manager, Winnipeg Joint Terminals, C.N.R., G.T. Pacific Ry. and National Transcontinental Ry., born at Fishers, N.Y., Nov. 22, 1872.

Grant Hall, General Manager, Western Lines, C.P.R., Winnipeg, born at Montreal, Nov. 27, 1863.

John L. Hodgson, Master Car Builder, G.T. Pacific Ry., Transcona, Man., born at Simcoe, Ont., Nov. 15, 1858.

W. M. Hood, Travelling Passenger Agent, Canadian Northern Ry., and Canadian Northern Steamships, Ltd., Toronto, born at Harrow, Ont., Nov. 25, 1872.

N. B. Jones, Car Foreman, C.P.R., Kenora, Ont., born at St. John, N.B., Nov. 9, 1869.

W. E. Ladley, Superintendent of Motive Power, Reid Newfoundland Co., St. John's, Nfld., born at Leeds, Eng., Nov., 1875.

C. E. Legg, Trainmaster, Winnipeg Terminals, C.P.R., born in Illinois, Nov. 15, 1864.

J. McGillivray, General Manager, Inverness Ry. and Coal Co., Iverness, N.S., born at Nairn, Scotland, Nov. 13, 1867.

J. McMillan, General Superintendent of Telegraphs, Western Lines, C.P.R., Winnipeg, born at Liverpool, Eng., Nov. 2, 1866.

A. S. Munro, Commercial Agent, G.T.R., London, Ont., born at Hamilton, Ont., Nov. 10, 1880.

C. Murphy, General Superintendent, Manitoba Division, C.P.R., Winnipeg, born at Prescott, Ont., Nov. 20, 1865.

A. C. O'Neil, Travelling Freight Agent, G.T.R., London, Ont., born at Point Edward, Ont., Nov. 30, 1866.

W. J. Quinlan, District Passenger Agent, Grand Trunk Pacific Ry., Winnipeg, born at Montreal, Nov. 21, 1883.

F. E. Rutland, Agent, C.P.R. Stockyards, Winnipeg, born in Essex, England, Nov. 17, 1868.

H. P. Sharpe, General Agent, Dominion Express Co., Toronto, born at Brockville, Ont., Nov., 24, 1864.

G. H. Shaw, General Traffic Manager, Canadian Northern Ry., Toronto, born at Smiths Falls, Ont., Nov. 25, 1859.

F. M. Spaidal, General Superintendent, Quebec Grand Division, Canadian Northern Ry., Montreal, born at Gananoque, Ont., Nov. 13, 1858.

J. Sparks, Assistant General Baggage Agent, Western Lines, C.P.R., Winnipeg, born in London, Eng., Nov. 25, 1874.

J. G. Sutherland, Car Service Agent, Alberta Division, C.P.R., Calgary, born at Aulac, N.B., Nov. 24, 1882.

H. P. Timmerman, Industrial Commissioner, Eastern Lines, C.P.R., Montreal, born at Odessa, Ont., Nov. 6, 1856.

H. E. Whittenberger, General Superintendent, Ontario Lines, G.T.R., Toronto, born at Peru, Ind., Nov. 9, 1869.

C. G. Washbon, Trainmaster, C.P.R., Brandon, Man., born at Morris, N.Y., Nov. 27, 1887.

The 24 hour system of time, which has been used on the Western Lines, C.P.R., and on the Intercolonial Ry., for some years and was adopted by the French railways in 1912, is now said to have been adopted in Belgium, Italy and Uruguay.

An order to test all air compressors and other air brake equipment on passenger and freight locomotives before they leave the locomotive house, on one road, has cut the number of air pump failures in half in one year.

Extensive Improvements on the Dominion Atlantic Railway.

The Dominion Atlantic Ry.'s main line extends from Yarmouth to Windsor, N.S., 170 miles, and it operates through to Halifax, having a lease of the Intercolonial Ry.'s Windsor Branch from Windsor to Windsor Jct., 31 miles; and from Windsor Jct. to Halifax, 14 miles, it has trackage rights over the I.R.C.'s main line. Its Cornwallis Valley Branch extends from Kentville to Kingsport, 14 miles, and its Midland Division from Windsor to Truro, 58 miles. In 1911 the D. A. R. was leased to the C. P. R. for 999 years. Since then a very large amount of work has been done to improve its physical condition and bring it up to C. P. R. standards. A large number of bridges and structures have been replaced, etc., as follows:

Bear River bridge, 1,530 ft. long, has been replaced with an entirely new structure. The substructure consists of 14 piers and 2 abutments, and the superstructure of four 156 ft. truss spans, six 100 ft. d.p.g.'s, one 85 ft. d.p.g., one 50 ft. d.p.g. and one 144 ft. swing span.

At Clementsport the wooden bridge has been replaced with a steel bridge 930 ft. long. It was necessary to build up on top of the existing piers with concrete, to build one new concrete pier and two concrete abutments. The bridge now consists of 8 piers and two abutments. The superstructure consists of three 148 ft. d.t. spans, one 65 ft. d.p.g., three 74 ft. d.p.g.'s, and one 156 ft. swing span.

At Bridgetown the existing light span has been replaced with a standard 150 ft. through span.

At Gaspereau the present bridge is being replaced by a new one 460 ft. long. The substructure consists of three piers and two abutments, and the superstructure of two 170 ft. through spans and two 83 ft. h.t.g.'s.

At Windsor the present light bridge is being replaced by a new structure 1,080 ft. long. The substructure consists of 9 piers and 2 abutments, all of concrete. The superstructure consists of four 150 ft. t.t. spans and six 85 ft. h.d.p.g.'s. This bridge is not entirely completed, three piers remaining to be finished. The steel is being erected.

At Shubenacadie the small lift span has been replaced with a 130 ft. d.p.s. span. It was necessary to build 1 new pier and 1 new concrete abutment.

At Big Joggins the wooden trestle and wooden swing span have been replaced by a 120 ft. d.s. span; filled 785 ft. of the trestle approaches, renewing entirely the remaining 180 ft. of trestling.

At Little Joggins the wooden bridge has been replaced by a 40 ft. d.p.g., and 545 ft. of the bridge has been filled.

At Allen's Creek the wooden bridge, 325 ft long exclusive of the wooden approaches, has been replaced by a new bridge. The substructure consists of 2 piers and two abutments, all of concrete, and the superstructure of one 150 ft. t.t. span and two 85 ft. t.p.g.'s, with standard trestle approaches at both ends.

At Weymouth the wooden bridge, 1,280 ft. long, is being replaced by a steel bridge. The substructure will consist of 13 piers and 2 abutments, all of concrete. The superstructure will consist of three 156 ft. deck trusses, two 100 ft. lattice girders, two 85 ft. d.p.g.'s, one 136 ft. p.g.d.s., and the remainder will be 50 ft. d.p.g.'s. The substructure of this bridge is nearly completed and the superstructure will be placed during the winter.

At Cambridge bridge and Jordantown subway two 30 ft. girders have been placed.

The old Hantsport aboiteau is to be replaced with a new structure.

In addition to replacing these large wooden bridges by steel ones a number of trestles have been replaced by concrete arches and fills, and a number of the smaller wooden bridges by concrete rail top culverts. Numerous wooden culverts have also been replaced by concrete pipe, small arches and cast iron pipe. One 10 ft. concrete arch, six 8 ft. concrete arches, six 6 ft. concrete arches, and four 4 ft. concrete arches have been built. Seven 36 in. concrete pipe culverts, ten 30 in. concrete pipe culverts, seven 24 in. concrete pipe culverts, 24 cast iron pipe culverts, four 14 ft. rail top culverts, one triple 10 ft. rail top, one double 10 ft. rail top, one single 10 ft. rail top culvert, two 8 ft. rail top concrete culverts, and eight 6 ft. rail top concrete culverts have been put in, and concrete rail tops have been placed on eight culverts that previously had wooden decks and stone abutments.

In round figures, 6,000 lin. ft. of wooden bridges have been replaced or will be replaced very shortly by steel bridges, concrete arches and fills and rail top culverts. The quantity of material required in making these fills amounts to over 425,000 cu. yds.

About 45 miles of track have been reballasted, 30 miles of new 85 lb. rails have been laid and 120 pit cattle guards have been filled and replaced by surface guards.

The water tank at McDonald's, on the Midland Branch, is being replaced by a 10 in. C.P.R. standard stand pipe, and an earth dam some 25 ft. high at the deepest, and 100 ft. long, is being built to form a storage reservoir. At South Maitland, also on the Midland Division, a 10 in. C.P.R. standard stand pipe is being installed, and the pipe line is being carried to a lake about a quarter of a mile from the track and 140 ft. in elevation above it; 25,000 or 40,000 gallon water tanks have been built at Windsor, Middleton, and Hectanooga, all on the main line. 100-ton track scales have been installed at Yarmouth and Annapolis Royal, built in the most substantial manner with concrete scale pits.

New brick stations have been built at Wolfville, and Annapolis Royal, and new stations at Mosherville, Patterson's and Imbertville. During the past two years 35 stations have been repaired and painted, and platforms have been repaired.

A new wharf has been built at Yarmouth, with a new trestle approach from the main line, to enable the trains to be more conveniently located on the wharf for taking and putting off passengers for the Boston steamboats, and a new and larger freight shed has also been built on this wharf.

A new line, the North Mountain Branch, is being built from Centreville to Weston, 14 miles, in the most substantial manner, all the culverts being concrete arches, concrete pipes or cast iron pipes, and the stations are to be set on concrete or masonry foundations. It is expected that this line will be completed and open for service by Jan. 1.

The above, with the exception of the station repairs, has reference only to the permanent work done. In addition the majority of the existing trestles have been greatly repaired and strengthened to bring them up to standard. Many of them have been entirely renewed.

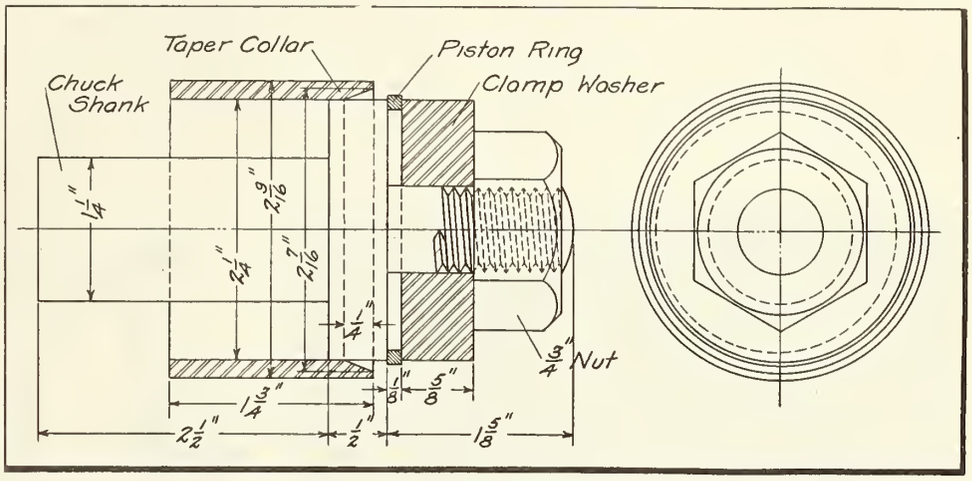
With fuel oil, it is claimed that it is possible to greatly increase the capacity of a boiler without a marked decrease in the boiler efficiency.

Railway Mechanical Methods and Devices.

Air Valve Piston Ring Centring Device in Timiskaming and Northern Ontario Railway Shops.

Piston rings for the air valves of locomotive air compressors are made slightly eccentric, and cut on the thin side to give the requisite spring to cause them to form a good tight joint. The piston rings are made from a long ring, from which a large number may be cut. The outside of the stock sleeve is turned to a diameter larger than that finally required, and then the sleeve is offset the required amount, and the inside bored to a correspondingly larger diameter than that of the final inside diameter of the piston ring. The stock sleeve is then cut to form rings of the necessary thickness. These rings are slotted at an angle of 45 degrees to form the spring allowance, and sprung altogether at that point.

In springing the rings together the varying radial thickness of the rings causes them to assume a final shape when compressed that is not a true circle, so that it is essential to take a light final cut over the outer face, so that they will form a true fit inside the cylinder. The object of the device illustrated herewith is to chuck the work so that this final truing may be quickly accomplished. The device consists of a main body, with a shank at one end for chucking in the lathe, and a threaded shank at the other end, over which a washer for clamping is slipped, and secured in position by a ¾ in. nut. Over the main body of the device there is a collar, fitting closely, the inner bore of which at the clamp washer end is tapered.



Air Valve Piston Ring Centring Device.

The operation is simple. The ring to be finished is placed between the main body and the clamp washer, which is loosely fitted up to the ring. Over the body the taper collar is slipped, and forced over the piston ring, compressing the latter, and at the same time centring it with regard to its outside diameter. When compressed to the limit the clamping nut is tightened, and the taper collar slipped off from the main body, which is then chucked in the lathe by the chuck shank, and the outside of the ring trimmed down to a true circle.

This tool is devised by E. McGahey, machinist in the shops, who states that particularly rapid work may be accomplished with it, producing a ring that has not the same tendency to leak as an ordinary ring that has not been re-turned will have.

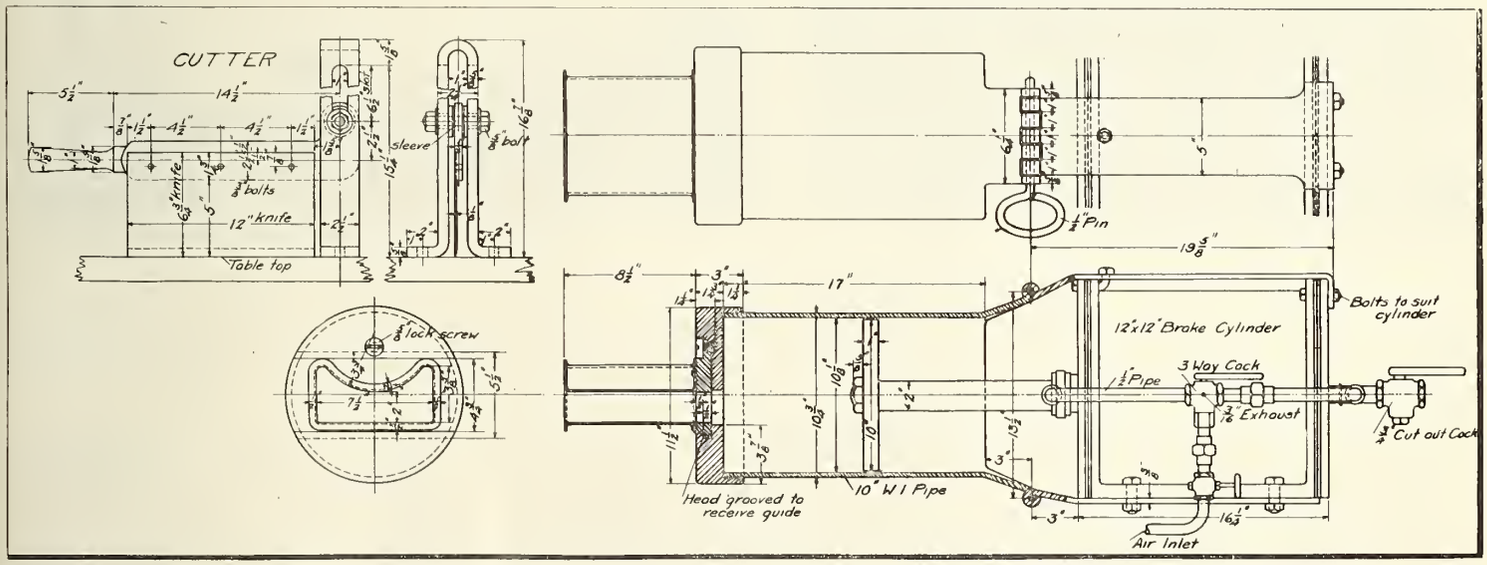
Grease Press for Driving Box Cellars on Canadian Northern Railway.

The C.N.R. mechanical department has developed a standard design of grease press for forming grease cakes to be used in driving box cellars. Nearly every railway shop has a grease press of some kind or other, so their object and use is familiar to all, and it will only be necessary to deal with the construction of the machine.

The press consists essentially of two cylinders, hinged to each other in such a one has a handle, in order that it may be withdrawn. The front end of the grease cylinder has a cast iron cap screwed on, across the face of which there is a recessed space into which the die head slides. There is an opening in the die head, slightly larger than the largest size of grease form that will be pressed. The die is also of cast iron, fitting in the head as explained, and on the forward face of the die there is a formed copper piece 3-16 in. thick of the same cross section as the pressed grease, guiding grease after it passes through the die. The piston in the grease cylinder is ⅛ in. less in diameter than the bore.

A feature of this device is the convenient manner of refilling the grease cylinder after the contents have been pressed out. By removing the upper hinge pin, the cylinder may be dropped into a vertical position, first of all drawing the piston back into its rear position. In that position, the cylinder is filled, and lifted into the normal position when it is ready for service. To operate, air is admitted to the rear of the power cylinder piston by the arrangement of piping on it, the cylinder forcing the grease piston into the grease cylinder, this forcing the grease through the die and guiding sleeve to a supporting board, which is placed in front. Three grease cakes for a 10 by 12 in. driving box can be made with one filling of the cylinder.

A special knife devised for cutting the long die formed piece of grease, is shown



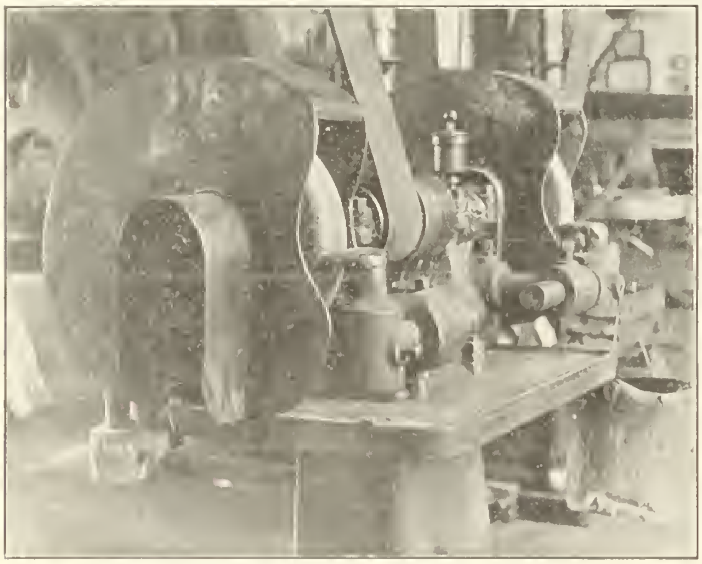
Grease Press for Driving Box Cellars, showing also the Cutter for Sectioning the Formed Grease Strip.

in the same illustration. It consists of a U frame supported on a table, the arms of the U being slotted to allow of vertical adjustment of a bell crank arm, the long arm of which forms the handle. A knife blade is fastened to this long arm, the cutter acting like a guillotine.

Machinery Guard in Timiskaming and and Northern Ontario Railway Shops.

In view of the widespread safety first movement, it is interesting to note the different manner in which the railways are helping the movement along. While accomplishing the same results, each railway has a different method of going about its task, and in fact a wide range of ideas along these lines will be found in shops on the same railway.

The T. and N.O. Ry., in its shops at North Bay, Ont., is, in as far as possible, protecting all its shop machinery, a typical example of which is shown in the protected emery wheels in the accompanying illustration. This protecting hood is quite detachable, and in no way interferes with the operation of the wheels. The circumferential part of the hood consists of a wrought iron strap, 4 by ¾ ins., bent to shape, and with the lower end drawn down to a 1 in. diam. This round stem end fits into a casting, which is bolted to the underside of the grinder table at the back. The hood is secured in this casting by a set screw. The side members of the hood consist of ⅛ in. plate, secured to the ¾ in. face of the circumferential strap by ¼ in. studs, cut off short and rivetted flush. These side sheets are flanged for the shaft openings, and a similar piece of ⅛ in. sheeting, rivetted to the flange mentioned, forms a complete protection from the shaft. The wheel is thus completely protected, the greater strength of the hood being in the periphery, where it is required.



Strong Protecting Hood for Emery Wheel.

Another good instance of machinery protection is shown in the protection given to the gearing on a large locomotive lathe. The whole outer face of the gearing is covered by a large sheet, with an edging conforming to the contour of the gear arrangement. The whole guard is hinged to the floor, so as to fall away from the lathe when swung, a hinged rod in the centre of the side sheet forming a support to prevent the hood from dropping to the ground. These guards have been applied by E. McGahey, a machinist in the shop.

Handling Wheels in Canadian Pacific Railway Shops at North Bay.

Instead of the usual practice of fitting axles to the bored wheel, at the C.P.R. shops at North Bay, Ont., the wheels are fitted to the axles, and it is claimed thereby that a considerable saving both in time and material is obtained. Observations made on axles that have had the wheels pressed off, showed that over 50% of them required no turning at all, and were in such shape as to be capable of pressing on again, without further machine work.

It is the practice in these shops, when the wheels have been pressed off in the usual manner, to put each axle in the lathe between centres, and try the wheel fit for accuracy. While generally not requiring much truing, it is usually advisable to take a feather cut over the full length, with a slight taper at the entering end. This cut requires but the fraction of the time usually employed in taking a heavy cut over the full length, the cut now being taken, usually not even removing all the discolored surface. The wheels are usually removed from the axles owing to their being worn beyond a serviceable condition—or possibly one of a pair is in this condition, or else has some defect. Mated wheels are selected for applying to the axle, and these are bored to suit.

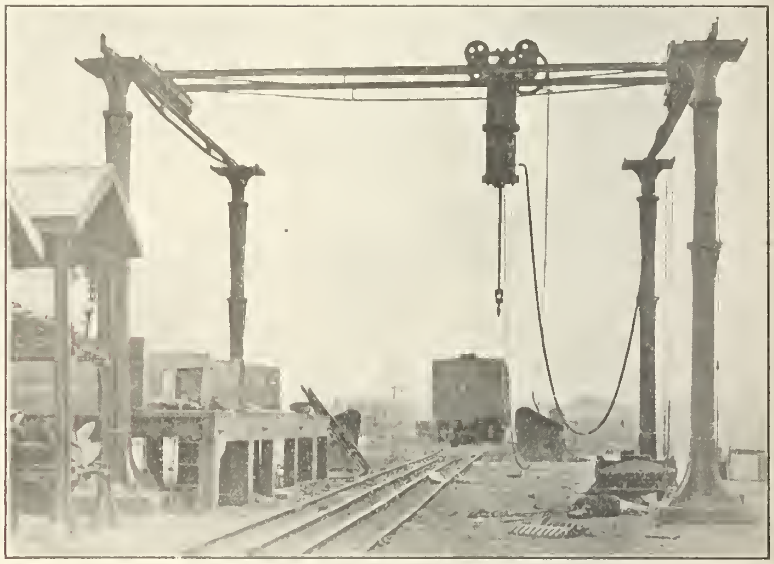
The shop output is about 40 pairs of wheels a day. The wheels for these are bored in a wheel borer that operates night and day. An axle lathe operating a 9 hour day can supply the full requirements of the wheel borer. Formerly, when it was the practice to fit the axle to the wheel, it required both a wheel borer and axle lathe operating night and day to give an even smaller output. This means a direct saving of a machine and operator at night, in addition to an increased output. As it is usually the failure of the wheel and not of the axle that necessitates the shopping, there is an added advantage in conserving the size of the axle, making it possible to pass through a greater number of shoppings, all the machining coming on the wheels.

A number of United States railways, having offices in Toronto, have appealed against the city assessing them for business purposes, and their representatives for income, claiming that they do not do business in Canada within the meaning of the act.

Yard Crane at Grand Trunk Railway Locomotive House, Allandale.

Adjoining the scrap bins of the G.T.R. locomotive house, at Allandale, Ont., there has been erected a small travelling crane, as shown herewith, for handling the various heavier parts that must be cared for at a divisional point. The crane runway consists of four old cast iron columns, removed from the company's old shops at Stratford, Ont., two on each side of the runway, each pair of which is spanned by a trussed rail, which forms the crane track. The crane consists of a pair of trussed rails, suitably mounted at the ends to small carriages, which run on the runway. A small crane carriage, operating on the crane rails, carries an air plunger hoist.

The primary object which led to the installation of the crane, was the demand for some means of lifting tender tanks from off the tender trucks for repairs. For this service it has proved quite valuable. An additional service to which it is put, is the handling of the scrap material from the small shop trucks to the scrap bins on the left. It is also of use in handling castings sent from the back shop to the locomotive house, lifting them from the flat cars, and placing them on the small shop trucks, tracks for which run under the craneway.



Travelling Crane for Locomotive House Service.

Central Ry. of Canada Discussed in British House of Commons:—Mr Sheehan asked the President of the Board of Trade in the Commons recently whether, having regard to the time which had elapsed since he promised to make inquiries into the position of the Central Ry. Co. of Canada, and to the fact that the principal question involved was its failure to comply with sec. 274 of the Companies Consolidation Act, he could state whether it was bound to comply with this section by reason of its having a London place of business at 363 Winchester House, E.C., and a London committee consisting of Sir Thos. H. C. Troubridge, T. Carmichael and A. L. Cohen; and, if so, would he take immediate steps to enforce the penalties imposed by the act upon companies who failed to comply with the requirements of the section in question? The President of the Board of Trade said in reply:—"Careful inquiries have been made, and the facts are now before Crown counsel with a view to advise whether proceedings can be instituted."

Statistical Control of Railway Operations.

By W. M. Baxter, Special Investigator on General Manager's Staff, Eastern Lines, C.P.R.

In the early days of railroading, the use of statistics as a means of controlling the operations was very imperfect. Competition was not usually important and the railways were of short mileage, reaching only a limited territory. The margin of profit was large on rates amounting to only a fraction of the cost of hauling similar goods in wagons or on pack trains. But the profits of the enterprise lured much new capital. Competition became keen, lines were extended, rate wars took place and the solvency of railways soon became a matter of careful management.

The business of a railway may be divided into two distinct departments, namely, acquiring traffic and moving traffic, which is similar in industrial enterprises to the selling end and the manufacturing end. A railway manufactures and sells transportation. The great difference between the producing of the railway's commodity and that of a flour mill, or coal mine, from the viewpoint of management, is in the fact that the plant and equipment of the railway is dissipated or spread over a large stretch of country, while that of the flour mill or coal mine is concentrated, so that all supervision must be delegated, most of the work being done by transportation units, which are continually changing their location, so that they cannot be supervised except in a scattered manner. An unusually large number of employes must work without supervision and the margin of operating profit is exceedingly small, when compared to the average returns on the investments in manufacturing and farming. The gross earnings for 1913 of Marshall Field & Co., Chicago, America's largest wholesale dry goods firm, was $2,000,000 greater than that of the Illinois Central Rd., and the interest on the investment was 14%, while that of the Illinois Central was 6%. You can well imagine the furore and condemnation and the howl of watered stock that would have been evinced, from the public and politicians, if this railway had earned 14%. The Interstate Commerce Commission would more than likely have been in night session.

As the general manager usually spends the larger portion of his time in inspection, and under normal conditions seldom directs the movements of trains, he sees but an infinitesimal volume of the company's business moved. As the scope of his vision is limited,. other methods must be resorted to in order to check the operation. The means of accomplishing this is to separate the operation of the road into rigid and definite units and then to compare these units with similar ones on other roads, or with the same road at various periods, or with arbitrary standards chosen as guides, or bench marks. Controlling a railway by means of statistics might be defined as the process of determining the unit in each operation and then maintaining these units as nearly rigid as possible, seeing that they are collected, reported accurately and promptly.

The basic operating unit in freight traffic is the ton-mile, which is the product of the ton and the distance. The basic unit in passenger traffic is the passenger mile. There are six important statistical units deducible from these two fundamentals, which are defined as follows: 1. The average train load, either freight or passenger, is obtained by dividing ton mileage and passenger mileage by train mileage. 2. The average car load, freight and passenger, obtained by dividing ton mileage and passenger mileage by the respective car mileage. 3. The average length of haul for passengers and freight respectively, obtained by dividing passenger mileage and ton mileage by the total number of passengers carried and the total tons moved. 4. Ton miles per locomotive hour obtained by dividing the locomotive ton miles by the number of hours the locomotives are in service. 5. The average revenue per passenger mile and per ton mile, obtained by dividing the freight receipts by ton miles and passenger receipts by passenger miles. 6. The average density of traffic per mile of road, obtained by dividing ton miles and passenger miles by the length of road. It is unfortunate that this data cannot be given to the executives earlier than 5 or 6 weeks after the operations have occurred, owing to the enormous concentration and calculations which must be resorted to in arriving at them on a large system economically. While they are of final value in determining the general efficiency of the system, it is necessary to have a more immediate check in the form of current records.

Perhaps the most tangible source of daily information is the train sheet, which is received by the train masters, and superintendents, from the dispatchers. This sheet records the movements of all trains on the division, showing their consist as to loads and empties and number of cars in the train, and sometimes shows the number of passengers carried on each of the passenger trains, as well as the general movements of traffic, the observance of schedule time, the cause of delays and weather conditions. By this means of concentrating upon a number of primary officers as much first hand detail information as they can absorb, the foundation of statistical control has been laid. The results of these primary officers' observations are collected and passed on to their next superior, who receives similar reports from many such primary officers and in this way the operations of the road and work performed is reported with diminishing detail, until the chief executive is reached.

The division superintendent is undoubtedly the most important primary officer. The operation of his territory is reported to him daily, and frequently on congested terminals he receives certain information hourly. In addition to this daily data, he has a number of statistical sheets prepared monthly, which show in condensed form, sometimes graphically, the comparative results of a large number of operations on a division, one month as against another, one day as against another, and one year as against another. When these records are graphically presented the sheets are ruled with a number of vertical lines, representing the number of days in a month, or the months in a year, or in other words, progress of time, while a horizontal ruling to scale represents volume or quantity, as is shown in the illustration. In this way the directing officer can readily see for example what has been the average tons per train mile, and the average pounds of coal consumed per 1,000 ton miles for a certain district or territory for a number of months, compared with the same months of the previous year, or if the records have been kept for a number of years fair indication will be had of the season's effect on the traffic.

The important daily returns which a superintendent receives are those showing the number of trains of loaded cars, empty cars, and total cars received and forwarded in each direction at all of the terminals, also this same information for train movements at important intermediate points. He must know the entire train movement and the tonnage movement, and the failure to perform a given service of these movements as expressed in delays and other causes, must be thoroughly investigated and remedies applied. He is informed about the conditions of each of the yards and terminals on his division and also about outside important terminals, which may affect movements in his territory. He knows the demand for freight and passenger equipment and the class of each required at the various points, as well as the available supply, and the condition and amount of power to move it. All of this information is of a statistical nature.

The officer next superior in rank is the general superintendent. He has received through the superintendents statements showing by divisions the number of locomotives assigned, total number of through locomotives shown on the train sheets, the number of thorough freight locomotives out of a shop and available for service before a specified time, usually at midnight, the number of through freight locomotives in shop for repairs and reported as coming out within 24 hours, and those which will not be completed in 24 hours, and also the average mileage made by these locomotives in service, special locomotive assignments, such as wayfreights, passenger locomotives, switch locomotives, work trains, pick-ups, etc., together with general remarks on the entire power situation. He also receives reports on the cars handled at stations, showing the number of cars of merchandise on hand and when unloaded, together with information relating to special car movements. He is also notified concerning traffic exchange at all foreign line connections and if there is a special traffic, originating in his territory, such as coal mining, or some big manufacturing industry, he is advised of the number of cars moved and supplied, and a statement of detentions and their causes, as well as a report on the weather. While these are the principal reports he receives there are numerous special and minor statements furnished or compiled in his office daily, weekly and monthly, which are beyond the scope of this article.

It is evident that no general superintendent could exercise close watchfulness over the thousands of separate items which these reports cover, and in reality he does not. A man in this position not trained on the property could not make efficient use of them, as the information gained is not so much absolute as relative. As the great majority of the data he thus receives must be judged comparatively to be of use, the graphic method of recording statistics is perhaps most practical and is instantly read. The general superintendent, being familiar with all the conditions of his territory and knowing how it ought to operate, can look for the deviations from the results he is expecting. It may be fairly said that his system of control is by deviations from known standards.

The general manager, however, receives a smaller number of reports dealing only with the principal topics. All of these general considerations and many other local ones, the managing executives have clearly in their minds, but accurate statistical information must be the basis of their judgment in any specific case. They must receive constant advices relative to the current productive power of various localities on the system, the state of the wheat crop, the lumber market, or seaport traffic, so as to be able to foresee the possible future re-

quirements necessary to handle the business expeditiously. This is again a matter of statistical organization, but it can be made to yield large results in actual operating efficiency.

The traffic department and the operating department must work hand in hand in their investigation of anticipated business, although from different motives. The traffic manager is interested primarily in car supply and train service. It is his duty to secure the largest possible number of routings of business actually in sight, and also devise means for creating business that is not in sight. His business is divided into two main classifications, local traffic and competitive traffic, and he requires daily statistics to show how his local traffic compares with his expectations or with other seasons, and it is of great importance to him to know how his local agents are handling the competitive situation. Even the local traffic is probably competitive with the traffic of other roads serving other markets, and the traffic manager must gauge the prosperity of his local industries largely in terms of their output, and this can be done only by comparative statistical data.

The intricacies of the mechanical department are perhaps most susceptible to statistical control. It deals with plain units in great variety, as for example, pounds of coal consumed per specified service as per train mile or ton mile, or locomotive miles between stoppings or axle miles per hot box. There are really myriads of details in the mechanical performance of cars and locomotives, which can be standardized by means of statistical records. And deviations from these selected or normal standards will show up in great contrast, thus plainly denoting where investigation and remedy is needed. The superintendent of motive power and his primary officers are continually engaged in these investigations.

Statistics of earnings and expenses are the ultimate check on all of the road's records, and when taken in conjunction with the statement of work performed and shown graphically, present the final picture of the system. Without knowledge of the work done, however, earnings and expenses are not an adequate means of control. Many roads west of the Mississippi River in the United States, operate for 60% of gross earnings or slightly less, while in the east the average is near 70%. Thus the operating ratio is an uncertain test of efficiency. The high rates in the newly settled parts of the country make relatively easy a showing which the best operation in the world could not accomplish in a territory of intense competition of long duration, where the struggle for business has reduced the margin of profit of the railway to a minimum. These comments apply primarily, of course, to the statistical use of the operating ratio by the banker or broker, or student of railway affairs who is trying to judge one property in terms of another. The manager of the road confronted habitually by the same set of conditions can form a great many accurate opinions from the reported earnings and they are of the highest statistical importance to him. Where detail knowledge of the property is absent, however, there could scarcely be a more perilous standard of railway efficiency than the relation which operating expenses bear to earnings. A road in mountainous country must pay relatively high sums for every ton moved, because of the necessity of double heading or of breaking up trains into short sections. On the other hand, a road operating in a swampy water level territory, as some of the roads in the Mississippi Valley do, are likely to have an abnormal maintenance cost. A road hauling large proportions of merchandise will have a high ton mile rate, but also a high ton mile cost, because of the necessity of rapid service and small tonnage in car loading. A railway operating in the cotton belt, or wheat belt, will fluctuate greatly from one season to another, while a road in Canada will report a marked increase in operating cost during winter.

Similar difficulties confront the banker and broker in making comparisons of efficiency based on the ton mile. When 1,000 tons are moved 100 miles, a service of 100,000 ton miles has been performed, regardless of the nature of the commodity. Some of the railways in Indiana and Illinois, built to haul coal, frequently produce 100,000 ton miles by moving a 4,000 ton train 25 miles, with a single locomotive and train crew. On the other hand, a road loading light manufactured articles might be doing well to load three tons per car, and in this instance it would take a single train moving approximately 1,000 miles, or 40 trains moving each 25 miles, to produce 100,000 ton miles. The worst of it from a statistical point of view is that most railways are moving a thousand different kinds of traffic all at the same time, and cannot always manage even to haul their coal and light manufactured articles in separate trains. The ton mile in consequence is an average figure composed of a multitude of dissimilar parts. This, however, does not confuse the general manager or his assistant. They have been watching the operations of each of the districts for years, and if a new superintendent on a division increases the average loading from 690 to 720 tons, they regard it as a measure of increased efficiency, because they are comparing the results of a known territory at a particular season, under known circumstances with the same territory, and circumstances in another season.

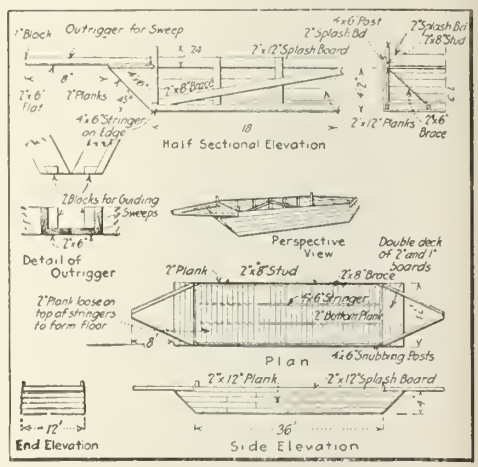
Even this discriminating use of the ton mile, when expressed in terms of average train load, often leads to its own peculiar form of error. When traffic is handled smoothly at efficient speeds, big train loads almost always mean economical operations, because they indicate that the business is being done with the fewest locomotives and train crews. But, if freight is held at terminal points longer than competitors are holding it, in order to collect maximum loading, or if the tonnage ratings are pushed to the limit, with resulting locomotive failures, blockaded traffic, overtime for crews and abnormal coal consumption, the big train load results in expensive economy. This example of an overdone economy is likely charged to statistical government, but it illustrates a point. Statistics are only of use comparatively when measured against similar performances elsewhere, or against a standard arbitrarily chosen and assigned in advance. But the analogy must be a real one. It is useless to compare results obtained with dissimilar commodities, or with the same commodities handled under different conditions of grade, curvature, and motive power.

No consideration of these statistics would be complete without mention of the effect of their use on the staff. In fact, it is possible that in many cases, even if the reports were filed away in the management's office without attention, they would really have achieved their object. If a district superintendent be made to submit an average operating figure, no matter what form the unit may take, and he is then compelled to compare it with previous periods, and the same period in the previous year, and is then asked to explain the increases or decreases, it is sure to make him think and study his territory.

The foregoing paper was read before the Canadian Railway Club, in Montreal, recently.

Contractor's Scow for the Fraser River.

In the construction of the Grand Trunk Pacific Ry. along the Fraser River, in British Columbia, the river afforded the only means of transportation for distributing plant and material to different points at which work was to be commenced. This was a dangerous service, as at high water (the only navigable condition) the river has a swift current with numerous eddies and rapids. From Tete Jaune some of the material was carried in small stern wheel river steamers built for the work by the general contractors, Foley, Welch & Stewart. But the great bulk of the machinery, material and supplies was transported in large scows, carried down by the current, and controlled by a long oar or



Scow for floating material down the Fraser River.

sweep at each end. Steam shovels, dump cars, cement, steel sheet piling, food supplies, etc., were handled in this way, and freighted for distances of 150 to 300 miles.

The accompanying plans show the construction of the scow, of which over 200 were built by the Bates & Rogers Construction Co. of Chicago, contractors for the bridge substructure work. The hull is 36 ft. long on the bottom, 44 ft. on top, 12 ft. wide and 4 ft. deep, with a carrying capacity of 20 tons. At each end is a V-shaped outrigger, with a notch in the end forming a guide for the sweep. All joints are calked. The sides can be raised 12 in. by a line of 12-in. splash boards, but these are used only in rough water or for cargoes liable to be damaged by spray.—Engineering News.

Where some roads formerly considered that a locomotive should receive a general overhauling once a year at least, with an intermediate heavy repairing as well, the time between these general repairs has been extended to two years, and the intermediate repairs are made in the locomotive house. Passenger locomotive mileages have been increased from 75,000 miles to 150,000 miles, with corresponding increases in freight mileage, and in some good water districts the boiler is now the controlling factor, rather than the machinery, as was formerly the case.

The value of uniform spacing of ties under a rail joint appears to be open to question, as observations of supported, suspended and uneven spacing of ties under joints show that all are equally effective in making the track ride well.

Wooden Frame Cars in the Freight Trains of Today.

By G. E. Smart, Master Car Builder, Canadian Government Railways.

A few years ago the 30 ton all wood freight car was considered standard, but since the introduction of steel in car building it has replaced wood and today we have all steel coal cars, all steel box cars, lined with wood inside, and steel underframe cars, of all classes of 40 and 50 tons, and a few of 75 tons' capacity. There are a large number of wooden underframe cars still in service, and the question in regard to these is: What can be done to make this class of car safe to be handled in the long trains and meet the severe usage that they receive in yard switching service of today?

The draft gear problem is certainly the most important. The annual cost of repairs to cars that are damaged through the draft gear failure, and loss and damage claims resulting therefrom exceed all other repairs made to freight car equipment. The question naturally arises: What are the causes of these failures? They are as follows: 1. On account of introduction of heavier power and longer trains. 2. Placing of light and heavy cars together in trains. 3. Rough switching of cars in yard. With regard to the first and second causes: The tractive power of locomotives has increased during the last few years from 20,000 lbs., known as the 100% engines, to about 45,000 lbs., or 225% for locomotives in general use in Canada, and the 2-10-2 type used on United States roads, to 84,000 lbs., and in addition to this type there are in use on certain sections of the country, locomotives of the Mallet type, with tractive power of 110,000 to 120,000 lbs., and, notwithstanding this enormous increase, there is a type of locomotive just placed in service, known as the Erie triplex, with a tractive power of 160,000 lbs., with a haulage capacity equivalent to a train consisting of 250 fully loaded cars each of 50 tons' capacity, 1.6 miles long, and a total weight of 18,000 tons. A few years ago, the average number of cars hauled was 25, the trains being approximately 1,000 ft. long. To-day the ordinary trains are 60 to 100 cars, and a train of 100 cars would be approximately 4,000 ft., or about three-quarters of a mile.

What chance has a wooden frame car under the conditions as they exist today on the front end of such a train? In my opinion it is a very good reason why cars of this class are so often found on repair tracks. If a car of this type was to be traced from the time it leaves the terminal it would be found that it was necessary to remove parts of the load quite often, which, beside the expense of repairs, results in delay to freight en route, and it is the fruitful cause for so many claims on account of damage to freight handling in and out of the car.

The solution of the problem is not altogether the physical characteristics of the car or entirely mechanical. The operating official should co-operate with the mechanical department in reducing the freight car repairs by arranging as far as possible that cars with all steel construction or with steel underframe, or those with steel centre sills be placed in the front end of trains. It is a fact that we find light capacity cars with wood underframe or empty flat cars leaving the terminal on the head end of one of the long trains. And in the majority of cases the cars are billed through and will not be set off between terminal points, unless set off on account of draft gear failure. This, no doubt, could have been avoided had the cars been placed towards the rear of the train before leaving the terminal. There are railways who recognize the necessity of placing weak cars toward the rear of the train, and they provide cards stating that they must not be placed more than 15 cars from the caboose. This indicates that the car is in such a condition that it must be so located in the train, but is safe in ordinary service to be hauled to destination, and if this is done, delay and extra switching on account of draft gear failure along the line would be eliminated, and it would not be necessary to move the lading on account of this feature.

The third cause: rough switching in yard, is a great factor in car repairs. The speed limit for switching in yards is nil, nor are there any rules in force governing the speed of locomotives in switching service. If you were to confer with the car inspectors and obtain their opinion as to where most damage is done to cars, I am safe in saying that their answer would be in the switching yards, as their daily experience in inspecting cars immediately on arrival and after they have been switched in yard will confirm this. This is only a small item as compared with actual damage started in yard and which through the cars being necessarily weakened thereby, is aggravated after leaving terminals, and results in many cases in the cars breaking down before reaching destination. A visit to the freight car yard will convince you that it is just a question how fast the cars can be switched together, the speed that the cars are travelling is not considered, hence cars are found buckled up in yards and the draft gear lying around, having been pulled out due to rough switching. There should be some speed limit in yards to prevent this destruction of equipment. The time lost in switching out bad order cars damaged in yard and taking same to repair track would often offset the time gained by excessive speed that cars are switched together. The cost of repairing these cars must also be considered, and the thousands of dollars of damage done to the contents of cars in yard that are not set off for repairs.

What is the mechanical department doing today to overcome these troubles. 1. They are building steel frame cars to certain specifications with stronger types of draft gear. 2. Applying steel underframe or steel centre sills and steel ends, or otherwise re-inforcing the ends of cars to withstand the heavy shock. 3. Applying different types of steel draft arms to the present wood centre sills in such a manner that it re-inforces the wood centre sills, thus greatly reducing the cost of strengthening up the draft gear. 4. Applying heavier types of couplers and draft gear, and using friction draft gear, for in the past very little attention has been paid to what type of draft gear the cars were equipped with, but the friction type of draft gear is now being used to a large extent.

The demands of modern railroading requires the stopping of a high speed train in about two minutes and the draft gear is expected to absorb the shock. The air brake department can help to eliminate the strain on the draft gear by instructing the engineers as to the proper method of handling long trains. The principle thing is to control the slack to prevent it from running in or out harshly. Slack in draft gear cannot be prevented, as it is due to compression of the springs, and the heavier the locomotive and the longer the train, the greater the care that is required. Engineers are instructed in the air brake instruction car how this should be done, but the general air brake inspector should see to it that the rules are followed out in actual service.

The vital question today before the car department is how to keep these wooden underframe cars in service. The majority of the railways are destroying the 40,000 lb. cars, but the 60,000 lb. and 80,0000 lb. cars that were built with wooden underframe and short draft timbers are not any stronger and cannot withstand the heavy service and severe yard conditions of to-day, and unless the operating department will assist in reducing the damage done to cars and thus reduce freight car repairs, and also keep the cars in service by marshalling this class of car on the rear end of the train, and exercising greater care in switching cars in yard, the cost of freight car repairs will increase and the repair tracks will be full of bad order cars. The only other remedy is to spend money to apply steel centre sills or steel draft arms, so arranged as to strengthen the present wood centre sills, and in addition to this re-inforce the end of this class of cars. But yet the strongest car built cannot withstand the severe usage received in yard switching operations of today unless more care is exercised on the part of the yard crews.

The foregoing paper was read before the Canadian Railway Club recently.

Railways in Saskatchewan.—The annual report of the Saskatchewan Department of Railways shows that that Province leads all Canada in railway construction. In 1913 the new mileage built was 424 miles in excess of the next nearest Province; and since 1905, the mileage has been practically quadrupled. That there is still abundant room for railway development is shown by the following paragraph of the report:—"The question of railway development in our Province, despite the progress already made, remains one of paramount importance. The rapid development of the country impresses a realization of the need of railways. There are many rich and fruitful districts being retarded and vast regions remaining unopened and unproductive awaiting railway facilities."

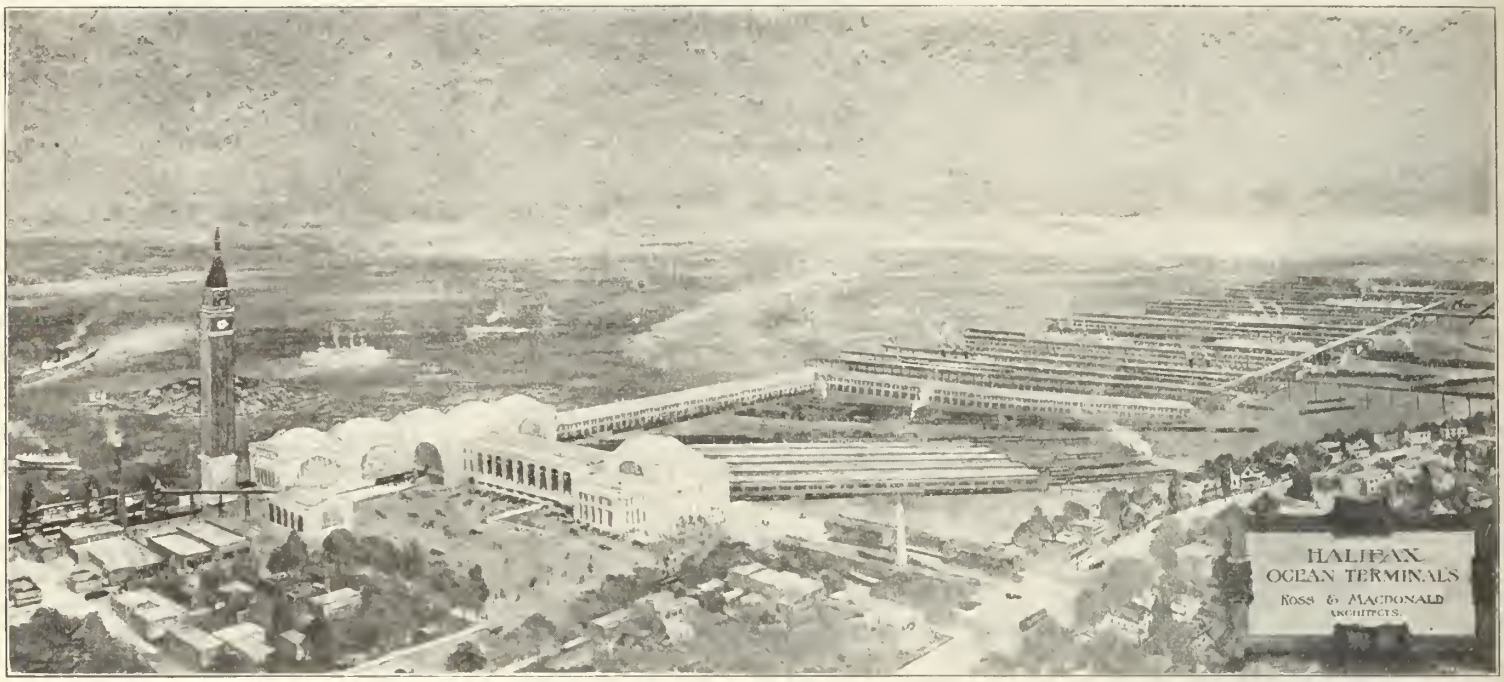
The C.P.R. Offices in St. John, N.B., have been removed from the Bank of Montreal Building, where they have been located for many years, to the corner of King and Germain Streets, where the company bought a building some time ago, and has remodelled it into a modern five story structure. The ground floor is occupied by ticket and telegraph offices and the Dominion Express Co. On the first floor are the general divisional offices of the freight and passenger departments. The second floor is occupied by the General Superintendent of the Atlantic Division and staff, the third floor by the engineering department, and the fourth floor by the telegraph staff.

Dining Car Service at Valcartier.—During the operation of the military concentration camp at Valcartier, Que., prior to the departure of the Canadian overseas contingent, the Canadian Northern Ry. operated a dining car at its station there, in which meals were served to a large number of camp visitors. A luncheon counter was also operated in a commissary car.

The C.P.R. has offered a free scholarship covering four years' tuition in the Faculty of Applied Science, McGill University, Montreal, to apprentices and others on the Company's permanent staff and under 21 years of age, and to minor sons of employes. The examination, which is the regular entrance one, will be held in June, 1915.

Halifax Ocean Terminals, Intercolonial Railway.

General preliminary plans in connection with the buildings for the new ocean terminals at Halifax have been submitted by the architects, Ross & Macdonald, Montreal, to the Minister of Railways through F. P. Gutelius, General Manager, Canadian Government Railways. These plans illustrate the general arrangement for the handling of passengers and freight and the facilities provided for the transferring of passengers, baggage, mail and express to and from railway trains and steamships, as well as for the provisions for the handling of local Halifax city traffic.



Complete Scheme for Halifax Ocean Terminals, looking towards the Harbor.

The general scheme consists of a passenger station building in the shape of a large letter T, the foot of the T being at the shore end, and the head of the T at the steamship landing stage. The shore end of the building will provide accommodations for the local Halifax traffic and will contain ticket offices, baggage and parcel checking rooms, restaurant and lunch room, women's and men's retiring rooms with lavatories, and provision on the upper floors of the building for the office space required by the railway and steamship lines. This portion of the building, which will be known as the Halifax city station, will face on a plaza located between South and Tobin Sts., this plaza extending from Pleasant St. east to the front of the station building, and being about 400 ft. deep. A space for cabs will be provided on the north, with access to baggage checking room and to ticket lobby. Passengers on entering the building will find all the facilities they require for transacting their business, after which they may pass on to the train concourse or train waiting room.

The general plan provides a landing stage approximately 2,000 ft. long, which will be divided into two parts, the northerly third for the active handling of passengers, baggage, mail and express, and the remainder for the handling of cargo. It is upon this northerly end of the landing stage that the top portion of the T shaped building is placed.

Complete Scheme for Halifax Ocean Terminals, looking from the Harbor.

Passengers disembarking from steamships will enter the building at the second story level. Passengers' baggage will be discharged at the same level and will be distributed in the usual way for customs ex-

aminations. After baggage has been passed by the customs officers and then checked by the railway staff, it will be transferred to the floor below, by means of chutes or elevators, to a distributing baggage room, from where it will be routed to cars according to destination. Mails will be discharged directly from the steamship to the lower level of the steamship passenger building, to a distributing mail room, from where they will be transferred to cars according to destination. After passengers have landed, and have passed their baggage through the customs, they will pass into a booking hall containing ticket offices for the railway and steamship lines. Here passengers may obtain railway checks for their baggage, secure their tickets and attend to other matters of transportation which they may find necessary. They will then pass into the train concourse or train waiting room, which will connect the steamship station with the Halifax city station and form the stem of the letter T as stated above. The train concourse is designed for the common use of the Halifax city traffic and the steamship passenger traffic. The floor of this room will be placed level with the second story level of the steamship passenger building, and also level with the ticket lobby floor of the Halifax city station. The passenger platforms of the trainshed will be placed at a level between the train concourse and the baggage room beneath. All stairways will be eliminated between the train concourse level and the passenger platforms, the passengers reaching the passenger platforms by means of easy inclines. Separate trucking platforms for baggage trucks will be provided and these will connect with the baggage room beneath the train concourse by similar inclines, but separate from the passenger inclines, thus avoiding all confusion between passengers and baggage.

Ample provision will be made for the large number of immigrants which are expected to come through the port of Halifax and detention rooms and offices will be provided for the various government officials connected with the immigration work, as well as separate lounge rooms, lunch rooms, sleeping rooms, lavatories, etc., for the immigrants. These rooms will not be directly connected with the other portions of the station building.

The general arrangements contemplate the erection of a separate power house for the furnishing of heat, light and power for all the buildings connected with the terminal project, a grain elevator for the handling of grain from cars to the vessels, and large track provisions for handling of freight to and from the pier sheds. The architects are preparing plans for all the work in connection with the buildings to be placed upon the piers. The use of local materials is contemplated as far as possible and practicable, including granite, sandstone, brick and concrete.

A contract for the construction of the sea walls of the landing stage and the first pier was let some time ago to Foley Bros., Welsh, Stewart and Fauquier, and the work is in progress.

Increased Rates for Spirituous Liquors Refused.—The Canada and Gulf Terminal Ry. applied recently, to the Quebec Public Utilities Commission, for permission to use a special tariff on spirituous liquors, in excess of the general tariff, giving as a reason therefor the frequent pilfering of liquor consignments. After hearing evidence, the commission decided that nothing had been advanced that would justify the increase asked for, and that if there is breaking into and interference with consignments the remedy for this state of affairs is not by an increase of the rates charged.

Railway Finance, Meetings, Etc.

Algoma Central and Hudson Bay Ry.—There has been deposited with the Secretary of State at Ottawa a deed made between the company and the United States Mortgage and Trust Co., securing an issue of second mortgage 6% gold bonds redeemable in 50 years.

Canadian Pacific Ry.—Application is being made to the Board of Railway Commissioners by the C.P.R. for recommendation to the Governor-in-Council for approval of the leasing to it of the Lake Erie and Northern Ry. for 999 years, from Dec. 1.

Central Vermont Ry.—The report for the year ended June 30, which was presented at the annual meeting at St. Albans, Vt., Oct. 20, showed an operating loss of approximately $259,257.75, which has been paid by the G.T.R. under its guarantee. The officers and directors for the current year are,—Chairman, E. J. Chamberlin; President, E. C. Smith; Vice President, C. W. Witters; other directors, E. A. Chittenden. G. C. Jones, W. S. Webb, J. W. Stewart, J. G. McCullough, S. E. Kilner, A. Tuttle, H. S. Marston and W. H. Biggar. Auditor, E. Deschenes; Clerk and Treasurer, W. H. Chaffee.

Kettle Valley Lines.—There was filed with the Secretary of State at Ottawa, Oct. 9, a discharge of a mortgage entered into between the K.V. Ry., the C.P.R. and the Royal Trust Co., dated June 2, 1913, and a mortgage made between the same companies, dated Oct. 8, securing an issue of K.V. Ry. bonds.

Quebec, Montreal and Southern Ry.—An action for the recovery from the Dominion Government of $36,765.45, part of a subsidy claimed to be due on account of the construction of one of the lines now amalgamated under this title, was heard at the Court of Exchequer, Oct. 7, when judgment was reserved. The Q. M. and S. Ry. petitions the court for the necessary order as assigners of the rights acquired by F. L. Beique, when the railways were sold Sept. 2, 1905, under an order of the Court of Exchequer. The Dominion Government alleges that the amount claimed is not due, as the balance of the subsidy was retained by the Government as being owing to the Intercolonial Ry. for freight charges.

Temiscouata Ry.—We are officially advised that the report for the year ended June 30, 1914, submitted at the annual general meeting of shareholders and registered bondholders at Quebec, Sept. 29, was considered very satisfactory. Passenger traffic showed an increase of $1,400 and freight traffic an increase of $20,000. After meeting all fixed charges a dividend on the consolidated mortgage income bond was declared similar to last year, $10,000 was appropriated for betterments, and $4,800 was carried forward. The following are the directors for the current year: J. H. Walsh, President; G. G. Grundy, Secretary and General Manager; A. H. Cook, K.C., F. Murphy, K.C., and W. N. Campbell.

Net earnings for August $3,667.

Wabash Rd.—Plans for the reorganization of the company, which were submitted to the State Commission in May, have been withdrawn by the bondholders' committee. It is stated that the plans have been interfered with by the war, by legislation and excessive taxation.

White Pass and Yukon Route.—Gross earnings from Jan. 1 to Sept. 14, $1,347,782, against $1,091,835 for the same period 1913.

Canadian Government Railways officers and employes have given one day's pay to the Canadian Patriotic Fund, $20,150.

Great Northern Railway's Report for 1913-14.

The G. N. Ry.'s 25th annual report covers the operations for the year ended June 30. It shows that the share capital has been increased from $231,000,000 to $250,000,000, of which there was outstanding $230,997,700. The bonded debt outstanding has been increased from $185,830,909.09 to $193,124,909.09. There was an increase of $7,471,000 of bonds held in the treasury, $3,000,000 of which have been issued on account of construction, and the remainder for the acquisition of stock on various subsidiary companies, the following being in Canada:—Vancouver, Victoria and Eastern Ry. and Navigation Co., $1,800,000; Crow's Nest Southern Ry., $30,000; Nelson and Fort Sheppard Ry., $30,000; Manitoba Great Northern Ry., $25,000.

The expenditure on new construction was $2,618,979.94, and included $256,378.56 on account of the extension from Niobe, N.D., to the International boundary at Northgate, Sask., where connection is made with the Grand Trunk Pacific Ry. branch from Regina; and $433,047.84 on account of the Oroville-Pateros branch of the section of the V. V. and E. Ry. in Washington. The total net increase in the investments in Canadian companies is $1,583,994.35. The report refers to the arrangements made with the Kettle Valley Lines for the joint use of certain sections by the V. V. and E. Ry., by which the duplication of 92 miles of line through a difficult country is avoided.

Operating revenues were $75,473,869.09, a decrease of $3,218,898.13, from the previous year. The operating expenses were $46,547,956.35, an increase of $688,701.83. Adding the other revenues, and deducting accrued taxes, bond interest and other charges, the net corporate income was $20,453,551.38. Dividends absorbed $15,063,048, and accrued interest and special appropriations $2,078,934.40, leaving $3,311,571.98 for transfer to profit and loss account. No separate reports are given as to the operations of the lines in Canada.

In the consolidated general balance sheet the total investments shown in the company's Canadian lines are as follows:—Midland Ry. of Manitoba, $2,272,570.13; Manitoba Great Northern Ry., $2,066,000; Brandon, Saskatchewan and Hudson Bay Ry., $2,150,000; Crow's Nest Southern Ry., $4,210,197.42; Bedlington and Nelson Ry., $190,000; Nelson and Fort Sheppard Ry., $2,119,019.51; Red Mountain Ry., $310,619.07; Vancouver, Victoria and Eastern Ry. and Navigation Co., $20,930,000; New Westminster Southern Ry., $278,232.81.

The company owns 7,528.18 miles of first track, and 216.11 of second track. Of this mileage 167.62 of first track are in Manitoba; and 411.27 of first track and 7.12 miles of second track are in British Columbia. Of the mileage in Manitoba, 6.40 miles of main line track are owned jointly with the Northern Pacific Ry.

Funds for Alberta Railway Construction. It is reported to have been announced in the Alberta Legislature, Oct. 20, that there is in the Provincial Government's custody over $12,000,000, received from guaranteed railway securities and not paid out. The amount in connection with each railway is as follows: Canadian Northern, $1,148,959; Canadian Northwestern, $2,759,652; G. T. P. Branch Lines, $1; Edmonton, Dunvegan and British Columbia, $1,935,169; Alberta and Great Waterways, $605,555; Lacombe & Blind Man Valley Electric, $140,035. Total, $12,079,371.

Mainly About Transportation People.

C. R. HOSMER, Director, C.P.R., has been re-elected President, Ogilvie Milling Co., for the current year.

Hon. Donald Howard, grandson of the late LORD STRATHCONA, has been appointed a Lieutenant in Third King's Own Hussars.

Col. J. F. Sweeny, who died at Westmount, Que., Oct. 11, aged 81, was father of H. W. SWEENY, Local Treasurer, C.P.R., Winnipeg.

SIR THOMAS SHAUGHNESSY was amongst the senders of messages of congratulation to John Redmond, M.P., on the passage of the Home Rule Bill.

JAMES THOM, Manager, White Star-Dominion Line, Montreal, and Mrs. Thom, were in London, Eng., in October, having arrived there from North Wales.

JOHN CARDELL, who died at Calgary, Alta., Oct. 5, was at one time a master mechanic on the Western Lines, C.P.R. He retired from active service about 10 years ago.

GEORGE BURY, Vice President C.P.R., Winnipeg, was in Montreal early in October for a conference with the President and visited Ottawa and Toronto on his return trip.

R. W. LEONARD, M.Can.Soc.C.E., ex-Chairman National Transcontinental Ry. Commission, has given $5,000 to the Canadian Red Cross Society to buy a motor ambulance for the war.

J. S. DENNIS, Assistant to the President in charge of the Natural Resources Department, C.P.R., Calgary, Alta., has been elected First Vice President of the International Irrigation Association.

G. E. SMART, Master Car Builder Canadian Government Railway, Moncton, N.B., read a paper on wooden frame cars in freight trains before the Canadian Railway Club in Montreal, Oct. 12.

F. W. BERGMAN, formerly Manager-in-Chief of Hotels, Grand Trunk Ry. and Grand Trunk Pacific Ry., has been appointed Manager of the new Hotel Statler, Detroit, Mich., which will open in January.

Lieut. R. F. MORKILL, Signal Engineer, G.T.R., Montreal, who is attached to the Engineers' Corps, was among those who sailed with the Canadian contingent recently for active service in Europe.

C. E. JENNEY, General Agent, Passenger Department, G.T.R. and G.T. Pacific Ry., Vancouver, B.C., has been elected chairman of the executive of the Ocean Steamship Agents' Association of Vancouver.

A. EWAN MOORE, Manager Land Department, C.P.R., London, Eng., was expected in Canada towards the end of October. His marriage with Miss K. Barnard, Vancouver, B.C., is announced for Nov. 14.

FREDERICK NICHOLLS, President, Canadian General Electric Co., Toronto; Vice President Toronto Railway, and director Canadian Northern Ry., has been appointed an honorary colonel of the Canadian Militia.

J. K. L. ROSS, the newly elected C. P. R. director, is the youngest member of the Board. His father, the late Jas. Ross, was not a director but was generally reputed to have been the largest individual shareholder.

C. TRITES, secretary to C. A. Hayes, General Traffic Manager, Canadian Government Railways, Moncton, N.B., was presented, Sept. 29, with a chime clock by the departmental staff on the occasion of his marriage.

SIR THOMAS SHAUGHNESSY is President of the King Edward Memorial Fund Committee, which erected a statue of the late King in Montreal recently, and which was unveiled by the Governor General, Oct. 1.

W. E. MULLINS, General Manager, Costa Rica Division, United Fruit Co., San Jose, and formerly of the G.T.R., was a passenger by the company's s.s. Matapan, which sank in New York harbor after colliding with the s.s. Iowan recently.

A. T. WELDON, who has resigned as Manager, Black Diamond Steamship Co., Montreal, on his appointment as Assistant General Freight Agent, Intercolonial Ry., Moncton, N.B., was presented with a club bag by his staff recently.

Lieut. C. L. CANTLEY, Assistant General Manager, Nova Scotia Steel and Coal Co., New Glasgow, N.S., is a member of the Canadian contingent, attached to the 13th Battalion, 5th Royal Scots, which sailed recently for foreign service.

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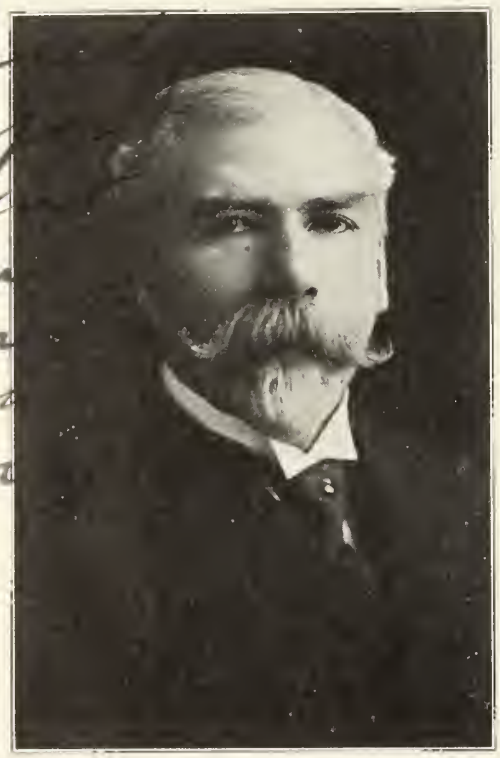


P400 T. J. Kennedy,
President and General Manager, Algoma Central and Hudson Bay Railway and Algoma Eastern Railway.

Major J. E. Mills, only son of JAMES MILLS, one of the members of the Board of Railway Commissioners, has gone on active service with the R.C.H.A. He has been instructor in gunnery tactics at Quebec, Kingston and Esquimalt.

A. E. VOYSEY, chief assistant to the European Manager, C.P.R., London, Eng., was presented with a side table and plate cabinet, with bronzes and an illuminated address by the European staffs recently, on the occasion of his marriage.

LORD FURNESS has been elected Chairman of Furness, Withy and Co., vice Sir Stephen Furness deceased, and F. W. Lewis, one of the Managing Directors has been elected Deputy Chairman. Lord Furness is a son of the late Lord Furness, the founder of the company.

A. T. FOLGER, whose resignation of the position of Manager, Chateau Laurier Hotel, G.T.R., Ottawa, was announced in our last issue, and who, it was mentioned, would be associated with the management of the Olympia Hotel, Winnipeg, has been appointed Manager of that hotel.

"F. H. CLERGUE, the great financier and promoter, who took a course of extension lectures at McGill University, in the interval between his last enterprise and his present undertaking of the North Railway, is described by Professor Leacock as the finest student he ever had."—Financial Times.

Among Belgian refugees who arrived in England recently, after the evacuation of Antwerp by the allies, were a number of members of the C.P.R. staff there, who came by way of Holland. W. D. GROSSET and other members of the staff left Antwerp a few weeks ago, and have since been in England.

H. L. DRAYTON, K.C., Chief Railway Commissioner, returned to Canada from England, Oct. 8. He was in England at the outbreak of the war, and immediately offered his services to the acting High Commissioner in connection with the rendering of assistance to stranded Canadians in various parts of Europe.

T. BARCLAY ROBINSON, who died at St. John, N.B., Oct. 15, aged 76, was at one time Secretary Treasurer of the old European and North American Ry., and later occupied a similar position with St. John Bridge and Ry. Extension Co., which built and for some time owned the cantilever bridge and the line between St. John and Fairville.

JAMES BICKNELL, K. C., who died at Toronto, Oct. 22, acted as counsel on behalf of the Dominion Government in the western freight rates case which was heard before the Board of Railway Commissioners last year. As a member of the then firm of Laidlaw, Kappelle and Bicknell, a few years ago, he acted as a solicitor for the Toronto Ry.

H. L. PENNY, General Auditor, C.P.R., Montreal, was presented with a gold watch, chain and locket, by the Audit Department staff, Oct. 3, on his leaving the service for reasons of health. He entered C.P.R. service at Winnipeg in 1881 and worked in various capacities, chiefly in the Auditing Department, and is now returning to the west, where he will live for the future.

M. O. DAFOE, who has been appointed City Passenger and Ticket Agent, G. T. R., Montreal, entered railway service in 1885, and was to 1906, successively, switchman, agent, and freight accountant, jointly for the G. T. R. and Intercolonial Ry., at Quebec. Since 1906 he has been Travelling Passenger Agent, G. T. R., at Montreal, and for the past few months acting C. P. & T. A.

W. H. CLANCY, City Passenger and Ticket Agent, G. T. R., Montreal, has retired after 40 years of continuous service with the company. He entered the service in 1874 as a clerk, and was subsequently engaged as ticket examiner at Cobourg, Stratford and Toronto. In 1884 he joined the city passenger office staff at Montreal, and occupied the position of City Passenger and Ticket Agent from 1897 to his retirement.

J. F. PIERCE, Assistant General Passenger Agent, Canada Steamship Lines, Ltd., has been elected a member of the Eastern Canadian Passenger Agents Association's executive committee, vice H. FOSTER CHAFFEE, resigned, owing to retirement from Canada Steamship Lines service on account of ill health. The association accepted Mr. Chaffee's resignation with regret and expressed the hope that he will soon be restored to his usual good health and place in the association's counsels.

HUGH PATON, President Shedden Forwarding Co., Ltd., who celebrated his 62nd birthday recently, continues to exhibit his love for horses. He is one of the few Montreal business men who continues the old

habit of driving to the office instead of motoring. The motor car has little attraction for him, when compared with the delight which so true a lover of horses finds in handling the reins.—Financial Times.

ALBERT WEBB, who has been appointed Assistant Contract Foreman, Montreal, entered C. P. R. service Oct. 4, 1906, and worked in various capacities in the Car Department at Farnham, Que., until Oct. 1911, when he was transferred to Hochelaga, Que., as chief clerk, which position he held until Apr. 1, 1914, when he was appointed Shop Car Inspector there. On June 1, 1914 he was appointed Assistant Contract Foreman at Hochelaga, and transferred in a similar capacity to Ottawa, Sept. 22.

G. W. COBURN, whose appointment as Resident Engineer, Brandon, Man., was announced in a recent issue, entered C. P. R. service in 1896, as rodman and draughtsman at Farnham, Que. From 1900 to 1902 he was engaged in construction work on various parts of the system, and in 1902 was appointed Assistant Resident Engineer and draughtsman at Souris, Man., and later served in a similar capacity at Moose Jaw, Sask. In 1907 he was appointed Resident Engineer at Souris, Man., which position he held until his transfer to Brandon in July.

JOHN LESLIE, who has been appointed Comptroller, C.P.R., Montreal, was born at Toronto, and entered railway service with the Toronto, Grey and Bruce Ry. as assistant cashier, and was subsequently cashier, accountant and auditor, successively. On the absorption of the railway by the C.P.R. in 1893, he was placed in charge of the accounts of the Ontario lines at Toronto until March, 1895, and until 1897 was at Montreal. From 1897 to Oct. 2, 1899, he was chief clerk to Auditor; Oct. 2, 1899, to Dec. 1, 1908, Auditor of Disbursements; Dec. 1, 1908, to Oct. 1, 1914, Assistant Comptroller.

ROBERT FULTON CHAPMAN, whose appointment as Chief Dispatcher, District 1, Saskatchewan Division, C.P.R., Regina, was announced in our last issue, was born at Coal Branch, N.B., Jan. 21, 1874, and entered C.P.R. service May 26, 1889, since when he has been, to Sept., 1894, commercial telegraph operator, Winnipeg; Sept., 1894, to Mar., 1901, operator at various points on the Western Lines; Mar., 1901, to Mar., 1907, dispatcher at various points, Western Lines; Mar., 1907, to June, 1909, Chief Dispatcher, Moose Jaw, Sask.; June, 1909, to Sept. 17, 1914, Chief Dispatcher, Saskatoon, Sask.

B. A. NEISSER, who has retired from the position of Freight Claims Auditor, G.T.R., Montreal, entered railway service with the Michigan Central Rd., in the local freight department, Battle Creek, Mich., in 1868, since when he has been connected with G.T.R. subsidiary lines, as chief clerk, claims division, Treasury Department, at Port Huron and Detroit, Mich. On the amalgamation of the G.T.R. subsidiary lines, with headquarters at Montreal, in 1896, he was appointed chief clerk to the Freight Claims Agent, and in April, 1908, was appointed Freight Claims Auditor, from which position he retired, Sept. 30.

GARRETT VLIET, Master Mechanic, Western Division, G.T.R., Battle Creek, Mich., who died at Kansas City, Oct. 5, was born at Milwaukee, Wisc., in 1856, and entered railway service in 1877, since when he has been, to 1879, draughtsman, St. Louis and San Francisco Rd., Kansas City, Mo.; 1879 to 1889, draughtsman, Wabash Rd.; 1889 to July, 1898, General Foreman, Wabash Rd.; Oct., 1898, to Apr., 1899, General Foreman, G.T.R., Battle Creek, Mich.; Apr., 1899, to Oct., 1910, Assistant Master Mechanic, G.T.R., District 1, Portland, Me. He was appointed Master Mechanic, Western Division, G.T.R., at Battle Creek, Mich., in Oct., 1910, and held that position up to the time of his death.

G. A. HOAG, who was recently appointed Superintendent of Car Service, Eastern Lines, Canadian Northern Ry., Toronto, was born May 31, 1866, and educated at the Kingston public schools and business college. He entered railway service June 8, 1884, as switchman, G. T. R., and served at various points until May 3, 1886, when he was appointed night operator, and promoted to day operator and relieving agent, Jan. 1888. From 1899 to 1901 he was agent, same road, Trenton, Ont.; 1901 to 1905, Yardmaster, same road, Belleville, Ont.; Oct. 1905 to Mar. 1908, Trainmaster, Central Ontario Ry., Trenton, Ont.; Mar. 1, 1908 to July 1914, Superintendent, same road, Trenton, Ont.

W. H. SAMPLE, who has been appointed Master Mechanic, Western Division, G.T.R., Battle Creek, Mich., was born at Altona, N.Y., Aug. 20, 1864, and entered railway service July 20, 1882, since when he has been, to Apr., 1886, fireman, Central Vermont Ry.; Apr., 1886, to July, 1887, locomotive driver,

P187 W. P. Hinton,
Assistant Passenger Traffic Manager, Grand Trunk Railway and Grand Trunk Pacific Railway.

C.V.R.; July, 1887, to Aug., 1889, locomotive driver, Atchison, Topeka and Santa Fe Ry.; Aug., 1889, to Feb., 1901, locomotive driver, Central Vermont Ry.; Feb., 1901, to July, 1906, Road Foreman of Locomotives, C.V.R.; July, 1906, to Mar. 15, 1911, Superintendent of Motive Power and Car Department, Northern Ry. of Costa Rica; Mar. 15, 1911, to Oct., 1914, Master Mechanic, Ottawa Division, Eastern Lines, G.T.R., Ottawa, Ont.

W. H. BIGGAR, K.C., who has been appointed Vice President and General Counsel, G.T. Pacific Ry., Montreal, was born at the Carrying Place, near Trenton, Ont., Sept. 19, 1852, and was educated at the Trenton Grammar School and Upper Canada College. He began the study of law in 1875, after having engaged for a short time in commercial pursuits, and was called to the bar in 1880. He then became associated with John Bell, Q.C., then General Counsel, G.T.R., in general practice in 1881, and was appointed Assistant General Counsel, G.T.R., Montreal, Jan., 1903, and General Solicitor, Dec., 1904, and General Counsel, G.T.R. and G.T.P.R., Montreal, in Jan., 1910. He was Mayor of Belleville, Ont., in 1887, and represented West Hastings in the Ontario Legislature from 1890 to 1897. He was made a Q.C. in 1900.

A. T. WELDON, who has been appointed Assistant General Freight Agent, Canadian Government Railways, Moncton, N.B., was born at Dorchester, N.B., Mar. 6, 1876, and entered transportation service in 1890, since when he has been, to April, 1900, in different capacities in the Freight Department, Intercolonial Ry.; Dec., 1901, to Aug., 1904, in Division Freight Agent's office, I.R.C., Halifax, N.S.; Aug., 1904, to May 1, 1907, Secretary, Halifax Board of Trade; May 1 to Nov. 18, 1907, General Sales Agent, Port Hood Richmond Ry. Coal Co., Halifax, N.S.; Nov. 18, 1907, to 1909, Division Freight Agent, I.R.C., Halifax, N.S.; 1909 to Oct. 1, 1914, General Freight and Passenger Agent, Black Diamond Steamship Co., Montreal.

T. McHATTIE, who has been appointed Master Mechanic, Eastern Lines, G. T. R., Montreal, and whose portrait appears in this issue, was born at Dufftown, Banffshire, Scotland, Aug. 8, 1854, and entered railway service in Oct. 1870, since when he has been, to 1878, in locomotive shops, Great Western Ry., Hamilton, Ont.; June 1878 to Aug. 1886, locomotive driver, same road; Aug. 1886 to Apr. 1889, Locomotive Foreman, G. T. R., Palmerston, Ont.; Apr. 1889 to Apr. 1898, General Foreman in charge of locomotives, same road, London, Ont.; Apr. 1898 to Jan. 1909, Master Mechanic, Eastern Division, same road, Montreal; Jan. 1909 to Apr. 1912, Superintendent of Motive Power and Car Department, Central Vermont Ry., St. Albans, Vt.; Apr. 1912 to Oct. 1914, Master Mechanic, Eastern Division, G. T. R., Montreal.

WILLIAM PERCY WILGAR, who has been appointed Professor of Civil Engineering, Queen's University, Kingston, Ont., was born at Cobourg, Ont., Mar. 9, 1878, and entered railway engineering service in 1899, after which he was, during summer vacations, in 1899, chain man, G.T.R., Cobourg, Ont.; 1901, transit man, Kingston and Pembroke Ry., Kingston, Ont.; 1902, locating engineer, Bay of Quinte Ry., Deseronto, Ont.; 1903, Resident Engineer, Bay of Quinte Ry., Tweed, Ont.; 1903 to 1904, locating engineer, Central Ontario Ry., Trenton, Ont.; 1904 to 1905, in charge of a party of exploration, District C, National Transcontinental Ry.; 1905 to 1906, locating engineer, District C, N.T.R.; 1906 to 1908, locating engineer, District E, N.T.R.; 1908 to 1911, Division Engineer, District E, N.T.R.; 1911 to 1914, Assistant District Engineer, Districts C, D and E, N.T.R.

W. P. HINTON, who has been appointed Assistant Passenger Traffic Manager, G.T.R. and G.T.P.R., Montreal, and whose portrait appears in this issue, was born at Hintonburg, Ont., Aug. 30, 1871, and entered railway service in May, 1887, since when he has been, to Aug., 1891, clerk, freight, passenger and car accounts, and travelling auditor, Canada Atlantic Ry.; Aug., 1891, to Mar., 1898, rate clerk, General Freight and Passenger Department, same road, and accountant Canada Atlantic Fast Freight Line; Mar., 1898, to June 30, 1901, Assistant General Freight Agent, same road, and Canada Atlantic Transit Co.; June 30, 1901, to Jan. 30, 1903, General Freight Agent, same road; Jan. 30, 1903, to Oct., 1905, General Passenger and Freight Agent, same road; Oct., 1905, to Jan., 1907, General Agent, Passenger Department, G.T.R., Ottawa; Jan., 1907, to Apr., 1909, Assistant General Passenger and Ticket Agent, same road, Montreal; Apr., 1909, to Feb., 1914, General Passenger Agent, G.T. Pacific Ry., Winnipeg; Feb. to Oct. 1, 1914, Assistant Passenger Traffic

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—Application is being made to the Alberta Legislature for authority to build a branch line starting from Lac La Biche, on the line now under construction from near Edmonton, southeasterly to the eastern boundary of the province.

R. H. Douglas, Provincial Engineer of Railways, returned to Edmonton recently from an inspection of the work on the line. He is reported to have said that the end of steel was at the Redwater River, 28 miles from the starting point at the Edmonton, Dunvegan and British Columbia Ry. At Redwater River a 58 ft. trestle bridge was under construction, which it was expected to have completed by the middle of October. Grading had been completed from that point through to Skeleton Lake, at mileage 76, and was ready for the track layers. Between this lake and Lac La Biche, at mileage 114, a considerable amount of grading had been completed, and three gangs were at work connecting the different sections. A bridge will be built across a ravine at mileage 75, and another over an arm of Egg Lake, mileage 106. It is expected that track laying will be completed to Lac La Biche this year. The location engineers have completed their work to Fort McMurray, and two grading outfits are at work beyond Lac La Biche, working towards Fort McMurray. The distance between these two points is approximately 160 miles. (Oct., pg. 468.)

Algoma Central and Hudson Bay Ry.—The Board of Railway Commissioners has authorized the opening for traffic of the line from Oba to Hearst, Ont., mileage 83 to 130.87. The track was laid on this section at the latter end of 1913, and the ballasting and finishing up was done this year. The line is now in operation from Sault Ste. Marie to Hearst, 295 miles, with a branch to Michipicoten Harbor, 26 miles, and other short mining branches, which brings the total operated to 320 miles. The main line connects with the C.P.R. transcontinental line at Franz, mileage 195 from Sault Ste. Marie, the Canadian Northern Ontario Ry. at Oba, mileage 245, and the Grand Trunk Pacific Ry. at Hearst, mileage 295. (Sept., pg. 418.)

Athabasca and Grande Prairie Ry.—The Dominion Parliament is being asked to extend the time for the construction of this projected railway from the junction of the Salmon and Athabasca Rivers, in Alberta, to Dunvegan and the Grande Prairie country, west of Bear Lake, B.C. Pringle and Guthrie, Ottawa, solicitors for the applicants. (Aug., 1913, pg. 376.)

Burrard Inlet Tunnel and Bridge Co.—It is said that R. Mojeski's report on the designs for the bridge over the second narrows of Burrard Inlet, Vancouver, B.C., has been received and will be studied by the directors prior to the Board's November meeting, when it will come up for action. (Oct., pg. 468.)

Caraquet Ry.—By an act passed last session of the New Brunswick Legislature the Caraquet Ry. is authorized to transfer to the Bathurst Lumber Co. the right of way on which is a Y and sidings between its main line and the Nipisiquit bridge, at Bathurst Harbor. It is also provided that the Caraquet Ry. station and tracks are to be moved to another site, and that the Bathurst Lumber Co. is to erect a wharf with approaches on the harbor frontage. In carrying out this work, or any other work, the Bathurst Lumber Co. must not interfere with the right of way of the Northern New Brunswick and Seaboard Ry. or the Canada Iron Corporation's lands.

Central Canada Ry.—The Alberta Legislature is being asked to authorize the company to build, in addition to the lines already authorized, a line from Sucker Creek, on the Edmonton, Dunvegan and British Columbia Ry., to Grouard, Alberta. Short, Woods, Biggar and Collisson, Edmonton, solicitors for applicants.

The Alberta Legislature has approved of the principle of a bill granting special provisions for financing the building of the main line to Peace River Crossing, and granting a guarantee of bonds for $20,000 a mile for the building of a branch to Grouard. 14 miles.

A press report states that 30 miles of grading have been completed on this line, which starts from McLennan, on the Edmonton, Dunvegan and British Columbia Ry., and it is expected that the grading gangs will reach Peace River Crossing, 20 miles further on by the end of the year. It is also said that track laying will be started as soon as the steel on the E.D. and B.C. Ry. reaches McLennan, and that it is expected to have 30 miles of steel laid by the end of the year. (May, pg. 213.)

Dominion Government Railway to Hudson Bay.—W. A. Bowden, Chief Engineer of the Department of Railways and Canals, completed an inspection of the terminal works in connection with this railway under construction at Port Nelson, Man., recently. He is reported to have stated that the various works are well under way, that satisfactory progress is being made, and that unless anything unforeseen occurs the terminals will be completed by the time track on the railway from Pas reaches Port Nelson. The work on the railway is also being gone on with in a satisfactory manner. (Oct., pg. 468.)

Edmonton, Dunvegan and British Columbia Ry.—A regular train service has been inaugurated from West Edmonton to Sawridge, on the Athabasca River, mileage 135, where connection is made with steamboats running on Lesser Slave Lake. Station buildings have been erected at four points on the line, and a divisional point is being laid out at Smith, mileage 131. In the terminal yards at West Edmonton, a 12-stall locomotive house and other terminal buildings are being erected.

The line skirts the shores of Lesser Slave Lake for about 20 miles out of Sawridge, and again for about 10 miles in the vicinity of Geroux Bay, 50 miles from Sawridge. Track is reported to have been laid to within five miles of this point, and it is expected that the steel will reach Big Smoky River, about mileage 290 from Edmonton by the end of the year. The second divisional point will be laid out at McLennan at about mileage 260. W. B. Smith is Chief Engineer, and W. J. Pace is Superintendent of Construction. (Oct., pg. 468.)

The Alberta Legislature has passed an act providing for a guarantee of bonds for $20,000 a mile for the extension of the line to the western boundary of the province, where it will connect with the Pacific Great Eastern Ry. The original act guaranteed the company's bonds up to $20,000 for 350 miles, and the present act covers the remaining distance to the boundary, 61 miles.

Erie and Ontario Ry.—A special meeting of shareholders has been called for Nov. 11 to pass resolutions approving of an agreement of amalgamation with the Toronto, Hamilton and Buffalo Ry. The shareholders of the T.H. and B. Ry. have been called to meet on the same day for the same purpose. The E. and O. Ry. is to be merged into the T.H. and B. Ry.

Press reports state that the right of way acquired is 75 ft. wide, and that the single track being built is so arranged that if it is found necessary to build a second track it will be the same distance from the centre of the right of way. It is expected that the contract for the station buildings will be let early in November. (Oct., pg. 468.)

Essex Terminal Ry.—The Dominion Parliament is being asked to extend the time for the completion of this railway, and to authorize a change in the date of the annual meeting. (Sept., pg. 418.)

Gananoque and Arnprior Ry.—A proposition to grant a bonus of $25,000 towards the building of this projected railway, from Gananoque to Arnprior and other points in the Ottawa River valley, has been defeated by a vote of the ratepayers of Ketley tp., Ont. (Aug., pg. 370.)

High River and Hudson Bay Ry.—Application is being made to the Alberta Legislature for amendments to chap. 51 of the statutes of 1910, authorizing various changes in the starting points of the several lines authorized to be built. The company is also applying for an extension of time within which to start construction. Ballachey and Mackenzie, High River, Alberta, solicitors for applicants. (July., pg. 323.)

Intercolonial Ry.—It is reported that the track between Moncton and Painsec Jct., N.B., is being relaid with 85 lb. steel.

Tenders are under consideration for the building of a subway under the tracks at Main St., Moncton. This is the beginning of the grade separation work, the agreement to carry out which was approved by the ratepayers Aug. 31. In order to facilitate the work a temporary track is being laid for the Moncton Tramways Electricity and Gas Co.'s electric railway along the street at the subway site. (Oct., pg. 468.)

Kettle Valley Lines.—The Premier of British Columbia gave out for publication, Oct. 6, the following telegram received from J. J. Warren, President, K.V. Ry.:—"We connected up the Kettle River and Okanagan Valley on Friday last, the steel meeting at mile 45 east of Penticton. We now have almost 225 miles of steel laid, of which 175 miles are continuous from Midway to Osprey Lake, via Penticton. Over 90% of the grading of the entire line is completed. All grading will be finished in another month. At the beginning of winter there will remain only 60 miles of track to be laid next year." (Sept., pg. 418.)

Montreal Harbor Commissioners' Railway.—A press report states that Montreal Harbor Boards' engineering department is preparing plans for the electrification of its lines along the harbor front, and that the work will include the elevation of the entire lines. Steam is now used as motive power.

Ottawa-Toronto passenger service. The Canadian Northern Ry., which has been operating one passenger train a day each way between Ottawa and Toronto, has also put on two daily night trains, the westbound one leaving Ottawa at 10.50 p.m., arriving Toronto 7.30 a.m. and the one eastbound leaving Toronto at 11 p.m., arriving Ottawa 7.40 a.m.

Pacific Great Eastern Ry.—It was reported, Oct. 3, that track had been laid to mileage 60 from Squamish, B.C. Arrangements are being made for putting on a train service to Alta Vista, mileage 37.5 from Squamish. The grading is completed to Lillooet, mileage 133; from that point to Clinton, mileage 220, the grading is about 80% completed, and it is expected to have the remaining 20% finished by Nov. 30. Between Clin-

ton and Fort George, about 20% of the grading is reported completed. About 60 miles of location has been completed between Fort George and the British Columbia-Alberta boundary, where a junction is to be effected with the Edmonton, Dunvegan and British Columbia Ry. (Oct., pg. 468.)

Prince Edward Island Ry.—Work is proceeding satisfactorily on the Carleton Point extension, from the Emerald-Cape Traverse Branch, which starts 8.06 miles from Emerald and 3 miles from Cape Traverse, to run to Carleton Point, where a terminal is being built for the New Brunswick-P.E. Island car ferry. The only structure of any importance is one trestle. Standard gauge ties are being laid, as it is the intention to change from 3½ ft. to standard gauge when the car ferry goes into operation. F. P. Tripp, Cape Tormentine, N.B., is in charge of this work and also of the terminals on both sides of the strait. (June., pg. 267.)

St. John and Quebec Ry.—A press report stated recently that it was expected to have the section from Gagetown to Centreville, N.B., completed and ready to be taken over for operation under the agreement with the Intercolonial Ry. by Oct. 31. The line into Fredericton is under construction. In connection with this piece of work some difficulty arose with the crossing of the C.P.R. at Aberdeen St., and an interim injunction was obtained, stopping the work. The matter came before the court for argument subsequent to Oct. 15.

U.S. press reports state that arrangements are being made for the starting of construction of the section of the line from Washburn, Me., to the Quebec boundary, early in 1915.

Temiscouata Railway.—At the annual meeting held recently, $10,000 were appropriated for betterments. We are officially advised that it is possible that during next year the company will commence relaying the track with heavier steel.

Winnipeg.—The Commissioners of the Greater Winnipeg Water District are reported to have let a contract to the Rat Portage Lumber Co., Kenora, Ont., for the delivery of 8,000 ties at Indian Bay, Shoal Lake, Man. (Oct., pg. 468.)

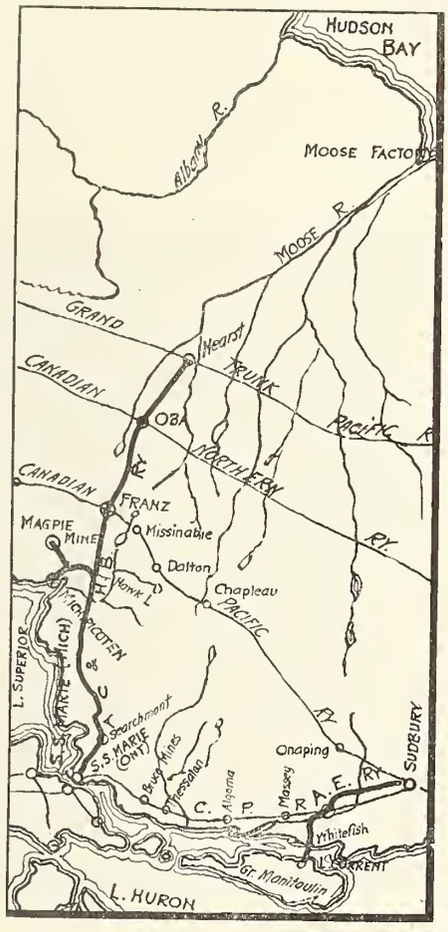
National Transcontinental Railway Construction.

The Minister of Railways returned to Ottawa, Oct. 14, after a trip of inspection over the line from Quebec to Lake Superior Jct., Ont. He is reported to have said that it would be ready for operation Nov 1. With regard to the taking over of the operation of the railway by the G.T.P.R., he said arrangements had not been finally made, and an announcement as to this would be made later.

An Ottawa press dispatch says there will be a limited train service this winter between Moncton, N.B., and Levis, Que., and probably also from Hearst, Ont., eastward. The line is already in operation, under the Intercolonial Ry. management, from Moncton to Escourt, Que., 286.3 miles, so the probability is that the operation to Levis will be under the same management. No intimation has been given as to how the line will be operated eastward from Hearst, Ont., which is the junction point with the Algoma Central and Hudson Bay Ry. (Oct., pg. 469.)

Grand Trunk Pacific Railway Construction.

E. J. Chamberlin, President, returned to Montreal, Oct. 6, after an inspection of the line from Winnipeg to Prince Rupert, and of the branch lines under construction. He is reported to have said in an interview:—"I found our line in British Columbia in much better condition than I expected; in fact, the work done is remarkable, considering that 480 miles were graded and track laid in twelve months through the mountains of British Columbia. We now have a first-class track as far west as Prince George, B. C., and at least half of the track between Prince George and Prince Rupert is fully finished, and the balance of it has a first, and most of it a second, lift of ballast, and compares today very favorably with other railway lines in the northwest. There is a big force at work putting on the finishing touch, and we expect before the close of the season the entire line will be in first class condition. We are now running a through sleeping car train twice a week between Edmonton and Prince Rupert, connecting with the through trains to Winnipeg, and this is being well patronized and giving good service to the people. We are also running freight regularly through to Prince Rupert."



Map showing location of Algoma Central and Hudson Bay Railway and Algoma Eastern Railway.

A press report states that work was started Oct. 9, on the building of a locomotive house, machine shop and other buildings at Fort George, B. C. The contractors are Carter, Hall and Aldinger, Winnipeg, who are also said to have secured the contracts for putting up the terminal buildings at Endako, Smithers and Pacific, B. C.

The Saskatchewan Legislature has extended the time within which the Grand Trunk Pacific Branch Lines Co., and G. T. P. Saskatchewan Ry. may build certain lines in the province, and for the laying out of terminals at Regina, Moose Jaw and other points, for both of which purposes there is a provincial guarantee of bonds. (Oct., pg. 469.)

Completion of the Algoma Central and Hudson Bay Railway.

We are officially advised that this line is fully completed from Sault Ste. Marie, Ont., to Hearst, Ont., the junction with the National Transcontinental Ry., a total distance of 294 miles, which finishes the line as far as the company's present plans go. The Board of Railway Commissioners has issued an order for the operation of the line through to Hearst. A very complete illustrated article on the building of the whole line appeared in Canadian Railway and Marine World for June, 1912, pg. 265, and its terminals at Sault Ste. Marie were described in Feb., 1913, pg. 51.

The line north of the C.P.R. main transcontinental line through to the N.T.R. at Hearst is 99.81 miles long, connecting with the N.T.R., one mile west of the station building. This line is built on 0.6 grade and maximum 6 degree curve, all curves being spiralled with serial spiral. The line is on modern standards in every respect, rock cuttings 20 ft. wide at subgrade, earth cuttings the same, excepting north of Oba in the rolling clay belt, where very light cuttings are common, they have been widened to provide additional drainage.

The line from the C.P.R. at the junction point, Franz, to a point half way to Oba, where it crosses the Canadian Northern Ry. is through the same sort of formation as along the C.P.R. in this district. At this point the line enters the clay belt and the country north of that point presents an entirely different formation, gradually verging from a rocky wilderness into rolling clay ridges and rich spruce low lands, which when drained will make excellent farm land. The line north of Oba has a maximum 3 degree curve, with the one exception where it connects with the N.T.R., which is a 4 degree curve. The maximum grade is the same as the section between Franz and Oba, namely, 0.6.

The Algoma Eastern Ry. is fully completed from Sudbury to Little Current, Ont., including the construction of a draw bridge over the channel at Little Current, together with terminal facilities on Goat Island, which lies just across this channel. This line is built to modern standards, but on heavier grades and curvature than the Algoma Central. They are 1.25 compensated and a maximum 11 degree curve. This line was opened for traffic about a year ago, the first train running through to Little Current, Oct. 1, 1913. The company has been busy since then on terminal work, which is now fully completed, and there is at this point, as at Sault Ste. Marie, a modern coal unloading plant, capable of handling coal from a vessel lying alongside the dock and depositing same in storage pile immediately adjacent at the rate of 200 tons an hour, including the cleaning up of the boat. The plant at Little Current is not as yet giving as good service as the one at Sault Ste. Marie. Both are on same design, but the one at Little Current is operated by steam, while the one at Sault Ste. Marie has electric power. The company is somewhat handicapped also at Little Current by the very bad channel approaching the dock from the east. Several boats have been aground in this channel, and it is quite apparent that it will be necessary to do some extensive dredging work to deepen it so that modern draught coal boats can get through. The government is doing considerable dredging work in the immediate vicinity of Little Current, and it is hoped the work will be extended east to take care of the condition noted. In connection with the coal dock at Little Current the company also has a commercial dock, and at both considerable dredging

has been done. Illustrated articles on the building of the Algoma Eastern Ry. and its terminals were published in Canadian Railway and Marine World as follows:—June, 1912, pg. 267; Oct., 1913, pg. 497.

The whole of the construction of both lines has been in charge of R. S. McCormick, Chief Engineer, to whom we are indebted for the information, above and in the several other articles referred to.

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Algoma Central and Hudson Bay Ry., Algoma Eastern Ry.—T. J. KENNEDY, heretofore President, Superior Construction Co., Sault Ste. Marie, Ont., and formerly General Superintendent, A.C. & H.B. Ry., has been appointed President and General Manager, A. C. & H. B. R. and A. E. R. J. Frater Taylor, heretofore President, and W. C. Franz, heretofore Vice President and General Manager, are President and Vice President, respectively, of the Lake Superior Corporation, the parent company. Office, Sault Ste. Marie, Ont.

Black Diamond Steamship Line.—A. T. Weldon, General Freight and Passenger Agent, Montreal, having resigned to enter Canadian Government Railways service, all communications and reports previously made to him are now addressed to A. McKENZIE, Superintendent, Montreal.

Board of Railway Commissioners.—Hon. W. B. NANTEL, heretofore Minister of Inland Revenue, has been appointed Deputy Chief Commissioner, Board of Railway Commissioners, vice Hon. M. E. Bernier, whose ten year term expired some time since.

Canadian Government Railways.—A press report early in October stated that it had been decided to transfer the purchasing department from Ottawa to Moncton, N. B. On Oct. 16, we were officially advised that no decision had been reached on the matter. It would appear that the transfer is still under consideration.

A. T. WELDON, heretofore General Freight and Passenger Agent, Black Diamond Steamship Co., Montreal, has been appointed Assistant General Freight Agent, Canadian Government Railways. Office, Moncton, N. B. R. E. Perry is also Assistant General Freight Agent, there now being two, both located at Moncton, N. B.

R. W. SIMPSON, heretofore General Fuel Agent, has been appointed General Fuel and Tie Agent, the position General Tie and Timber Agent heretofore occupied by R. A. Klock, having been abolished. Office, Moncton, N. B.

Canadian Northern Ry.—G. A. HOAG, formerly Superintendent Central Ontario Ry., Trenton, has been appointed Superintendent of Car Service, Eastern Lines. Office, Toronto.

A. M. YUILL, heretofore Material Agent, Quebec, has been appointed Tie and Timber Agent, with jurisdiction over Eastern Lines, reporting to the Assistant to the President. Office, Toronto.

L. C. THOMPSON, heretofore Division Storekeeper, Ontario Grand Division, has been appointed General Storekeeper, with jurisdiction over Eastern Lines, reporting to the Assistant to the President. Office, Toronto.

N. P. TRACY, Division Storekeeper, Quebec Grand Division, at Limoilou, Que., now reports to the General Storekeeper, Eastern Lines, Toronto, instead of to the General Superintendent at Montreal, as heretofore.

E. D. TOY, heretofore Storekeeper, Toronto, has been appointed Division Storekeeper, Ontario Grand Division, reporting to the General Storekeeper, Eastern Lines. Office, Toronto.

H. H. SMITH has been appointed Car Accountant, Eastern Lines, with jurisdiction over all lines east of Port Arthur, Ont. Office, Toronto.

G. W. CHAPMAN, late Trainmaster on 1st, 2nd, and 3rd districts, and formerly General Yard Master at Prince Albert, has returned to train service and is running as passenger conductor between Calgary and Camrose, Alta.

Canadian Pacific Ry.—JOHN LESLIE, heretofore Assistant Comptroller, has been appointed Comptroller. Office, Montreal. We are officially advised that it is not the intention to appoint an Assistant Comptroller at present.

F. E. SHRIMPTON, heretofore Auditor of

P 274 T. McHattie,
Master Mechanic, Eastern Lines, Grand Trunk Railway.

Disbursements, has been appointed General Auditor, vice H. L. Penny, resigned on account of ill health. Office, Montreal.

W. J. MOULE, heretofore Assistant Auditor, has been appointed Auditor of Disbursements, vice F. E. Shrimpton, promoted. Office, Montreal.

W. J. PERCIVAL has been appointed Auditor of Miscellaneous Accounts. Office, Montreal.

A. WEBB, heretofore Assistant Contract Foreman, Ottawa, Ont., has been appointed Assistant Contract Foreman, Montreal, vice A. McQueen, who has joined the Royal Navy on active service.

A. H. BINNS has been appointed District Master Mechanic, District 3, Ontario Division, Toronto, vice A. H. Hamilton, transferred to the company's board of examiners at Montreal and Ottawa.

E. L. LANDORPH, heretofore Resident Engineer, Brandon, Man., has been appointed Resident Engineer, District 2, Manitoba Division. Office, Winnipeg.

J. N. MURPHY, heretofore Resident Engineer, Suffield, Alta., has been appointed Trainmaster, Souris, Man., vice C. A. Washbon, transferred.

K. A. DUNPHY, Resident Engineer, Souris, Man., has also been appointed Bridge and Building Master there, vice L. Kinshella, transferred.

R. R. JELLY, heretofore Chief Dispatcher, Regina, Sask., has been appointed Chief Dispatcher, Souris, Man., vice J. H. Scott, whose transfer to Saskatoon, Sask., was announced in our last issue.

L. KINSHELLA, heretofore Bridge and Building Master, Souris, Man., has been appointed Bridge and Building Master, Regina, Sask.

J. H. McDIARMID, heretofore Trainmaster, District 1, Saskatchewan Division, Regina, has been appointed General Yardmaster, Regina, which position he formerly held.

W. E. HAYWARD, heretofore Roundhouse Foreman, Vancouver, B. C., has been appointed Locomotive Foreman, East Calgary roundhouse, Alta., vice W. A. Groves, who resumes his former position as hostler there.

J. B. McTAGGART, heretofore Superintendent, Moose Jaw, Sask., who was recently granted a month leave of absence, has, since his return, been appointed Bridge and Building Master, Edmonton, Alta., vice H. Marshall.

H. MARSHALL, heretofore Bridge and Building Master, Edmonton, Alta., has been appointed Bridge and Building Foreman there.

J. S. CARTER, heretofore in the Steamship Department, Winnipeg, has been appointed District Passenger Agent, Nelson, B. C., vice J. V. Murphy, whose appointment as General Agent, Portland, Ore., was announced in our last issue.

Grand Trunk Pacific Ry.—W. H. BIGGAR, K. C., General Counsel G. T. R. and G. T. P. R., Montreal, has also been appointed Vice President and General Counsel, G. T. P. R. Office, Montreal.

W. P. HINTON, Assistant Passenger Traffic Manager, Winnipeg, has also been appointed Assistant Passenger Traffic Manager, G. T. R. Office, Montreal.

D. E. SMITH, heretofore Locomotive Foreman, Biggar, Sask., has been appointed Locomotive Foreman, Regina, Sask., vice A. S. Wright, transferred.

A. S. WRIGHT, heretofore Locomotive Foreman, Regina, Sask., has been appointed Locomotive Foreman, Biggar, Sask., vice D. E. Smith, transferred.

Grand Trunk Ry.—W. P. HINTON, heretofore Assistant Passenger Traffic Manager, G. T. Pacific Ry., Winnipeg, has also been appointed Assistant Passenger Manager, G. T. R. Office, Montreal.

Owing to a rearrangement of the general officers of the Passenger Department H. G. ELLIOTT, General Passenger Agent, has retired under the Superannuation and Provident Fund Association's rules. W. P. HINTON, Assistant Passenger Traffic Manager, has assumed the duties of General Passenger Agent.

B. A. NEISSER, Freight Claims Auditor, having retired after over 40 years service, the position has been abolished, and all matters hitherto dealt with by him have been taken over by J. B. McLAREN, Auditor of Freight Accounts. Office, Montreal.

T. McHATTIE, heretofore Master Mechanic, Eastern Division, Montreal, has been appointed Master Mechanic, Eastern Lines. Office, Montreal.

M. O. DAFOE, formerly Travelling Pas-

senger Agent, Montreal, and latterly acting City Passenger and Ticket Agent there, has been appointed City Passenger and Ticket Agent, vice W. H. Clancy, retired.

J. MARKEY, heretofore Master Mechanic, Toronto, has been appointed Master Mechanic, Ontario Lines. Office, Toronto.

J. R. DONNELLEY, heretofore Master Mechanic, Northern Division, Allandale, Ont., has been appointed Assistant Master Mechanic, Ontario Lines. Office, Allandale, Ont. The position of Master Mechanic, Northern Division, has been abolished.

W. H. SAMPLE, heretofore Master Mechanic, Ottawa Division, Ottawa, Ont., has been appointed Master Mechanic, Western Lines, vice Garret Vliet, Master Mechanic, Western Division, deceased. Office, Battle Creek, Mich. The position of Master Mechanic, Ottawa Division, has been abolished.

H. G. SMITH, heretofore City Passenger and Ticket Agent, G. T. P. R., Vancouver, B. C., has been appointed Assistant City Passenger Agent, G. T. R., Grand Rapids, Mich.

The following station agents have been appointed,—Brockville, Ont., pass., A. E. Parker; Seagrave, Ont., F. S. Allin; Middlemiss, Ont., L. E. Baughman; Ekfrid, Ont., A. E. Beales; Sebringville, Ont., F. A. Malcolm; Burford, Ont., W. J. Meredith; Harley, Ont., G. Swan.

National Transcontinental Ry.—Consequent on the rapidly approaching completion of this line, the following officials have retired from the service. D. Macpherson, M. Can. Soc. C. E., Assistant to the Chairman; R. F. Uniacke, M. Can. Soc. C. E., Bridge Engineer; and A. L. Ogilvie, Purchasing Agent. W. S. Lawson is acting Bridge Engineer and G. A. Briggs acting Purchasing Agent.

GEO. S. HODGINS, Assistant Engineer, Mechanical Department, Ottawa, has resigned and removed to New York.

It is reported that 2,806 C.P.R. employes hold first aid certificates, an increase of 1,830 during the year ended Oct. 1. During the same period these men rendered first aid in 1,370 cases of accident or illness.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1913-14, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$1,594,300	$1,163,800	$420,500	x $83'800
Aug.	1,367,700	1,123,000	244,700	x 163,900
Sept.	2,109,900	1,519, 00	590,700	65,800
	$5,071,900	$3,806,000	$1,265,800	x$181,900
Decr.	$ 676,600	$ 494,700	$ 181,900	.....

x Decrease.

Mileage under operation at Sept. 30, 4,670, against 4,520 at Sept. 30, 1913.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1913-14, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$10.481,971.72	$6,703,525.89	$3,778,445.83	x$388 347.55
Aug.	8,917,764.38	6,554,606.68	3,373,157.70	x 597,981.54
	$20,399,736.10	$13,258,132.57	$7,141,603.53	x$936,328.89
Dec.	$ 3,027,786.05	$ 2,091,457.16	$ 835,328.89	.....

x Decrease.

Approximate earnings for September, $10,-479,000, against $11,887,000 for Sept., 1913.

At the end of September, the mileage under operating was increased to 12,319.

Grand Trunk Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, etc., compared with those for 1913, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$4 724,000	$3,668,200	$1,055,800	.....
Aug.	4,853,600	3,564,100	1,259,500	x$61,800
	$9,577,600	$7,232,300	$2,345,300	.....

x Decrease.

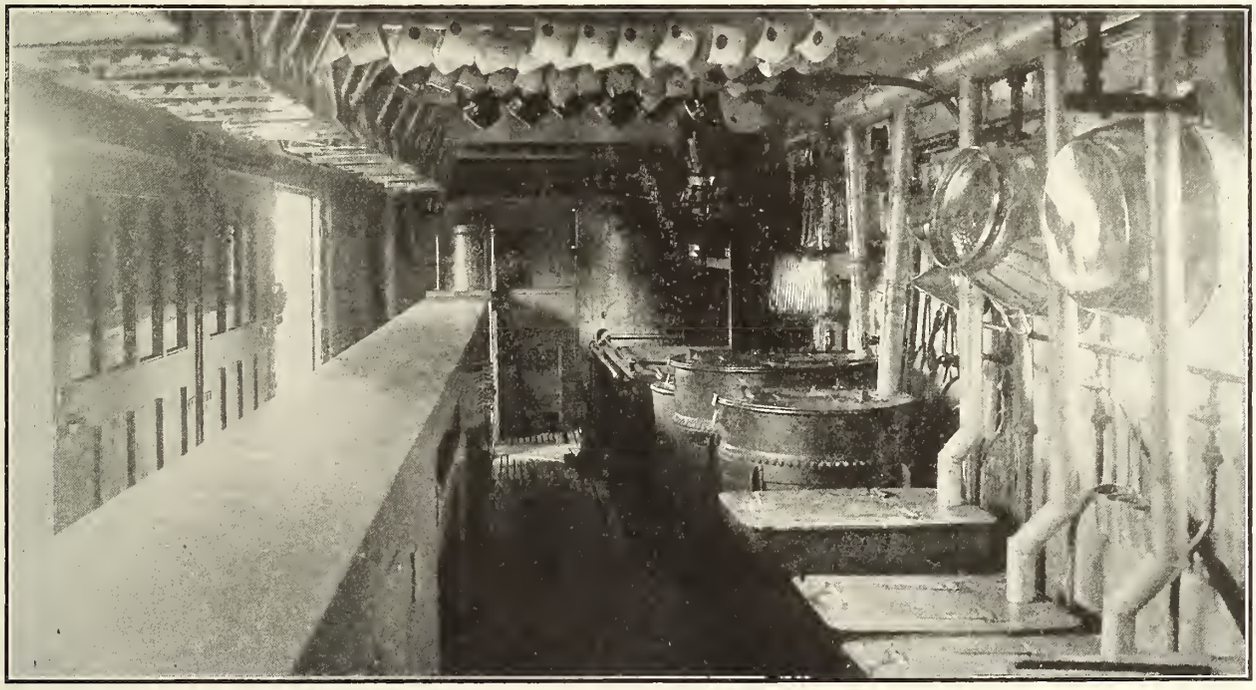
Approximate earnings for September, $4,671,-559, against $4,870,641 for Sept., 1913.

Mileage under operation at Sept. 30, 4,533, as at Sept. 30, 1913.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for September were $718,744, against $756,779 for Sept., 1913. Aggregate earnings for three months ended Sept. 30, $1,619,197, against $1,738,371 for the same period 1913.

N.T.R. Car Ferry.—In commenting on the final completion of the National Transcontinental Ry., which is expected to take place early in November, the Toronto Mail and Empire of Oct. 15 says:—"The war and its effect on naval shipyards in England has delayed the delivery of the car ferry Leonard for use between Quebec and Levis." The Leonard arrived at Quebec, Aug. 15, and announcement to this effect, with a description and illustrations of the vessel, were given in Canadian Railway and Marine World for September.



Interior of military commissary car, Canadian Pacific Railway.
A full description of these cars with floor plan was published in Canadian Railway and Marine World for October, page 463.

United States Shipping Registry.—It is reported from Washington, D.C., that 60 foreign built vessels, aggregating 233,781 tons, have been transferred to the U.S. register under the recently enacted laws. Of these, 54 were formerly in the British register, four were German, and two Belgian. Fifty-seven were operated on the Atlantic Ocean, and three on the Pacific Ocean; 19 were passenger vessels, 37 were freight vessels, and 4 were not placed. Ot the total 46 were steamships, and the balance sailing vessels and barges.

London and Lake Erie Ry. and Transportation Co.—The following directors have been elected for the current year: W. K. George, President; G. B. Woods, Vice President; G. O. Sommers, J. W. Scott, J. B. Holden, T. H. Purdom, J. Purdom, J. Milne. L. Tait has been appointed Secretary-Treasurer, and W. N. Warburton has been reappointed General Manager and Purchasing Agent.

Passenger rates between New York and Buffalo.—A press repore states that the applications of the New York Central and other railways to be allowed to charge a passenger fare of $9.75 between New York and Buffalo, N.Y., in either direction, has been refused by the Interstate Commerce Commission, which held that as a combination of fares between intermediate points totals only $8.50, a $9.75 rate would be unreasonable.

Cornwall St. Ry. Light and Power Co.—The ratepayers of Cornwall, Ont., on Oct. 14, passed a bylaw extending the company's franchise for 20 years.

Canadian Pacific Railway Construction, Betterments, Etc.

A statement as to work on the C.P.R. for this year showed that up to mid September there had been graded 555 miles, as compared with 499 in the same period of 1913, and in addition there had been completed second track for 113 miles. Furthermore, the company is going ahead with extension work, the mileage under construction on western lines, not including double tracking, being 500 miles. The operated mileage between Port Arthur and Vancouver was 7,632 on Sept. 17, as compared with 6,971 a year ago.

The company issued orders recently for the employment of 6,000 men, married men with families having the preference, to engage in ballasting and other work, on the various divisions. A very large part of this work is in progress on the western lines, about 1,000 men being given employment on the lines in Saskatchewan, and 12 work trains, fed by six steam shovels and operated by large gangs of men were put to work on the lines in Alberta, Sept. 28.

Eastern Division.—Rapid progress is reported to have been made with the new station building at the Palais, Quebec.

The improvements at Place Viger, Montreal, which included the reconstruction of the station, the enlargement of the hotel, and considerable rearrangement of the yards at Montreal, are reported to have been completed. The work was in progress for about three years.

Lake Superior Division.—Second track is now in operation between the following points:—

	Miles.
Romford Junc. and Sudbury	6.8
Azilda and Cartier	26.6
Cartier and Geneva	3.1
Roberts and Woman River	25.9
Nemegos and Chapleau	16.5
Chapleau and Esher	9.0
Healey and Bolkow	19.1
Depew and White River	5.3
White River and King	21.8
Heron Bay and Peninsula	8.4
Amy and Rossport	5.1
Cavers and Gurney	11.0
Fire Hill and Ruby	4.0
Navilus and Port Arthur	7.9
Total	170.8

Manitoba Division.—A very large amount of work is in progress at the Winnipeg station and at the Royal Alexandra Hotel. Considerable changes are being made in the interior arrangements of the station. New baggage and express rooms are being located on the north side of the station, but beneath the tracks, with which there will be elevator connection. The present baggage and express section is to be turned into a second class waiting room. Stairways will lead from this to a concrete paved area under the tracks, from which stairways will ascend to the platforms, all of which will be covered. A subway is being built underneath the tracks at the east end to connect with the present immigration hall. This building is to be utilized for post office purposes as soon as the new immigration hall is completed. A new subway is under construction at Main St. In the hotel building the new wing will contain a ball room, dining room, grill room, private dining rooms, etc. Other improvements are also being made and a considerable portion of the ground floor is being rearranged.

The line from Boissevain to Lauder, Man., 36.9 miles, forms a cut off between the Napinka and Esteven subdivisions, and connects at Lauder with the Griffin subdivision for Aleda.

The new Virden-McAuley line, 36.6 miles, makes an alternative route with that via Kirkella.

Saskatchewan Division.—On the Weyburn-Lethbridge line an additional 77.5 miles or track was put in operation, Oct. 7, between Shaunavon, mileage 230.8, and Gowanlock, Sask., mileage 307.3. There are 11 stations on the new section.

The extension of the line from Kerrobert to Monitor, 75 miles, which has been opened for traffic, makes a complete line from Moose Jaw, via Outlook and Kerrobert to a junction with the Edmonton subrivision at Lacombe, 444 miles, and gives the choice of seven C.P.R. routes between Winnipeg and Edmonton. On the 75 miles just opened for traffic there are six stations in Saskatchewan and four in Alberta, the track crossing the provincial boundary line between Court, mileage 37.3 from Kerrobert, and Compeer, mileage 43.3.

The Empress-Bassano line is reported completed and in operation. Its completion gives a line of 235.8 miles from Swift Current to Bassano, Empress being 117.5 miles from the first named point. A locomotive house, coaling plant and station buildings are under construction at Empress.

Alberta Division.—The newly opened line from Red Deer to Rocky Mountain House, Alberta, built as the Alberta Central Ry., is 64.8 miles long.

A new line, somewhat south of the main line, but passing through new country, has been opened for traffic between Gleichen and Shepard, Alberta, 33.9 miles. This gives two lines between these points.

British Columbia Division.—The Board of Railway Commissioners has authorized the opening for traffic of the following mileages of second track:—Mileage 0.4 to 24.00, and mileage 103.4 to 128.9, Shuswap Subdivision; mileage 0.5 to 8.7, Thompson Subdivision, B.C.

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

Rates on Groceries in Mixed Carloads.

General Order 132. Oct. 2. Re complaints of Montreal, Toronto, Hamilton and Edmonton Boards of Trade, the Shippers' Section of the Winnipeg Board of Trade, the Ontario Wholesale Grocers' Guild, the British Columbia Wholesale Grocers' Exchange, the Retail Merchants' Association of Canada (Saskatchewan Provincial Board), the wholesale grocers of Regina, the Dominion Wholesale Grocers' Guild, and Balfour, Smye & Co., against the cancellation of mixing privileges in connection with carloads of groceries, dried fruit and liquors from Eastern Canada points to points in Western Canada. It is ordered that the railway companies which, immediately before Sept. 1, 1914, had in effect, by tariffs filed with the Board, arrangements whereby mixed carloads of groceries, classifying 5th class in straight carloads, and dried fruits, classifying 4th class in straight carloads, also foreign and domestic liquors in mixed carloads, were carried in each case at the carload rates applicable to each commodity, respectively, to destinations west of and including Port Arthur, Ont., file tariffs restoring the said arrangements and making them effective from and including Sept. 1st, 1914, until otherwise ordered by the Board, the said arrangements having been abolished by tariffs filed by the following railway companies:—Algoma Central, Boston & Maine, Canadian Northern, Canadian Pacific, Central Vermont; Chatham, Wallaceburg & Lake Erie; Dominion Atlantic, Essex Terminal, Grand Trunk, Grand Trunk Pacific, Great Northern, Hull Electric, Michigan Central, Midland of Manitoba, New York Central & Hudson River, Ottawa & New York, Pere Marquette; Quebec, Montreal & Southern; Quebec Railway, Light & Power; Schomberg & Aurora; Thousand Islands; Toronto, Hamilton & Buffalo; Wabash; Windsor, Essex & Lake Shore Rapid.

Standard Mileage Tariff, C.N.R.

22657. Oct. 2. Re application of Canadian Northern Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Mileage Tariff, to apply between its stations east of and including Westfort, to supersede C.R.C. no. E. 212, approved by order 19006, April, 9, 1913, and order 21209, Jan., 14, 1914. It is ordered that the Standard Freight Mileage Tariff be approved.

Rates on Stone.

22664. Oct. 6. Re application of Standard Crushed Stone Co., of Niagara Falls, Ont., for an order directing the G.T.R. to file rates from its siding at Windmill Point to points on its railway and on the Michigan Central Rd., as particularly set forth in the application. It is ordered that the G.T.R. file, with the concurrence of the Michigan Central Rd., the following rates per ton of 2,000 lbs. on cobble, crushed, field or rubble stone, in carloads, of a minimum weight of 60,000 lbs. a car, from its Windmill Point siding to the stations on its line of railway and on the Michigan Central Rd., following, to take effect not later than October 15:—To Ridgeway, 30c.; Amigari and Bridgeburg, 35c.; Port Colborne, Humberstone, Stevensville, Wainfleet, Welland and Feeder Siding, 40c.; Black Creek, 45c.; Chippewa and Vic-Thorold, Merritton, Moulton, St. Catharines and Niagara Falls, 50c.; Dunnville, Port Dalhousie, Jordan, Canfield Junction, Vineland, Beamsville, Cayuga, Grimsby and Caledonia, 55c.; Hamilton, Brantford, Paris, Oakville, Port Credit and Toronto, 60c.; Shipyard, 40c.; Black Creek, 45c.; Chippawa and Victoria Park, 50c.; St. Davids and Niagara-on-the-Lake, 60c.

Great Northern Railway Lines in Canada.

Midland Ry. of Manitoba.—A press report states that a contract has been let to W. J. Holmes, for the trestle work on the company's spur line in Winnipeg, and to C. W. Sharp and Sons, for the crossings over streets, and that the work is to be started at once.

Vancouver, Victoria and Eastern Ry. and Navigation Co.—It was reported Oct. 10, that track had been laid on about two-thirds of the 26 mile section from the present terminal at Coalmount, to Otter Summit, B. C. Ballasting is in progress, and the construction is expected to be completed by the end of the year.

New Westminster Station.—The Mayor has reported to the New Westminster City Council that the agreement with the G. N. R. with respect to the new station in that city has been signed on behalf of the B. C. Government. The work is expected to be started early in 1915. (Oct., pg. 469.)

The C.P.R. officers' and employes' contribution of one day's pay to the Canadian Patriotic Fund yielded $140,316.71, and the staff of the Dominion Atlantic Ry., a C.P.R. subsidiary, gave $1,421.93. The amounts given in the different Provinces were, British Columbia, $18,000; Alberta, $18,000; Saskatchewan, $15,000; Manitoba, $28,000; Ontario, $28,000; Quebec, $28,000; New Brunswick, $5,316.71; Nova Scotia, $1,421.93. In addition to this the company gave $100,000 and directors and officers have also made large personal contributions.

Canadian Northern Railway Construction, Betterments, Etc.

Montreal Tunnel and Terminal Co.—The tunnel has been widened to the full height and width for nearly 2,000 ft. from the western portal at the Model City. It is 35 ft. wide and 22 ft. high. The work of lining it with concrete blocks has been started. The electrical substruction at the western end of the tunnel is about two-thirds completed.

Canadian Northern Ontario Ry.—The first freight train from Toronto arrived in Port Arthur, Ont., Oct. 10. The section of the line from Capreol to Ruel has been operated over for some time, but the Ruel-Port Arthur section has only been finally completed recently. The line from Capreol to Port Arthur forms part of the Montreal-Ottawa-Port Arthur section of the company's transcontinental line. The line from Toronto to Capreol will be the Toronto branch of the transcontinental line.

We are officially advised that although a train of stock cars went over the line as stated, it has not yet been opened for public traffic.

Canadian Northern Ry.—It is reported a site has been acquired in Fort William, Ont., for the erection of a new station. The ratepayers will be asked to sanction the plans before the purchase is completed.

Reports were current in Moose Jaw, Sask., Oct. 12, that the clearing of houses and other buildings on the land purchased for the C. N. R. right of way meant the immediate building of a line directly into the city, and the building of a central station to replace the present one at South Hill. The report is also revived that a union station with the Grand Trunk Pacific Ry. is being arranged for.

The Saskatchewan Legislature has extended the time within which the Canadian Northern Ry., and the Canadian Northern Saskatchewan Ry., may build the lines for which the province has guaranteed bonds. This act covers the lines which are under construction and gives an extension of time to Jan. 1, 1917, for their completion; and extends the time for the starting of the other lines to Jan. 1, 1917.

A press report states that a contract has been let for the grading of 23 miles from Medicine Hat to Hanna, Alberta, to the Northern Construction Co. The Mayor of Medicine Hat returned to the city from Winnipeg, Oct. 8, and is reported to have stated that Sir William Mackenzie informed him that this work would be started immediately.

Ballasting is being proceeded with on the line from Camrose to Edmonton, and it is expected that a train service will be put on by the end of the year.

The line from Stettler to Nordegg, Alberta, 123 miles, has been taken over by the operating department, and a train service put on. It is reported that about 900 tons of coal a day are being shipped from the collieries at Nordegg.

Track was laid on the Onoway-Grand Prairie line in 1913 to the Pembina River, mileage 32. A bridge is under construction over the river, which involves 2,000 ft. of trestle work, and 400 ft. of steel work, the latter at a height of 74 ft. Grading is reported to be completed to the McLeod River at Whitecourt, 43 miles from the Pembina. The McLeod River will be crossed by a bridge 600 ft. long, which will not be built until the track reaches Whitecourt.

Canadian Northern Pacific Ry.—Sir William Mackenzie returned to Toronto, Oct. 2, from a trip over the line. He is reported to have said in an interview, that there now remains about 90 miles of track to be laid between the ends of steel being pushed westerly from the Yellowhead Pass, and easterly from Kamloops. The work had been somewhat delayed by the slowness of deliveries of steel for the bridge work, but he expects to see the track laying completed in December.

Vancouver Terminals.—A press report states that a contract has been let to H. Peterson, for the erection of a temporary wall, 2,000 ft. long, in False Creek, Vancouver, to hold back material to be dredged from the creek and poured in, and that the work is to be started at once. (Oct., pg. 467.)

Grand Trunk Pacific Railway Hotel at Edmonton.

The G. T. P. Ry. hotel in Edmonton, Alberta, which is to be known as the Macdonald, is reported to be about completed. It overlooks the Saskatchewan River at an elevation of about 200 ft., and commands extensive views both up and down the river. The building is of the chateau style, which the company has adopted for all its hotels, but each building has an individuality of its own. The building is L shaped, the right wing parallels McDougal Ave., and the left the side street. The right wing is 115 by 55 ft., and the left 165 by 87, with an entrance connecting the two wings. The main doorway gives entrance to the rotunda, lounge rooms, offices, tea room, dining room, ball room, and the other public rooms; while the kitchens, etc., are beneath. The mezzanine floor overlooks the rotunda, and opens on the terrace over the main entrance. It comprises a ladies' drawing room, men's writing room, banquet room and three private dining rooms. There are five floors above for bedrooms, 22 rooms on each floor being fitted with bathrooms. On each floor are public lavatories and bathrooms, service rooms, etc. The interior of the entire building has been most carefully planned, and the decorations and appointments are the most modern. The architects are Ross and Macdonald, Montreal, and the contractors are the Canadian Stewart Co. The date for opening the hotel has not been announced.

Australian Freight and Passenger Rates Advanced.

Increases in freight rates of 10%; and in passenger fares ranging from 5 to 50%, are the means by which the government railways of New South Wales, Australia, have undertaken to combat the world wide advance in costs of railway operation. The annual report of these railways as analyzed by the Bureau of Railway News and Statistics, presents detailed outlines of the advances, and attributes them almost wholly to the expansion in wages and costs of materials.

This is looked upon as the most striking recent instance of the facility with which state owned railway systems have been adopting advances in rates to cope with the rapid rise of late years in operating expenses, and is in sharp contrast to the experience of the private transportation systems of the United States, where, in spite of recognition by the Interstate Commerce Commission of pressing need, eastern railways have been refused a 5% advance covering only freight rates, and under emergencies caused by the European war the roads have had to petition for a reopening of their case owing to actual threatening of their credit structures.

Increased charges for freight transportation placed in effect by the New South Wales government roads are uniformly 10%, and with the estimated annual increase in revenue are as follows:—

1st and 2nd class freight rates	$350,000
Class A, B and C mileage rates	230,000
Live stock rates	300,000
Total added freight revenue	$880,000

Advances have been made in passenger fares, despite the fact that "cheap excursion fares" already were on a basis of 4c. per mile first class, and 2c. per mile second class, while "special cheap excursion week end rates" were 3½c. per mile first class, and 1¾c. per mile second class, compared with an average of only 2c. per mile received for all passenger traffic by United States railways in 1913. The increases range from 5% in the case of through fares, to 50% in second class excursion fares. The total new yearly revenue from both services is estimated at $1,750,000, or more than 5.3% of gross operating revenues in 1913. A similar increase in the United States would amount to almost $169,000,000.

In explanation of the increases the minister of the government railways points out that expenses rose $3,742,000 in the last year, of which $2,704,000 was in wages. The operating ratio rose from 68.8% in 1913 to 69.9% in 1914. Wages took up $49.68 of every $100 revenue in 1914, against $48.80 in 1913.—Railway Review, Chicago.

Railway Rolling Stock Notes.

The Intercolonial Ry, has received 2 express refrigerator cars from its Moncton Shops.

The C.P.R., between Sept. 15 and Oct. 15, ordered 9 refrigerator cars from its Angus Shops.

Randolph Macdonald Co., Toronto, has ordered one 4-wheel switching locomotive from the Montreal Locomotive Works.

The Intercolonial Ry. has ordered 6 steel frame 1st class cars from Canadian Car and Foundry Co., and 1 wrecking crane of 100 tons capacity.

The C.P.R., between Sept. 15 and Oct. 15, received 69 steel frame box cars, 7 steel first class cars and 1 class W locomotive, from its Angus Shops.

In 1913 the C.P.R. built 81 locomotives in its Angus Shops, Montreal. It is stated that only one railway in America built more in its own shops during the year.

The G.T.R. has received 4 suburban type locomotives from the Montreal Locomotive Works; 7 first class cars from the Canadian Car and Foundry Co., and 5 baggage cars from the National Steel Car Co.

The Canadian Car and Foundry Co., during September, delivered 11 wooden colonist cars to the Canadian Northern Ry.; 6 steel frame first class cars to the G.T.R., and built 1 all steel 40 ton box car for its own purposes.

A press report from Edmonton, Alta., states that the Edmonton, Dunvegan and British Columbia Ry., has the following rolling stock:—100 box cars, 12 refrigerator cars, 60 ballast cars, 11 passenger cars, 1 private car and 6 locomotives, while other rolling stock is on order, delivery of which will be made shortly.

New York Central Merger Approved.—The consolidation of the New York Central and Hudson River Rd. with the Lake Shore and Michigan Southern Ry. has been approved by the New York Public Service Commission, Second District.

General Inspection of the Grand Trunk Lines.

Some 50 G.T.R. officials, drawn from all parts of the system, have been making a tour of inspection of the company's various lines. They travelled in a special train of nine cars, including an inspection car, designed for the trip, which is fitted with large glass panels, allowing an uninterrupted view of the line, and with electrically controlled apparatus for recording the impressions of the observers. It has seats arranged in tiers, row above row, in order that every occupant may view the right of way as the train proceeds. Thus every part of the track comes in for the closest scrutiny from men whose business is track construction and maintenance.

The annual inspections have been made in the past by a limited number of the higher officials. H. R. Safford, the Chief Engineer, decided this year to broaden out this inspection. The object was to make the men actually doing the work the judges of what has been achieved in the way of track improvement. The track superintendents and track supervisors, and representatives of other ranks, were summoned from the various districts, as far west as Chicago, to assist their superior officers in the inspection, and they started from Portland, Me., the Atlantic terminus of the system, on Oct. 14. They travelled over some 1,500 miles of track, the inspection proceeding from 6 a.m. to 6 p.m. Each day a special committee was appointed, composed of track supervisors, another the spacing of the ties, others ballast distribution, neatness of station grounds and buildings, fencing, spikes, side tracks, and the level and gauge of the rails. Before each man was a series of electric push buttons, and as each mile post was passed he gave his report, awarding points according to the excellence of the work he was inspecting. These awards were flashed up on an indicator board and clerks recorded them. At the end of every section—four miles of double track, or five miles of single—an average was made and the section showing the best results in each division of the line will very shortly bear a board announcing the fact. There was naturally the keenest competition to obtain these honors. Section was competing against section, and division against division. The committees were so arranged that an absolutely impartial judgment was obtained. The men taking part in the lengthy trip also found it valuable from an educational standpoint, for they were given an opportunity of seeing what was being done on the other sections of the line. They were also brought into close contact with the company's officers and a healthy spirit of co-operation was developed.

H. G. Kelley, Vice President in charge of construction, maintenance and operation, joined the party at Montreal. Others taking part were: H. R. Safford, Chief Engineer; M. S. Blaiklock, Engineer Maintenance of Way; U. E. Gillen, General Superintendent, Western Lines; H. E. Whittenberger, General Superintendent, Ontario Lines; and C. G. Bowker, General Superintendent, Eastern Lines; with divisional superintendents and their staff officers.

Grand Trunk Trainmasters.—We are officially advised that the G. T. R. management has no intention of abolishing the positions of trainmasters over the system, as has been persistently stated in daily papers.

W. J. DeWolfe, Halifax, N.S., in writing to have his address changed, says: "I do not care to miss any of the valuable material I find in Canadian Railway and Marine World each month."

Restoration of the Canadian Pacific Railway Elevator at North Transcona.

The C.P.R. elevator at North Transcona, Man., which settled and listed to an angle of 27 degrees in Oct., 1913, has been brought back to a plumb position except on the east and west axis, after a number of interesting and difficult pieces of work. Both the handling house and storage bin structures were originally constructed on a reinforced concrete mattress, this plan having been followed as the usual tests indicated sufficient strength to carry it without going to bed rock. Other elevators have been erected in like manner in that vicinity without mishap. When the settlement of the bins occurred, the low corner of the foundation mattress settled to a point very much below the mattress of the handling house, but fortunately the latter structure was not disturbed to such an extent that any movement occurred in it. Before, however, the work could be done of underpinning or strengthening the bins, it was necessary to secure the handling house and this was done by first sinking shoring piers to rock outside of the main handling house structure. On these shoring piers were placed timber pushers, or shores, which were figured strong enough to carry a very large proportion of the total weight of the building. The work of underpinning the columns of the handling house was then proceeded with by cutting through the mattress in the panel between columns and drifting in to a point under the centre of the columns, and there sinking a pier to rock by the Chicago method.

After the underpinning of the handling house structure had sufficiently advanced so as to make its stability absolutely certain, work was begun on the straightening of the bins. The latter structure weighs about 20,000 tons and consists of 5 rows of Chicago wells of 14 each; these piers being located under the contracts of the bins. Before any movement was allowed to take place, the mattress was penetrated and Chicago wells sunk underneath the low corner of the mattress; the intention being to avoid any possibility of the structure sinking further into the ground. On the east or high side the general excavation was made to a point about 15 ft. below the high corner of the mattress, the full length of the building. By the use of a belt conveyor placed along this excavation, which delivered into the elevator at the north end, the excavated material was removed at a minimum cost. After the low corner was made secure, work became general on sinking the other foundation piers, at the same time loosening up the supporting ground from the high side of the structure and allowing it gradually to sink back towards a plumb position. This method was followed out until the structure reached an angle of 18 degrees off plumb, when a series of solid oak rockers was introduced in the mattress; on top of the middle line of piers jacks or shoring screws were placed underneath the low side, working on top of the piers that were in place, and by jacking the low side and bleeding the earth out from under the high side the structure was gradually brought back until it was 8 degrees off plumb, when another line of oak rockers was introduced on the next line of piers, east of the middle. This was done in order to give the structure an additional lift, which when it was brought plumb would leave the bottom of the tunnels above the natural ground water level.

During settlement of the elevator, on account of the ground being somewhat softer on the north end, and the supporting ground on the south end being prevented from flowing, due to location of the workhouse, the north end of the elevator settled about 5 ft. lower than the south end. Therefore in straightening the elevator on the north and south axis, the inclination on this axis, amounting to about 5 ft. in total length, has remained the same, and the elevator at present is not exactly plumb on east and west axis. There is no loss of efficiency, convenience of operation or safety and for this reason it is not intended to take the time to bring the elevator plumb on the east and west axis.

In all, the structure was lifted up about 12 ft. during the process of straightening. The method adopted for restoring the elevator to a condition for operation has proved efficient and very economical, as compared to the question of taking down the old structure and rebuilding.

The Bridle Belt Ry. and Navigation Co. proposes to lay out railway and steamship terminals at Seattle, Wash., at a total cost of $15,000,000. It is stated that as projected the first unit of the terminal will consist of two docks, each 200 by 800 ft., and 4 stories high; an 8 story building 500 by 500 ft. in dimensions, and a 20 story 250 by 500 ft. hotel and office building. The terminals will be connected by a three mile tunnel to Lake Union large enough to provide clearance for a double track railway. The tunnel portion of the project will cost something like $2,000,000. It is proposed to construct the terminal near lower Pike St. and the 8 story building on Railroad Ave. The 20 story structure would face on First Ave. and 10 stories of the building would be below the level of that street. The reports further state that two Canadian railways will be provided with terminals. A. P. Gillies, Seattle, Wash., is one of the promoters, and the Stone and Webster Corporation, Boston, Mass., are said to be interested.

Conductors for Light Locomotives—The attention of the Board of Railway Commissioners having been called to different interpretations put upon section 4 of order 12225 (general order 65) it is ruled: that in the case of the movement of a light locomotive, or two or more light locomotives coupled, for a distance greater than 25 miles, when the movement is either on a single track or against the current of traffic on a double track, the word "conductor" as used in section 4 of the said order 12225, shall mean one regularly appointed for service as a conductor and possessed of the qualifications set out under sub-section b of sec. 6, of the aforesaid order.

Railway Lands Patented.—Letters patent were issued during August, covering Dominion railway lands in Manitoba, Saskatchewan, Alberta and British Columbia, as follows:—

	Acres.
Alberta Central Ry.	7.54
Calgary and Edmonton Ry. ...	2,086.61
Canadian Northern Ry.	638.00
Canadian Pacific Ry.	6.45
Kootenay Central Ry.	183.24
Total	2,921.84

Alfred Berglund, son of CHARLES BERGLUND, section foreman, C. P. R., Finmark, Ont., accidentally shot himself dead while moose hunting recently.

The design of drop forge dies should be such that draft be allowed to prevent the forgings sticking to the dies.

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Six Thousand Extra Laborers Employed on the Canadian Pacific Railway.

Just after Canadian Railway and Marine World's last issue had gone to press it was announced by the C.P.R. management that the operating departments of its eastern and western lines had been authorized to take on 6,000 extra laborers for suitable work during October and November at current rates of wages. The object of this measure, it is explained by the management, is to help to furnish employment before winter and relieve possible distress occasioned by the temporary dislocation of business due to the war.

Dominion Subsidies for Electric Railways in Ontario.

In speaking at several meetings in the territory just east of Toronto recently, in advocacy of the construction of radial electric railways by the municipalities, under the auspices of the Hydro Electric Power Commission of Ontario, Sir Adam Beck, Chairman of the Commission, is reported to have said:—

"We are not going on until we secure from Ottawa definite assurance that the railways of the people shall have at least some of the consideration lavished upon promoters of corporate-owned enterprises. This is the people's business. We have no promoters' profits and no watered stock in this enterprise. It is conducted on a business basis. It is true we have no definite word from Ottawa yet, but you people will have the say. It remains for you to determine in the last analysis. If one Government fails to do its duty to the people, they have it in their power to elect another one."

This is in line with the Ontario Legislature's action last session in memorialising the Dominion Government to encourage the construction of municipal hydro electric railways in Ontario and asking that Dominion Government subsidies be given for the building of such lines. Sir Adam Beck's remarks infer that privately owned electric railways have received Dominion subsidies, but such is not the case. Only one electric railway in the whole of Canada received a Dominion subsidy, the exception being the Oshawa Ry. in Ontario, which when the subsidy was granted was projected as a steam line, though it had the right to use any other motive power. It was given a Dominion subsidy of $3,200 a mile.

We are offering no objection to the granting of Dominion subsidies for municipal hydro electric railways in Ontario, but should such subsidies be granted, then in all fairness similar subsidies should be paid to the suburban or interurban railways already built in Ontario and other provinces by private capital. There is a precedent for retroactive action of this sort in the subsidy granted the Timiskaming and Northern Ontario Ry. by the Dominion Parliament last year.

The Change in the Postmaster Generalship.

If the retirement from the Government and from Parliament of the Hon. L. P. Pelletier is on account of ill health, as stated, it is of course to be regretted, but on other accounts there will be no regret, and the change is especially welcome to newspaper publishers generally throughout the Dominion and by the management of city electric railways.

For two sessions in succession, Mr. Pelletier sought to get Parliament to confer on him the power to decide what compensation shall be paid electric railway companies for the transportation of postmen, and steadily refused to allow the matter to be settled by the Board of Railway Commissioners, until the Canadian Electric Railway Association's representations, before the Senate Committee on Banking and Commerce, compelled him to back down.

Last session, after breaking faith with the Canadian Press Association, he tried to smuggle a bill through Parliament to transfer from Parliament to the Postmaster General, the power to decide the rate to be paid for the transmission of newspapers through the mail. In this attempt he was defeated by the opposition given to his measure on behalf of the Canadian Press Association, particularly by the chairman of its postal committee, P. D. Ross, proprietor of the Ottawa Journal, and a supporter of the Government, and by some other individual publishers, and there is no doubt that the hostility he aroused by his arbitrary course proved a source of weakness to him. In commenting on his actions in July, Canadian Railway and Marine World said:

"The Premier is conversant with the facts. Believing as we do in his high-mindedness and absolute probity, we cannot think that he can approve of such arbitrary methods and we look to him to restrain his colleague. If this is impossible it would be advisable to transfer the P.M.G. to some other position, preferably outside the cabinet, where his opportunities for the perpetuation of glaring injustice would be at least minimized."

We felt that Mr. Pelletier's retirement from the Postmaster Generalship was absolutely necessary in the interest of fair play, and while the alleged cause of his retirement is to be regretted, it is satisfactory that his opportunities for securing dangerous legislation are at an end.

The new Postmaster General, T. Chase Casgrain, has a good record. We hope he will show firmness and independence in his administration of the department, and that he will refuse to be misled by permanent officials, some of whom appear to think that they are the masters of the people and not its servants.

Sir Adam Beck, Chairman of the London, Ont., Railway Commission, is reported to have announced that some 40,000 old ties taken out of the London and Port Stanley Ry. will be distributed among the poor of London and St. Thomas for fuel.

Intercolonial Ry. employes in the first Canadian overseas contingent numbered 149 and it is expected that many more will volunteer for the second contingent. A press report says that they will be allowed full pay during their absence and that their positions will be kept for them.

The Toronto Board of Control has instructed the Corporation Counsel to apply to the Board of Railway Commissioners for an order directing the railway companies to electrify all their lines in the city, and for a distance of two miles from the city boundaries.

British Exhibit Train.—It is stated that included in the scheme which is being worked out by the Canadian Chamber of Commerce in London, Eng., to promote the extension of British trade in Canada, is the idea to send a British built train, with exhibits of British manufactures, to tour the Dominion. It is stated that the whole train, including the locomotive, is to be built to suit Canadian requirements, so that when the purposes of the exhibition have been served, it may be sold to a railway company on this side.

Canadian Pacific Railway Company's Annual Meeting.

Sir Thos. G. Shaughnessy, President, who took the chair at the annual meeting in Montreal, Oct. 7, in moving the adoption of the report for the year ended June 30, as published in Canadian Railway and Marine World for September, said:—

The contraction in the volume of trade and travel during the last half of the fiscal year under review was greater than your Directors anticipated when they had the privilege of meeting the shareholders a year ago, and the effect on your revenue in every branch of the service was quite pronounced. However, with the property in splendid physical condition, and with the facilities for economical operation that had been provided at large cost in recent years, your operating officials were enabled to make a substantial reduction in working expenses, and the decrease in net revenue was far more moderate than it would have been in other circumstances.

Since the close of the fiscal year the unrest and uncertainty resulting from the outbreak of the European war has created a condition of affairs unique in the company's history, and any attempt to forecast the business situation in the immediate future would, at this stage, serve no useful end.

The crops recently harvested in Western Canada, although probably 15% to 20% less in volume than they were a year ago, owing to an insufficient midsummer rainfall in some sections, will yield the producers a larger gross return because of the high prices that prevail in the markets, and the purchasing power of the producers will be improved accordingly. This should have the effect of stimulating westbound traffic, with a favorable influence on your earnings, but to what extent this influence may be counteracted by the unsatisfactory business conditions that prevail generally cannot be estimated with any degree of accuracy at this time.

When the peace of the world has been restored, emigration from Europe to the newer countries, where lands can be obtained on moderate terms, will doubtless be on a large scale, and Canada should profit very substantially by the incoming of new settlers and the consequent increase in production. The serious setback that our country experienced in the past two years was due unquestionably, in a considerable measure, to our rapid growth and increase of wealth, with the consequent optimism that clouded the effect of unsound speculation in lands and industrial enterprises and of railway schemes years in advance of their time, but it was due in a greater degree to external causes in which Canada had no share. The period of retrenchment and financial conservatism that the country has passed through will have had the effect of liqidating to an important extent the injurious results of domestic mistakes, and Canada, when the tide turns, will be ready with renewed sturdy strength to utilize her almost unlimited resources and prosecute her plans for agricultural, industrial and commercial development on sane and logical lines. Your directors have the same implicit faith in the future growth and prosperity of the country that they have had from the beginning.

The large railway mileage that you had in process of construction has been practically completed, and the only important works now in hand are the tunnel in the Selkirk Mountains, the passenger and freight terminals at Quebec that are to be used jointly by this company and the National Transcontinental Ry., and the station at North Toronto. No new expenditures of any consequence will be required for some time to come.

As indicated by the annual report, your finances are in excellent shape. While the balance in banks is, of course, not as large as it was at June 30, the amount is still a very substantial one, a fortunate circumstance in these trying times, and you have over $50,000,000 of securities to issue with reference to completed railway lines and rolling stock equipment for which the money was advanced from your treasury. With some improvement in financial conditions such portion of these securities as may be thought desirable can be readily sold.

On May 29 the Company's Atlantic steamship Empress of Ireland was rammed by a collier and sunk in the St. Lawrence River near Father Point. The injury to the steamship was of such a character and so serious that there was little opportunity for rescue before the vessel foundered with a lamentable loss of life. A royal commission appointed for the purpose of investigating the circumstances made a report acquitting the company and its officers of all blame, and held the collier accountable for the disaster. Nevertheless, I am sure that all the shareholders join with the directors and officers in a feeling of profound sorrow for those who lost their lives while travelling under the company's auspices, and of deep sympathy for their relatives and friends. The monetary loss was not a matter of any special moment.

Your directors have selected J. K. L. Ross, of Montreal, to fill the vacancy in the Board resulting from the death of the late Lord Strathcona, and his name will be submitted for your ballot with the names of the other two directors whose term of office has expired.

At a special general meeting to be held upon the adjournment of this meeting there will be submitted for your consideration a proposal to increase the authorized ordinary capital stock from $260,000,000 to $335,000,000. This is essentially a precautionary measure for the future, establishing your right to issue new capital when your traffic has reached such proportions as to compel further large additions to your property.

The report having been adopted a number of resolutions were passed, as foreshadowed in the report, relating to the Toronto union station; the agreement between the Kettle Valley Ry. Co., and the Vancouver, Victoria & Eastern Ry. Co.; the leases of the Kettle Valley Ry., the Lake Erie and Northern Ry., the Southampton Ry., the Fredericton and Grand Lake Ry., and the Glengarry and Stormont Ry.; relations with the Spokane and International Ry., and re the office of Assistant Secretary. Sir Thos. G. Shaughnessy, Sir Thomas Skinner were re-elected directors, and J. K. L. Ross was also elected to serve for four years. At a special general meeting, held immediately after the annual meeting, an increase of the capital stock from $260,000,000 to $335,000,000 was authorized.

At a subsequent meeting of directors Sir Thos. G. Shaughnessy was re-elected President; D. McNicoll, Vice President, and the following as the executive Committee:— R. B. Angus, H. S. Holt, D. McNicoll, Sir Edmund B. Osler, Sir Thos. G. Shaughnessy, Sir Wm. C. Van Horne.

Canada has not gone to pot yet! Canadian railway presidents, Sir William Mackenzie and E. J. Chamberlin, have "come out of the West," enthusiastic and optimistic.—Financial Times.

Canadian Ticket Agents' Association.

The association held its annual outing this year in Chicago, where Oct. 6, 7 and 8 were spent. At the opening of the business meeting addresses of welcome were given by two city officials and the President of the British Empire Association. J. Kidd, ticket agent, C.P.R., Goderich, Ont., was elected President, and E. de la Hooke, of London, Ont., who has been continuously Secretary-Treasurer since the association's organization, 27 years ago, was unanimously re-elected.

G. W. Vaux, General Agent, Passenger Department, Union Pacific Rd., Chicago, and formerly of the G.T.R., acted as secretary of the local reception committee and did a lot of work in that connection, the other members of the committee being C. G. Ortenburger, G.W.P.A., Canadian Government Railways; R. H. Bell, G.A., Canadian Northern Ry.; G. A. Walton, G.A.P.D., Canadian Pacific Ry.; J. D. McDonald, A.G.P.A., Grand Trunk Ry.; C. C. Clark, G.A.P.D., Michigan Central Rd., and F. H. Tristram, A.G.P.A., Wabash Rd. The social features arranged for by the local committee included an automobile drive through the parks and boulevards, a tour of the elevated railways, a steamboat trip along the water front, an illustrated lecture on Pacific Coast routes and the San Francisco exhibition for 1915, and an inspection of the Chicago and North Western Ry.'s new terminal, with a luncheon in its restaurant. The ladies were entertained at a luncheon in the grill room of Marshall Field and Co.'s store and also to a theatre party, and the men had a smoker at the hotel headquarters.

Mr. Vaux issued a greeting folder for distribution to the members, having on its title page a facsimile of a Union Pacific Rd. annual pass issued in 1868 to Murray Anderson, President, London and Port Stanley Ry., London, Ont., and which is now in possession of his son-in-law, J. H. Flock, K.C., London, Honorary Counsel, C.T.A.A. Mr. Vaux also issued an historical circular containing a lot of interesting railway information. In recognition of his indefatigable efforts, the members of the association presented him and Mrs. Vaux with a silver cake basket.

Grand Trunk Railway Betterments, Construction, Etc.

Lachine, Jacques Cartier and Maisonneuve Ry.—Three appeals, arising out of awards by arbitrators in connection with the taking of land for the right of way of this projected railway, were disposed of in the Court of Review, Montreal, Oct. 8. Two of the appeals were made by the company, and one by the landowner. The three appeals, which were entirely on technical points, were dismissed. These decisions bring the construction period a little nearer.

Bonaventure to St. Henri.—The two new tracks authorized by the Board of Railway Commissioners to be laid between Bonaventure Station and St. Henri, Montreal, have been laid. Work was started immediately after the decision had been given, and completed in a few days.

Lindsay Terminals.—The Lindsay, Ont., Town Council was informed, Oct. 8, that the company was considering plans for the laying out of new terminals at that divisional point, but that it was impossible to state when the plans would be ready or when it would be possible to start work. (Oct., pg. 464.)

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

22560. Sept. 17.—Amending order 22495, Sept 3, re Erie and Ontario Ry. branches at Dunnville, Ont.

22561. Sept. 16.—Authorizing G.T. Pacific Ry. to build spur for Inverness Cannery at mileage 12.8 from Prince Rupert east, B.C.

22562. Sept. 16.—Authorizing G.T. Pacific Ry. to build highway between Secs. 34 and 35, Tp. 42, R. 1, w. 4 m., Alta., across its Butze gravel pit spur.

22563. Sept. 18.—Authorizing C.P.R. to operate interlocking plants at Murdock, at mileage 3.5, Winnipeg Beach Subdivision, and at mileage 3.6, Arborg Subdivision, Man.

22564. Sept. 18.—Authorizing C.P.R. and Canadian Northern Ry. to operate over interlocking plant at Woodman, Man.

22565. Sept. 17.—Approving Canadian Northern Ry. location in n.w. ¼ Sec. 19-2-6, w. 2 m., Sask., and authorizing it to take certain C.P.R. lands in n.w. ¼ Sec. 19.

22566. Sept. 17.—Amending order 22469, Aug. 29, re St. John and Quebec Ry. crossings of C.P.R. in Fredericton, N.B.

22567. Sept. 16.—Authorizing C.P.R. to build spur for Hewitt and Black, Ltd., Medicine Hat, Alta.

22568. Sept. 17.—Authorizing C.P.R. to build its ballast pit spur across two highways on its Moosejaw Southwesterly Branch, mileage 0.745 and 1.79.

22569. Sept. 16.—Authorizing C.P.R. to build spur for McDonald Construction Co., Calgary, Alta.

22570. Sept. 18.—Authorizing Canadian Northern Ry. to connect its Vegreville-Calgary Branch with C.N. Western Ry. Brazeau Branch at Warden, Alta.

22571. Sept. 19.—Authorizing Mission City Telephone Co. to erect its wires across C.P.R. at DeRoche, B.C.

22572. Sept. 17.—Approving Bell Telephone Co. agreement with Pelee Tp., Ont.

22573. Sept. 16.—Dismissing application of Town of Parry Sound, Ont., for reconsideration of order 4008, Nov. 26, 1907, and for order directing C.P.R. to build subway at Armstrong St.

22574. Sept. 16.—Approving revised location of Edmonton, Dunvegan and British Columbia Ry. through Tps. 76 and 78, R. 19 and 20, w. 5 m., Alta.

22575. Sept. 16.—Authorizing Edmonton, Dunvegan and British Columbia Ry. to build across 12 highways in Alberta.

22576. Sept. 16.—Authorizing Hydro-Electric Power Commission of Ontario to erect transmission line across C.P.R. wires and tracks at Goderich, near Meneset station, double poles to be erected on each side of railway.

22577. Sept. 16.—Authorizing Canadian Northern Ry., until May 1, 1915, to carry traffic over its Oakland Branch from mileage 42 to end of track, in Manitoba, 12 miles, speed limited to 12 miles an hour.

22578. Sept. 23.—Authorizing Dominion Atlantic Ry. to carry freight over its North Mountain Branch from Centreville to Somerset, 12.09 miles; speed limited to 12 miles an hour.

22579. Sept. 17.—Authorizing Quebec Oriental Ry. to build siding from its main line to Chaleurs Bay Mills, Mann Tp., Que.

22580. Sept. 21.—Authorizing C.P.R. to operate over bridges 81.0, 17.0 and 103.3, Sudbury Subdivision, Ont.

22581. Sept. 21.—Amending order 22446, Aug. 25, re certain grade crossings on C.P.R. Weyburn-Stirling Branch, Sask.

22582. Sept. 19.—Authorizing C.N. Ontario Ry. and Campbellford, Lake Ontario and Western Ry. (C.P.R.) to operate over crossing, in Lot 27, Con. 2, Pickering Tp., Ont., and interlocking plant, without first stopping trains.

22583. Sept. 17.—Authorizing C.N. Ontario Ry. to build across public road between Lots 20 and 21, Con. 7, mileage 204.48 from Ottawa, Chisholm Tp.

22584. Sept. 21.—Authorizing British Columbia Department of Public Works to build level highway crossing at station 546+05, Vancouver, Victoria and Eastern Ry. Phoenix Branch.

22585. Sept. 22.—Authorizing British Columbia Government to build highway over Great Northern Ry. at Hedley, old highway crossing east of station to be closed.

22586. Sept. 22.—Relieving G.T.R. from speed limitation of 10 miles an hour over crossing of James St., Brampton, Ont.

22587. Sept. 18.—Authorizing Toronto, Hamilton and Buffalo Ry. to build spur in Hamilton, Ont., from Grasselli Chemical Co.'s spur, with three spurs from same to connect with first named.

22588. Sept. 22.—Relieving G.T.R. from speed limitation of 10 miles an hour over crossing of Wilmot St., Berlin, Ont.

22589. Sept. 22.—Approving location of C. P.R. station at Pays Plat, Thunder Bay District, Ont.

22590. Sept. 22.—Approving C.P.R. clearances through rock house on Mond Nickle Co.'s spur at Worthington, Ont.

22591. Sept. 22.—Approving International Bridge and Terminal Co.'s Standard Freight Tariff, C.R.C. 1.

22592. Sept. 21.—Authorizing Niagara, St. Catharines and Toronto Ry. to build siding for G. A. Keyes, in Lot 4, Con. 1, Grantham Tp., Ont.

22593. Sept. 21.—Approving Kettle Valley Ry. location from mileage 69 to 70.15 west of Penticton, B.C.

22594. Sept. 21.—Authorizing Saskatchewan Board of Highway Commissioners to build ditch under Canadian Northern Ry. in s.e. ¼ Sec. 27-32-8, w. 2 m.

22595. Sept. 21.—Amending order 22545, Sept. 14, re highway crossing over G.T. Pacific Ry. north of Rutan siding, Sec. 22-35-27, w. 2 m., to be built by Saskatchewan Government.

22596. Sept. 18.—Authorizing G.T.R. to build two additional tracks across certain highways in Montreal.

22597. Sept. 16.—Approving C.P.R. clearances of structures on Oliver & Webster's sidings, mileage 91.4, Owen Sound Subdivision, Ont.

22598. Sept. 19.—Authorizing St. Marys Portland Cement Co. to receive $4,000 deposited in bank in St. Marys to the Board's credit.

22599. Sept. 23.—Approving location of Esquimalt and Nanaimo Ry. Co.'s station at Dashwood, B.C., mileage 105.1.

22600. Sept. 23.—Authorizing C.P.R. to open for traffic various revisions of line at points on Lake Superior Division, Ont.

22601. Sept. 23.—Amending order 13827, June 2, 1911, re Manitoulin and North Shore Ry. (now Algoma Eastern Ry.) subway crossing of C.P.R.

22602. Sept. 23.—Refusing application of City of Hamilton, Ont., for authority to extend Birmingham St. southerly to Toronto, Hamilton & Buffalo Ry. spur.

22603. Sept. 23.—Authorizing Algoma Central and Hudson Bay Ry. to open for traffic its line from Oba to earst, Ont., mileage 83 to 130.87.

22604. Sept. 24.—Authorizing City of London, Ont., to build storm sewer under G.T.R. at Colborne St.

22605. Sept. 24.—Authorizing C.P.R. to build its Moose Jaw Southwesterly Branch under Canadian Northern Ry. Swift Current Southeasterly Branch, at mileage 43.62, in Sec. 13-11-30, w. 2 m., Sask; C.P.R. to change design of foundations to satisfaction of C.N.R. should ground at bridge prove soft.

22606. Sept. 25.—Authorizing City of St. Boniface, Man., to build highway crossing over Canadian Northern Ry. at Archibald St.

22607. Sept. 23.—Approving Standard Freight Mileage Tariff, C.R.C. 23, effective Sept. 1, to apply between stations on Vancouver and Lulu Island Ry. and the Vancouver, Fraser Valley and Southern Ry. Co.

22608. Sept. 25.—Authorizing Ancaster Tp., Ont., to build grade crossing over Toronto, Hamilton & Buffalo Ry. on Emerson St., West Hamilton.

22609. Sept. 25.—Rescinding order 22069, June 25th, re G.T.R. siding for St. Marys Portland Cement Co., Blanshard Tp., Ont.

22610. Sept. 22.—Extending, to Nov. 30, time within which Campbellford, Lake Ontario and Western Ry. (C.P.R.) shall install automatic bell at crossing of Frontenac Road, Farham, Ont.

22611. Sept. 26.—Amending order 22536, Sept. 11, re extension of highway by Ops Tp., Ont., over Georgian Bay and Seaboard Ry. (C.P.R.) at mileage 9, Port McNicoll Subdivision.

22612. Sept. 23.—Ordering Quebec, Montreal and Southern Ry. to rebuild roadway on farm of M. P. Senneville, La Baie Parish, Que., within 30 days.

22613. Sept. 25.—Amending order 22512, Sept. 5, re C.P.R. clearances of gantry crane at Galt, Ont.

22614. Sept. 25.—Amending order 21368, Feb. 17, re operation of Kena Valley Ry. from Penticton wharf westerly for 17 miles, B.C.

22615. Sept. 23.—Relieving G.T.R. from providing further protection at crossing of public highway 1½ miles west of Lancaster station, Ont.

22616. Sept. 26.—Approving location of Glengarry and Stormont Rv. (C.P.R.) station and grounds at Glenbrook, Ont., mileage 20.23.

22617. Sept. 22.—Relieving G.T.R. from speed limitation of 10 miles an hour over crossing ½ mile north of Shallow Lake, Ont.

22618. Sept. 23.—Relieving C.P.R. from speed limitation at Herbert, Sask., as imposed by order 19500, May 29, 1913.

22619. Sept. 28.—Extending, to Oct. 31, time within which C.P.R. shall install gates at St. Maurice St., Three Rivers, Que.

22620. Sept. 28.—Authorizing Algoma Central and Hudson Bay Ry. and C.P.R. to operate bridge at crossing of C.P.R., Sault Ste. Marie, Ont.

22621. Sept. 30.—Authorizing Saskatchewan Board of Highway Commissioners to build road along south boundary of south ½ Sec. 11-26-7, w. 3 m., across Canadian Northern Ry.

22622. Sept. 30.—Approving G.T.R. clearances at platform on premises of Union Stock Yards of Toronto, south of St. Clair Ave. and west of Dods Ave.

22623. Sept. 29.—Approving location of Glengarry and Stormont Ry. (C.P.R.) station and grounds at mileage 9.05, Lancaster Tp.

22624. Sept. 29.—Authorizing Glengarry and Stormont Ry. (C.P.R.) to build at grade across highways at mileage 26.60, 26.72, 26.86 and 27.00, Cornwall Tp., Ont.

22625. Sept. 29.—Authorizing G.T.R. to build additional track across 18th Ave., Lachine, Que.

22626. Sept. 29.—Amending order 22541, Sept. 14, re C.P.R. ballast pit spur in Van Horne Tp., Ont.

22627. Sept. 28.—Authorizing Canadian Northern Ry. to build spur for the Slocum Howland Coal Properties and to divert certain highways in Secs. 9. 8 and 7, Tp. 29, R. 20, w. 4 m., Alta.

22628. Sept. 29.—Approving location of Esquimalt and Nanaimo Ry. flag stop shelter at Royston, B.C., mileage 135.9.

22629. Sept. 29.—Authorizing C.P.R. to open for traffic portions of double track from mileage 0.4 to 24.0 and 103.4 to 128.9, Shuswap Subdivision, and from mileage 0.5 to 8.7, Thompson Subdivision, B.C.

22630. Sept. 30.—Authorizing C.P.R. to build spur for Campbell, Wilson and Strathdee, Ltd., and alter trackage for Regina Cartage Co., Regina, Sask.

22631. Sept. 27.—Approving location of C.P.R. station in Tp. 36, Sudbury District, Ont., mileage 20.10, White River Subdivision.

22632. Sept. 21.—Extending express collection and delivery area in Swift Current, Sask., as fixed by order 20463, Sept. 30, 1913, and rescinding orders 20463, Sept. 30, 1913, and 22117, July 3, 1914.

22633. Sept. 21.—Recommending to Governor in Council for approval G.T. Pacific Ry. bylaw 16, respecting handling of public at stations and on trains.

22634. Sept. 28.—Authorizing Dominion Express Co. to refund to Edmonton City Dairy, Ltd., 5c. per can on all cream carried to Edmonton, Alta., and not delivered, and declaring Dominion Ex. Co.'s position with regard to such deliveries. This order is given more fully on another page under Among the Express Companies.

22635. Sept. 28.—Rescinding order 16874, June 26, 1912, in so far as it relieves C.P.R. from erecting fences on certain portions of its line in British Columbia.

22636. Sept. 21.—Extending for three months from date time within which G.T.R. shall complete siding for Pilkington Bros., Wainfleet Tp., Ont., authorized by order 22041, June 19.

22637. Sept. 28.—Authorizing G.T.R. to rebuild bridge carrying Victoria Ave., Niagara Falls, Ont., across its tracks.

22638. Sept. 28.—Authorizing C.N. Ontario Ry. to build bridge over Grand Lake Narrows, mileage 127.35 from Ottawa.

22639. Sept. 28.—Amending order 20207, Aug. 27, 1913, re building of road by Saskatchewan Government under Canadian Northern Ry. in s. w. ¼ Sec. 21-29-17, w. 3. m.

22640. Sept. 30.—Amending order 22515, Sept. 5, re C.N. Alberta Ry. Spur for Pembina Coal Co., near Entwistle, Alta.

22641. Sept. 30.—Relieving C.P.R. from speed limitation of 20 miles an hour over its Virden-McAuley Branch from mileage 13.5 to 36.0, Manitoba.

22642. Oct. 1.—Authorizing C.P.R. to revise location of spurs built for Fort William Starch Co., Ltd., in Lots 6 and 7, Con. D, Island no. 2, Fort William, Ont., and to build extensions to them.

22643. Oct. 1.—Authorizing Canadian Northern Ry. to build spur track to mileage 1.93, Birds Hill Branch, for Cusson Lumber Co., Ltd., in Transcona, Man.

22644. Oct. 1.—Amending order 22292, July 28, re rate on sand and gravel from Clover Bar to Edmonton, Alta.

22645. Sept. 30.—Authorizing Michigan Central Rd. and New York Central Rd. to use storm window in front of cabs, shown on plans filed.

22646. Oct. 1.—Directing C.P.R. to stop its train 211, which passes Highlands, Que., at 8.48 p.m., inbound, on flag, for a trial period of two months, company to keep record of number of stops and traffic at this point.

22647. Oct. 1.—Directing that C.P.R. make cattle pass on A. G. Waite's property, Streetsville, Ont., 6 ft. high and 6 ft. wide in clear, and that level crossing there be constructed in accordance with Standard Regulations, work on level crossing to be completed within 30 days and on cattle pass within 60 days.

22648. Oct. 1.—Authorizing Canadian Northern Western Ry. to join its Brazeau Branch with Alberta Central Ry., in Sec. 22-39-7, w. 5 m., Alberta.

22649. Sept. 30.—Rescinding order 22055, directing G.T.R. to establish train service on Haliburton Subdivision.

22650. Sept. 30.—Authorizing Canadian Northern Ontario Ry. to take for purpose of carrying out provisions of order 22056, June 24, portions of Lots 78 and 80, St. Eustache Parish, Que., property of F. X. Boileau.

22651. Oct. 2.—Amending order 22112, July 3, dismissing Canadian Northern Ry. application for repeal of order 20808, Nov. 13, 1913, re diversion of Rue La Verandrye, St. Boniface, Man.

22652. Sept. 30.—Approving agreement between Bell Telephone Co. and Burnt River Telephone Co., Ltd., Sept. 16, and rescinding order 8238, Oct. 5, 1909, in so far as it approved agreement between Bell Telephone Co. and Burnt River Telephone Co., dated June 2, 1909.

22653. Oct. 1.—Authorizing Erie and Ontario Ry. to build bridge across Welland River at mileage 7.95 from Smithville.

22654. Oct. 2.—Amending order 22091, May 26, re charges on cordwood from Richan, Ont., to Winnipeg.

22655. Oct. 2.—Authorizing C.P.R. to operate bridge 45.8, McAuley Subdivision, and 84.55, Bredensbury Subdivision, Manitoba Division.

22656. Oct. 1.—Relieving C.P.R. from erecting and maintaining fences along its right of way between Sudbury and Port Arthur, Ont.

22657. Oct. 2.—Approving C.N.R. Standard Freight Mileage Tariff, to apply between stations on its lines east of and including Westford, Ont., superseding C.R.C. no. E. 212 previously approved.

22658. Oct. 2.—Authorizing C.N.R. to build spur for Worswick Paving Co., in Lots 12 and 13, Block 26, Edmonton, Alta., subject to conditions of consent of Edmonton City Commissioners.

22659. Oct. 1.—Directing G.T.R. forthwith to employ watchman at crossing of public highway just east of Seaforth station, Ont., between 7 a.m. and 7 p.m.; wages to be paid 20% by town and remainder by company.

22660. Oct. 2.—Limiting to 6 miles an hour speed of all trains operated over Grand Trunk Pacific Ry. along Empire Ave., Fort William Ont., from intersection of Syndicate Ave. to Canadian Northern diamond.

22661. Oct. 2.—Approving revised arrangement of interlocking plant at crossing of G.T.R. by Ottawa and New York Ry. at Cornwall Jct. Ont.

22662. Oct. 3.—Amending order 22587, Sept. 18, by authorizing Toronto, Hamilton and Buffalo Ry. to build spur in Hamilton, Ont., from Grasselli Chemical Co.'s spur, by authorizing G.T.R. to operate the same jointly.

22663. Oct. 2.—Authorizing Glengarry and Stormont Ry. to operate, for construction purposes only for 30 days after installation of diamond, over crossing of G.T.R., near Cornwall, Ont.; provided trains be brought to a stop and flagged over crossing by watchman appointed by G.T.R. at expense of G. & S.R.

22664. Oct. 6.—Directing that G.T.R. publish and file, with concurrence of Michigan Central Rd., rates on cobble, crushed, field, or rubble stone in carloads, of minimum weight of 60,000 lbs., from Windmill Point siding to stations on its line and on M.C.R., effective not later than Oct. 15.

22665. Oct. 5.—Approving revised location of Lake Erie and Northern Ry. from Bruce St., Galt, Ont., to connection with C.P.R. on north side of Main St.

22666. Oct. 5.—Authorizing Public Works Department of Alberta to build highway in Sec. 4-18-13, w. 4 m., across C.P.R.

22667. Oct. 3.—Rescinding order 21413, Feb. 27, 1914, suspending tariffs filed by certain railway companies, requiring additional railway tickets for exclusive use of drawing rooms or compartments in sleeping and parlor cars, the companies having complied with general order 130.

22668. Oct. 5.—Amending order 22550, Sept. 12, 1914, authorizing C.P.R. to alter spur for McCormick Mfg. Co., London Tp., Ont.

22669. Oct. 3.—Authorizing C.P.R. to build road diversion in N.W. ¼ Sec 24-2-9. w 2 m., Sask.; and build Estevan-Forward Branch across it at mileage 4.65, at grade.

22670. Oct. 5.—Authorizing C.P.R. to carry third track of main line, Moose Jaw Subdivision, across 9th Ave., Broadview, Sask., on a bridge.

22671. Oct. 6.—Approving C.P.R. plan showing Standard 2A locomotive house.

22672. Oct. 6.—Rescinding order 22392; and directing that G.T.R. build spur connecting with its westbound main track, West Flamboro Tp., Ont., subject to certain conditions.

22673. Oct. 5.—Authorizing G.T.R. to build siding for Pilkington Bros., N. ½ Lot 48, Con. 1, North Cayuga Tp., Ont.

22674. Oct. 5.—Authorizing Great Northern Ry., operating V.V. & E. Ry. & Nav. Co., to discontinue for present year suburban service required to be put into effect by order 18870.

22675. Oct. 5.—Amending order 22346, July 21, re New York Central Rd. stopping certain trains at Adirondack Jct.

22676. Oct. 5.—Approving location Canadian Northern Manitoba Ry. through Tp. 28, and Rgs. 8-10, w.p.m., Man.

22677. Oct. 5.—Approving Campbellford, Lake Ontario and Western Ry. (C.P.R.) plan of galvanized iron fence to be erected from north end of Lot 183 to south end of Lot 179, Bowmanville, Ont.; provided fence be painted.

22678. Oct. 6.—Authorizing C.P.R. to build at grade, tracks of legs of wye across Railway Ave. West, Gowanlock, mileage 308 on Weyburn-Stirling Branch.

22679, 22680. Oct. 5.—Authorizing G.T.R. and Lake Erie and Northern Ry. to operate trains over crossing between Paris and St. George, Ont., at station 538-16.9, and over crossing of G.T.R. by Lake Erie and Northern Ry. at Paris, Ont.

22681. Sept. 25.—Authorizing Kettle Valley Ry. to carry traffic on its line from mileage 17 to 40.9, west of Penticton, B.C.

22682, 22683. Oct. 7.—Authorizing C. P. R. to operate over bridges 27.67 and 65.89, Edmuston, Subdivision, N. B., and over bridges 14.7 and 18.7, Emerson Subdivision, Man.

22684. Octr. 8.—Ordering G. T. R., within 30 days to rebuild fence along right of way on property of J. Lawson, Maple Lake, Ont., between mileage 377 and 378.

22685. Octr. 6.—Approving revised location of G. T. Pacific Ry. from Lot 415 into Lot 731, mileage 235.57 to 256.10 R. 5, Coast District, B.C.

22686. Octr. 6.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) and G. T. R., to operate over crossing in Whitby, Ont., without first stopping trains.

22687. Octr. 6.—Approving G. T. Pacific Ry. revised location from Lot 4149 into Lot 3577, mileage 332 to 340.88, Prince Rupert East, R. 5, Coast District, B. C.

22688. Octr. 6.—Ordering that all Michigan Central Rd. train movements on siding to Dominion Chain Co., be flagged across Bender St., Niagara Falls, Ont.

22689. Octr. 5.—Approving Lake Erie and Northern Ry. location in Galt, Ont., from station 1135+50 to 116+30.7, and authorizing it to use C. P. R. right of way from station 1160+78.5 to connection with C. P. R. at station 2921+40, and connect with its own tracks at last mentioned point and authorizing it to use C. P. R. between stations 1114+76.3 and 1135+50, Galt, embankments to be sodded and kept in good condition, opening to be built through embankment to provide approach to park from Beverly St., at a point to be approved by the Board and suggested by Galt Park Commissioners.

22690. Octr. 8.—Approving G. T. Pacific Ry. revised location from Lots 4287 to 5341, mileage 289.24 to 316.26, Prince Rupert East, R. 5, Coast District, B. C.

22691. Octr. 9.—Ordering that grade of highway and railway were C. P. R. crosses Yonge St., North Toronto, be separated by means of a subway for highway traffic, and authorizing City of Toronto to widen Yonge St. there from 66 to 86 ft.; additional strip to be taken on east side of street; city to compensate company for portion of its lands taken; subway to have 18 ft. headroom; all work in connection with subway, except that affecting water pipes, sewers, sidewalks and pavements, to be done by company, city to pay additional cost of subway as provided for herein; all disagreements to be settled by the Senior Judge of York County, who is appointed arbitrator; and rescinding orders 16842, 16846, and 17390 in so far as they are inconsistent with this order.

22692. Octr. 6.—Authorizing G. T. Pacific Branch Lines Co. to build its Salter gravel pit spur across highways between Secs. 28 and 27, and 27 and 26-38-16, w.3.m. Sask.

22693. Octr. 6.—Authorizing G. T. R. to build extension of siding for Ontario Government near Mimico, Ontario.

22694. Octr. 9.—Extending to Dec. 31, time within which C. P. R. shall complete spurs at mileage 2.26, Muskoka Subdivision, Ont., Lot 1, Con. 4, west of Yonge St., York Tp., on Canadian Kodak Co.'s land.

22695. Octr. 6.—Authorizing Erie and Ontario Ry. to divert highway through Lot 4, Con. 2, and Lot 5, Con. 3, Gainsboro Tp., Ont.

22696. Octr. 6.—Approving Halifax and South Western Ry. bylaw authorizing General Freight and Passenger Agent to issue passenger and freight tariffs.

22697. Octr. 9.—Ordering G. T. R. to maintain speed limitation of 10 miles an hour on all southbound trains over crossing of Norfolk St., near Simcoe, Ont.

22698. Octr. 7.—Ordering C. P. R. within 30 days to lower drain under its Guelph and Goderich Branch, on J. Denholm's farm, Blyth, Ont., by 18 inches.

22699. Octr. 9.—Ordering C. P. R. to install gates at crossing of McLennan Ave., North Toronto, Ont., to be operated by day and night watchmen; one third of cost to be paid by C. P. R. and the balance by the City of Toronto.

22700. Octr. 9.—Relieving C. P. R. from speed limitation of 10 miles an hour over crossing between Lots 34 and 35, Con. 6, Scarboro Tp., just east of Wexford station, Ont.

22701. Octr. 10.—Authorizing Lake Erie and Northern Ry., to connect with Toronto, Hamilton and Buffalo Ry. in Brantford, Ont.

22702. Octr. 9.—Authorizing C. N. Ontario Ry. and C. P. R. to operate temporarily, pending construction of alterations in interlocking plant, over crossing near Hurdman's Bridge, Nepean Tp., Ont., trains to be flagged over crossing.

22703. Octr. 13.—Amending order 22665, Octr. 5, re Lake Erie and Northern Ry. location in Galt, Ont.

22704. Octr. 13.—Authorizing C. P. R. to build spur for Reliance Moulding Co., in Lot 5, Con. west of Great Cataraqui, Kingston Tp., Ont.

22705. Octr. 13.—Approving Halifax and South Western Ry. standard mileage tariff of maximum tolls. C. R. C. no. E-1, to apply on merchandise rates on express lines east of Windsor and Sudbury, Ont.

22706. Octr. 10.—Authorizing C. P. R. to make alterations and additions to spurs for Western Canada Flour Mills Co., Calgary, Alta.

22707. Octr. 10.—Authorizing C. N. Quebec Ry. and C. P. R. to operate over crossing at L'Epiphanie, Que., without first stopping trains.

22708. Octr. 13.—Authorizing C. P. R. to connect its spur to Frontenac Floor and Tile Co., Kingston, Ont., with G. T. R. spur.

22709. Octr. 14.—Authorizing Kettle Valley Ry. to build across certain highways in Hope, B. C.

22710. Octr. 13.—Ordering G. T. R. by May 1, 1915, to install gates at crossing of Ottawa St., Hamilton, Ont., to be operated by day and night watchmen; 20% of cost to be paid by the railway grade crossing fund, cost of maintenance and operation to be paid half each by City of Hamilton and company.

22711. Octr. 13.—Authorizing Lake Erie and Northern Ry. to build bridge across Grand River, Brantford, Ont.; Toronto, Hamilton and Buffalo Ry. grade a short distance west of the bridge not to be disturbed.

22712. Octr. 14.—Ordering C. N. Ontario Ry. to improve road at crossing between Cons. 4 and 5, Portland Tp., either by tearing down old west abutment and making easy turn in road, or by carrying road straight down hill from new subway; work to be completed by Decr. 1.

22713. Octr. 15.—Relieving C. P. R. from maintaining agent at Spillimacheen station B. C, until earnings there amount to $15,000 a year, as provided in general order 54, Jan. 6, 1910.

22714. Octr. 16.—Amending order 22697, Octr. 9, re speed limitation of G. T. R. trains near Simcoe, Ont.

22715. Octr. 16.—Extending for two months from date time within which G. T. R. shall complete building of highway over its line in Tay Tp., Ont., required under order 22344, Aug. 5.

General Order 132. Oct. 2.—Directing railway companies to restore, effective Sept. 1, 1914, arrangements whereby mixed carloads of groceries, classifying 5th class in straight carloads, and dried fruits, classifying 4th class in straight carloads, also foreign and domestic liquors in mixed carloads, were carried in each case at the carload rates applicable to each commodity respectively, to destinations west of and including Port Arthur, Ont.

Railway Situation in Saskatoon.—A plan was submitted for consideration to the Saskatoon, Sask., City Council, Oct. 18, upon the railway situation in the city. The plans accompanying the report showed the routes of the C.P.R., the C.N.R., and the G.T.P. Ry. now entering the city, and the suggested improvements. The report suggested the building of an elevated railway through the city, with which all the lines would be connected, the erection of a central passenger and freight station, and the laying out of freight yards at the north east and south west sides of the city. It is suggested in the report that any other railway seeking an entrance into Saskatoon should be connected with the elevated line.

Frauds by C.P.R. Conductors.—Eleven C. P.R. conductors were, at Toronto, Oct. 22, each fined $200, or three months imprisonment, two other employes were sentenced to two months imprisonment, two fined $50 and one allowed out on suspended sentence, for practising fraud on the company, in connection with a short fare business between Toronto and Sudbury. In connection with the same series of charges, an information clerk at the C.P.R. city office, Toronto, was sentenced to two months imprisonment, a sleeping car conductor to one month imprisonment, and two outsiders were fined $50 each, and one allowed to go on suspended sentence.

Ralph Lund, Storeman, Grand Trunk Pacific Ry., McBride, B.C., writes: "I am very much interested in the issues of Canadian Railway and Marine World, as I receive them from time to time."

Electric Railway Department

Electric Equipment for the London and Port Stanley Railway.

As mentioned in Canadian Railway and Marine World for September, rapid progress has been made in the renovation of the London and Port Stanley Ry., and track laying and reballasting are nearly completed by the Pere Marquette Rd., which has been operating the line for some years, under lease from the owner, the city of London. The city's interests were recently transferred to the London Railway Commission, and this body has arranged with the P.M.R. for a continuation of its services, pending the completion of the electrification. The engineering phases of the electrification are being developed by the engineering staff of the Hydro-Electric Power Commission of Ontario in its railway department, under F. A. Gaby, Chief Engineer.

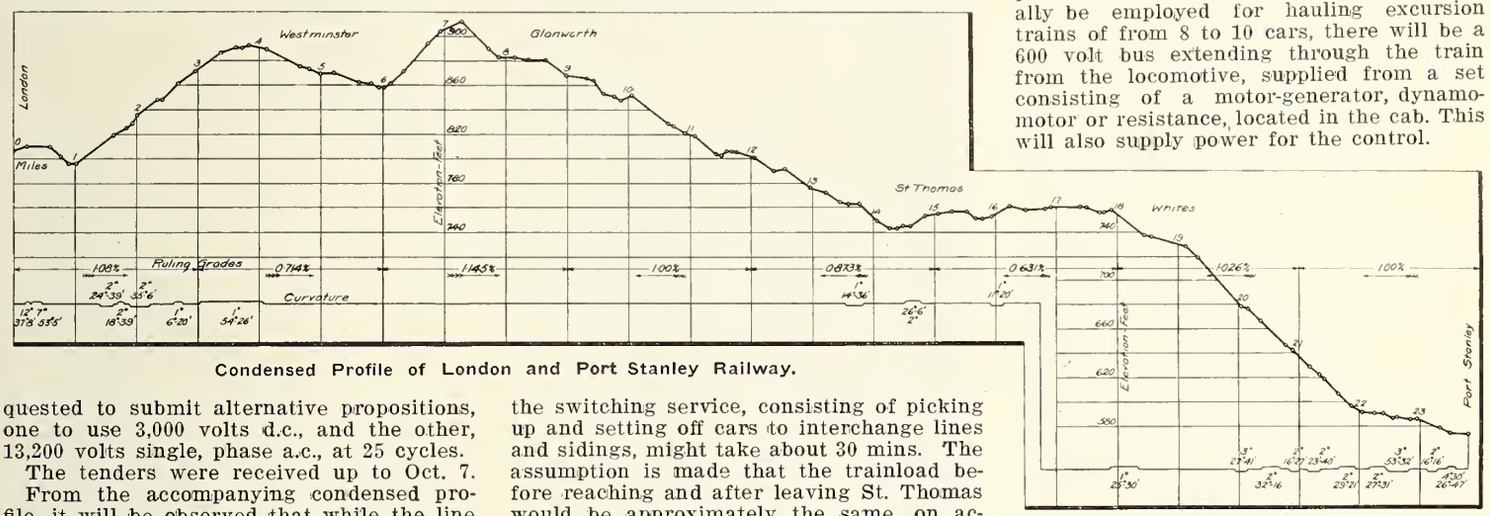
Complete specifications have been prepared for the initial installation of electric locomotives, cars and trailers, and while specifically calling for 1,500 volt d.c. equipment, the tendering manufacturers are requested to submit alternative propositions, one to use 3,000 volts d.c., and the other, 13,200 volts single, phase a.c., at 25 cycles.

The tenders were received up to Oct. 7.

From the accompanying condensed profile, it will be observed that while the line is very short, slightly under 24 miles, the gradients are heavy, presenting a condition that is quite generally conceded to be better adapted to electrical than to steam operation. In developing the electrification scheme, the engineers have been materially guided by the existing traffic conditions. A considerable increase in traffic may be expected, especially in the number of passengers carried, as the nature of the district through which the line passes is such that a frequent service, which would prove unprofitable with steam operation, would increase the travel habit of the people in the district traversed.

Freight Traffic. — The freight traffic consists chiefly in hauling loaded coal cars from Port Stanley to St. Thomas and London, a car ferry, operating over 10 months in the year, delivering the cars to the line from the Pennsylvania coal fields across Lake Erie. Some additional traffic, consisting principally of loaded coal and merchandise cars, is delivered to the line at St. Thomas for London, being interchanged from the G.T.R., Michigan Central Rd., and the Pere Marquette Rd. The traffic from London to St. Thomas consists of loaded merchandise cars, and empty coal cars, while between St. Thomas and Port Stanley it consists almost entirely of returning empty coal cars for delivery to the car ferry. This ferry has a capacity of 30 cars on its four tracks, the two central tracks holding 8 cars each, and the outer two 7 cars each. It can make two round trips a day, delivering to the line 30 loaded cars, and taking away 30 empties, each trip. The Port Stanley switching yard is practically level, and is approximately 1,000 ft. long.

For the purpose of specifying the capacity of the locomotives it has been assumed that the traffic will be handled in 800 ton trains, and that certain periods of time would be desirable in handling the switching and interchange at points along the line. For instance, immediately after unloading and reloading the ferry, the locomotive would be required to classify the cars and make up the train in an approximate time of 45 mins., the maximum train to be moved being assumed at 15 loaded cars of 70 tons each. After this Port Stanley yard switching, the locomotive would haul the assumed loading of 800 tons up grade to St. Thomas, with power to stop and start again at Whites, where a car might be passed. In St. Thomas the switching service, consisting of picking up and setting off cars to interchange lines and sidings, might take about 30 mins. The assumption is made that the trainload before reaching and after leaving St. Thomas would be approximately the same, on account of the balance between the freight dropped off and the London interchange from the connecting railways. Stops might be required at Glanworth and Westminster, and on arriving in London the cars would be distributed to the various sidings, and a train made up for the return trip, consuming possibly an hour.



Condensed Profile of London and Port Stanley Railway.

Locomotives.—To handle this assumed service tenders have been invited for three locomotives, each to weigh approximately 60 tons, capable of developing a maximum speed of about 25 m.p.h. on 1,400 volts, when hauling an 800 ton train on a level track; and further, capable of making the run from Port Stanley to Whites, the heaviest section of the line, with an adverse grade approaching 1% nearly all the way, in 23 mins. A maximum safe speed of 45 m.p.h. is specified. Each locomotive must be capable of accelerating an 800 ton train on a 1% grade with a clean, dry rail, and be able to develop a drawbar pull for a 5 min. period corresponding to a 35% adhesion.

Each locomotive will consist of two 2-axle trucks, supporting a platform and box type cab structure, with all the weight on the driving wheels. The cab platform will consist of structural steel girders and cross beams rivetted to steel plates, which form the cab floor. The sides and roof will be of sheet steel, reinforced by structural steel framework. Cast steel bumpers with push pole pockets will be provided. In the cab there will be a master controller, air brake valves and all other equipment and meters to provide for complete double end control. Wooden floors will be laid in the operating sections of the cab.

The locomotive trucks will be of the swivel type, each with two driving axles and outside journals, and so designed as to be able to operate as single units without load on curves of 50 ft. radius. The wheels will have steel centres and M.C.B. rolled steel tires. The couplers are also to be M.C.B. standard.

Interpole motors, wound for a normal operating voltage of 1,500, will be used, and the locomotives will be furnished with double and non-automatic multiple unit control, so arranged that at least three locomotives may be operated as a unit from either end of any one, with provision for connecting the four motors of each locomotive in full series, series parallel and full parallel. As the locomotives will occasionally be employed for hauling excursion trains of from 8 to 10 cars, there will be a 600 volt bus extending through the train from the locomotive, supplied from a set consisting of a motor-generator, dynamotor or resistance, located in the cab. This will also supply power for the control.

Two pantographs per locomotive, preferably of the pneumatic type, will be arranged for operating from either operative position when operating singly or in multiple, each with a separate cut out to render inoperative any pantograph as desired. The normal trolley height will be 23½ ft. above the top of rail, with maximum and minimum heights of 24 and 16 ft., respectively.

The locomotives will be equipped for combined straight and automatic air brake operation, supplied from two motor driven air compressors, controlled from a governor, each compressor with a capacity of 40 cu. ft. of free air per min. at 110 lbs. per sq. in. The motors will be wound for 1,500 volts, but will also stand short periods of operation at 600 volts. The sanders will be pneumatic, with pipes leading to each of the leading driving wheels, and so arranged that the front and rear sand boxes may be operated independently of each other. They will have a capacity of 5 cu. ft. per pipe.

Passenger Traffic. — The passenger traffic on this line during the four summer months is very heavy, with the handling of the crowds to and from the beach at Port Stanley, while at other seasons of the year it is comparatively light. It is the present plan to handle it with 6 motor cars, with 6 trailers for use when the traffic demands. For the purpose of specifying the requirements of these 12 cars it has been assumed that during the summer an alternate limited

and local service might be furnished between London and Port Stanley from 6 a.m. to midnight, the limited trains making stops at the station, the G.T.R. and M.C.R. crossings in St. Thomas, and at such other points as are necessary for passing trains, the local trains making the same stops in St. Thomas, with a possible extra stop on the average of every two miles. During other seasons of the year when the traffic is light, hourly local trains might be run, with limited trains during the rush periods only.

For the purpose of specifying the possible requirements of the line an assumed schedule was developed. Limited trains, consisting of motor car and trailer, making the southbound trip in 47 mins., with an 8 min. layover at Port Stanley, and returning as a local in 58 mins., with a 7 min. layover in London, will make a round trip in two hours. Similarly local trains, travelling southbound in 53 mins., laying over 7 mins. at Port Stanley, and returning to London as a limited in 51 mins., with a 9 min. layover there, will also make the complete round trip in two hours. The maximum safe speed required would be 70 m.p.h.

PASSENGER CARS.—Tenders have also been asked for 6 motors cars and 6 trailers. They will be of the double truck type, about 55 ft. long over the knuckles, of steel construction, with an arched roof. The seating capacity will be 60. The motor cars complete, without the electrical equipment, will weigh about 56,000 lbs., while the trailers, of similar size and design, will weigh about 50,000 lbs. Both kinds of cars will have smoking compartments, and some will have baggage compartments.

The trucks will be of the 4 wheel type, with outside journals, and will have 36 in. wheels at 87 in. centres, with inside hung brakes. These trucks will be capable of operating at slow speed on curves of 40 ft. radius. The motor equipment of the motor cars will consist of four interpole, nose supported on a cross beam supported by springs, and designed for normal operation, two series, at 1,500 volts d.c. They will be geared for a free running speed of about 55 m.p.h., when operating without a trailer, on a level track at 1,400 volts, and will be able to meet the requirements outlined in the assumed timetable before mentioned. They will be capable of operating at reduced speeds on 600 volt circuits when necessary.

The motor cars will be furnished with double end non-automatic multiple unit control, so arranged that at least three motor cars may be operated as a unit from either end of any car. Pantographs, two per car, of the same construction and operation as those on the locomotive, will be used.

The brake equipment will allow of 8 motor or trailer cars being operated as one train. Each motor car will be equipped with an air compressor, governor, reservoirs, brake cylinder, valves, etc., for combined straight and automatic air brake operation with double end control, the automatic feature being of the variable release control. Each compressor will have a capacity for 25 cu. ft. of free air per min., delivering against a reservoir pressure of 100 lbs. per sq. in. Electro- pneumatic sanders will be furnished for each end of the motor and trailer cars, to be controlled from either end of the car.

Overhead Construction and Stations.—Under the present plans it is proposed to have two substations, one at London containing two 500 k.w. 1,500 volt. d.c. rotary converter units, and the other at St. Thomas, containing two or three similar units. The overhead construction will probably be of the side bracket type with catenary suspension, the pole spacing to be approximately 150 ft. on the tangents, with somewhat closer spacing on curves. The contact wire will be 4-0 grooved trolley wire, the feeder system consisting of a 4-0 feeder from the London substation for 3 miles towards St. Thomas, a 4-0 from St. Thomas substation to Glanworth, and a 1,000,000 c.m. feeder from the St. Thomas substation to mileage 23.4. All the apparatus will be designed to operate successfully on voltages varying from 50% below normal to 15% above.

Consideration of the Toronto Railway's Service.

The report made to the Ontario Railway and Municipal Board in May, by C. R. Barnes, assisted by J. H. Cain and J. M. Campbell, on a survey of traffic requirements in Toronto and the service furnished by the Toronto Ry., which was summarized in Canadian Railway and Marine World for July, contained a number of recommendations which have been under the Board's consideration at several sittings. The Board decided that G. R. Geary, K.C., City Counsel, should prepare a draft of an order based on the matters agreed upon between counsel for the city and the company and upon those already decided by the Board, that this draft be submitted to the Toronto Ry.'s counsel for approval, and if the two counsel could not agree on the form of the order it would be settled by the Board.

We were officially informed Oct. 16, that the draft for an order had been submitted to the Board and that it dealt with the following matters:—The building of a line on Teraulay St. from Agnes St. to College St., including the placing of the road in a proper condition for vehicular traffic; this to be done by Nov. 1, 1914; the addition of metal troughs of an approved type on the trolley wires by Jan. 1, 1915, for the protection of grade crossings of steam tracks; the installation of a modern heating apparatus in all cars used for winter service; the equipment of all new cars with passenger push buttons; the improvement of methods of operation at Dundas St. barn; the improvement of method of operation in respect to cars passing other cars while passengers are being discharged from the latter; persons riding in front vestibules with motormen; motormen starting cars without signals from conductors; conductors announcing streets; passengers leaving by front door as far as practicable; passengers standing in rear vestibules when there are vacant seats in car; stationing inspectors at important transfer points; the equipment of all cars with a legible route sign on the righthand side and a destination sign on the front end properly illuminated during hours of darkness; and to cause the platforms on 34 of the cars referred to in the report to be lengthened so that they shall be 6 ft. in length, inside measurement, and that the steps on such cars shall be reconstructed in accordance with such report.

The British Columbia Electric Railway's General Manager, Mr. George Kidd, is hopeful of a turn in business conditions for the better. In an interview recently he said: "I look forward with confidence to the prospects for business in the future, and believe that the present temporary halt in the development of the west will in the end prove very beneficial to all concerned, as it will give us an opportunity to thoroughly overhaul our various undertakings preparatory to the further development which we believe will take place at no distant date, and should be very materially assisted by the increase in trade which we all hope Canada will enjoy on the termination of hostilities in Europe."

Answers to Questions on Electric Railway Topics.

Following are two questions on electric railway topics, sent to the American Electric Railway Association's question box, recently, with replies thereto by W. F. Graves, Chief Engineer, Montreal Tramways Co.:—

Street Sprinkling. What material or composition is there which can be substituted for water in the sprinkling of streets paved with brick or medina, and which will eliminate the use of water in such large quantities as to injure the track and pavement? One of the big oil companies manufactures light road oil for the purpose of laying the dust on macadam pavements and it is very successful, but I do not know whether it would be desirable to use it on brick or medina pavements.

Ties. What is the actual bearing area of a wooden tie on crushed stone or gravel ballast with ordinary tamping? This area, of course, would vary with the different sizes of stone or kind of material. Is any data available from which actual figures may be furnished? I do not know of any data available covering bearing area of a wooden tie on ballast. The American Railway Engineering Association has been investigating this matter in connection with a recommendation covering the depth of ballast since 1913, and the report, when completed, should give some very valuable information.

Increased Operation of Toronto Civic Car Line Refused.

A deputation asked the Toronto City Board of Control recently that all cars on the civic line on Danforth Ave. be operated through to the city limits, except in the rush hours. The request was referred to the Commissioner of Works, who reported that the present service is adequately handling the traffic received, and that an increased service would be an unjustifiable operating extravagance, which would add to the present deficit, this being borne by the general ratepayers. Data of travel on the Danforth Ave. line shows that only 35% of the patrons travel east of Greenwoods Ave., this district being also served by the Gerrard St. line. Approximately 4,500 citizens, to be served by the Danforth line, live east of Greenwoods Ave., and 18,000 live west of it. The following table, compiled from three days' traffic count, shows the average number of through passengers per car on Danforth Ave. for certain periods of the day:—

	From East to Greenwoods.	From Greenwoods to East.
7 a.m. to 10 a.m. ...	19.1	8.7
10 a.m. to 5 p.m. ...	17.1	15.9
5 p.m. to 7 p.m. ...	40.7	55.0

The average number of passengers per car on the through Danforth service for the 12 hours, 7 a.m. to 7 p.m., at Greenwoods Ave., east bound, is 21.3, and west bound, is 20.2. During the lightest hour period of travel during the day, these figures drop to 7.6 and 11.5, or, if the service was given as the deputation asked for, there would be only 5.1 and 7.7 pasengers per car, respectively. If an equal service were given over the whole of the Danforth route, operating expenses to serve the people east of Greenwoods avenue would be 66 2-3% of the total cost, this district supplying only 35% of the passengers and revenue.

Niagara Falls, Ont., women collected fares on the local electric cars on Oct. 3, the collections being donated to the Canadian Patriotic Fund.

Application of Standard Code of Train Rules on Electric Interurban Railways.

By Allan Purvis, Manager Interurban Lines, British Columbia Electric Railway Company.

The adoption of uniform code of train rules on interurban railways has been the subject of committee reports and discussions at various conventions of the American Electric Railway Association, but without any definite conclusion having been arrived at. It has been stated that local conditions must govern in this respect, because many interurban lines operate what might be termed "suburban service" on a very much closer headway than the former, and the placing into effect of rules which would be applicable to the former could not be properly carried out on the latter.

A code of rules based on the principles of the Standard Code, adopted by the American Railway Association, would effect a more uniform knowledge of train service, thereby training men to one general idea or system. When, at a later period, men of this type would find employment with other companies, their experience and training would prove a source of revenue and safety, rather than a handicap, as under the present methods, which lead to involuntary violations, and a rule, no matter how insignificant, cannot be successfully violated, it sooner or later will result in disaster. I mean by this, that interurban railways should always be manned by men of experience, if possible, and it is the general practice in hiring men for train service that they have had some knowledge in train rules. If such men are obtainable, who have worked on other railways, the system of train rules with previous companies may be altogether different from the train rules in force on the line he is applying for work on. In such cases it may result in accidents, as confusion of different rules would probably lead to it.

The American Code of Interurban Train Rules is a step in the right direction, but still the same confusion might occur in the mind of a man, say, who had been working on steam railways under the Standard Code, entering electric interurban service. The rules materially differ from each other in the essential features, and while the Standard Code would not be adopted in its entirety, with one or two deviations from it, it could, in my opinion, be adopted successfully.

The British Columbia Electric Ry. Co. is, I believe, the pioneer in this respect, as the Standard Code of Train Rules, approved by the Dominion Railway Board and the Province of British Columbia, was adopted and has been in successful operation on its interurban lines since Mar. 1, 1911. The daily service on these lines is 477 scheduled trains during a period of from 5 a.m. until 12.30 a.m.—operation covers 7½ minutes to approximately a three hour headway—on one branch a 7½ and 15 minute service is in operation, a total of 208 trains. Prior to the adoption of the Standard Code of Rules referred to, some doubt existed as to the applicability of them——where an infrequent schedule was maintained no difficulty presented itself, but with a close headway of 7½ minutes it was deemed necessary to make a slight change, in order to cover this feature, without departing to any great extent from the strict interpretation of the Standard Code.

It must be admitted that delays are preferable to accidents, but actual experience has proven that delays do not occur so frequently, nor are they of such duration, since trains are operated in strict accordance with the Standard Code of Rules and on time schedules as they were previous to such time. Minor changes in the wording of the Code to suit local conditions may be made without in any way altering the general principle of safety. A deviation was made in the matter of flagging, Rule 99. The Standard Code reads as follows:—

(a) In day time, if there is no down grade toward train within one mile of its rear, and there is a clear view of its rear 2,000 yards (40 telegraph poles) from an approaching train.	500 yards 10 telegraph poles.
(b) At other times and places, if there is no down grade toward train within one mile of its rear.	1,200 yards 24 telegraph poles.
(c) If there is a down grade toward train within one mile of its rear.	1,800 yards 36 telegraph poles.

P401 Allan Purvis,
Manager, Interurban Division, British Columbia Electric Railway.

The rule as amended to conform to electric interurban operation is as follows:—(a) Distance the same. (b) Eliminated entirely. (c) 3,000 ft.

In suburban service, where stops are frequent, the continuous acceleration does not exceed 25 miles an hour, therefore the distance for flagging is considered ample. In frequent and isolated service, where train operation is adopted under the multiple unit system, motormen have the reverse feature in addition to quick action of their air brakes, which enables a stop to be made within the limits of safety. In this instance only have the essential features of the Standard Code been amended, the other rules have been successfully carried out without any appreciable delay in train operation.

During very foggy, and other stress of weather, in the operation of heavy suburban service, one minute fusees have been adopted—these fusees are used when a station stop is to be made and before reaching such station. The one minute fusee allows for ample immediate rear end protection and also eliminates any delay in maintaining the running schedule, any other delays whatsoever, Rule 99 governs absolutely. The above illustration of the minute fusee is given to indicate that although such rules can be placed into successful operation, although not covered by the Standard Code, Rule 99, has not in any way been affected by it.

The terminal clearance in double track

BRITISH COLUMBIA ELECTRIC RAILWAY CO.

Date.....

Motor At ..... Leave as Train No. .....

RUN ON FOLLOWING SCHEDULE:

Westbound.							Eastbound.							
45	30	15	00			New Westminster	50	05	20	35				
53	38	23	08			Meads	42	57	12	27				
54	39	24	09			Thorne Road	41	56	11	26				
55	40	25	10			Connaught Hill	40	55	10	25				
56	41	26	11			Leeside	39	54	09	24				
57	42	27	12			McGregor	38	53	08	23				
58	43	28	13			Fraser Arm	37	52	07	22				
59	44	29	14			Highland Park	36	51	06	21				
00	45	30	15			Royal Oak	35	50	05	20				
01	46	31	16			Jubilee	34	49	04	19				
02	47	32	17			West Burnaby	33	48	03	18				
03	48	33	18			McKay	32	47	02	17				
04	49	34	19			Patterson	31	46	01	16				
10	05	55	50	40	35	25	20	Central Park	30	40	45	55	00	10	15	25
11	06	56	51	41	36	26	21	Park Avenue	29	39	44	54	59	09	14	24
12	07	57	52	42	37	27	22	Collingwood E.	28	38	43	53	58	08	13	23
13	08	58	53	43	38	28	23	Collingwood W.	27	37	42	52	57	07	12	22
14	09	59	54	44	39	29	24	Earl's Road	26	36	41	51	56	06	11	21
15	10	00	55	45	40	30	25	Beaconsfield	25	35	40	50	55	05	10	20
16	11	01	56	46	41	31	26	Nanaimo Road	24	34	39	49	54	04	09	19
17	12	02	57	47	42	32	27	Gladstone	23	33	38	48	53	03	08	18
								Lakeview								
18	13	03	58	48	43	33	28	Cedar Cottage	22	32	37	47	52	02	07	17
40	35	25	20	10	05	55	50	Vancouver	00	10	15	25	30	40	45	55

Opr. .....

Through Trains will turn in Clearance on arrival at each Terminal. Locals will report arrival at Central Park to Dispatcher, who will clear them. On arrival at Vancouver they will turn in Clearance covering each round trip.

If for any reason you get 15 minutes late, report to Dispatcher.

Next train ahead is..... .....

Left this station at..... .....

ALWAYS PROTECT YOUR TRAIN.

RUN NO RISK.

operation might be eliminated as serving no good purpose, although for single track operation this is, of course, very necessary. On suburban service, where the train movements are more frequent, the terminal clearance can be eliminated and a method adopted to suit a local condition. I submit a sample copy of a clearance used on one of our suburban lines which also serves as a time table, although crews carry time tables also. This does not preclude crews from consulting train registers or registering the variation of watches as instructed by the rules.

Careful perusal and consideration of the train rules and time tables will show that the Standard Code has not been very materially departed from. They have worked out very successfully, indeed, since their adoption, and I am of the opinion that where employes can be educated to standardization, particularly in such an important matter as train rules, they feel that they are more capable to meet the exacting demands prevailing in railways generally, and it instils confidence in themselves.

One great advantage in train service is that a man who has worked under the Standard Code of train rules for some years has had that many years' experience which it not thrown away when he enters the service of another company—then he becomes a valuable asset of the company employing him.

The American Electric Railway Association's Convention, held at Atlantic City, N. J., Oct. 12 to 16, was well attended, and the manufacturers' exhibits were up to the usual standard of the last few years. The Canadian Electric Railway Association was officially represented by its President, C. B. King, Manager London Street Ry., and its Assistant Secretary, A. A. Burrows, Secretary and Business Manager, Canadian Railway and Marine World, the latter having a desk in the A.E.R.A.'s space at the entrance to the exhibits pier, where he received the registrations of Canadians attending, of whom there was a considerable number.

Passenger and Express Cars for Montreal and Southern Counties Railway.

The Montreal and Southern Counties Ry. has added to its equipment this year 6 motor passenger cars, 2 trailer passenger cars and 2 motor express cars. The motor and trailer passenger cars are alike in all details, but the power equipment, and have the following general dimensions:—

Length over vestibule	53 ft.	2	ins.
Length over buffers	54 ft.	2	ins.
Length over end posts	43 ft.	4	ins.
Body bolster centres	29 ft.	2	ins.
Width over all	8 ft.	6¼	ins.
Height, rail to coupler centre	2 ft.	10½	ins.
Height, rail to car floor line	4 ft.	2½	ins.
Height, rail to top of roof	12 ft.	8½	ins.
Weight, car body with equipment	25,700		lbs.
Weight, trucks complete	15,200		lbs.
Weight, couplers	1,800		lbs.
Weight, motors	11,400		lbs.
Weight, air brake equipment	1,300		lbs.
Weight, total	56,520		lbs.
Weight, per foot of body	476		lbs.
Weight, per foot of body with equipment	1,142.8		lbs.
Weight, per passenger seating capacity	942		lbs.

general design, have the following general dimensions:—

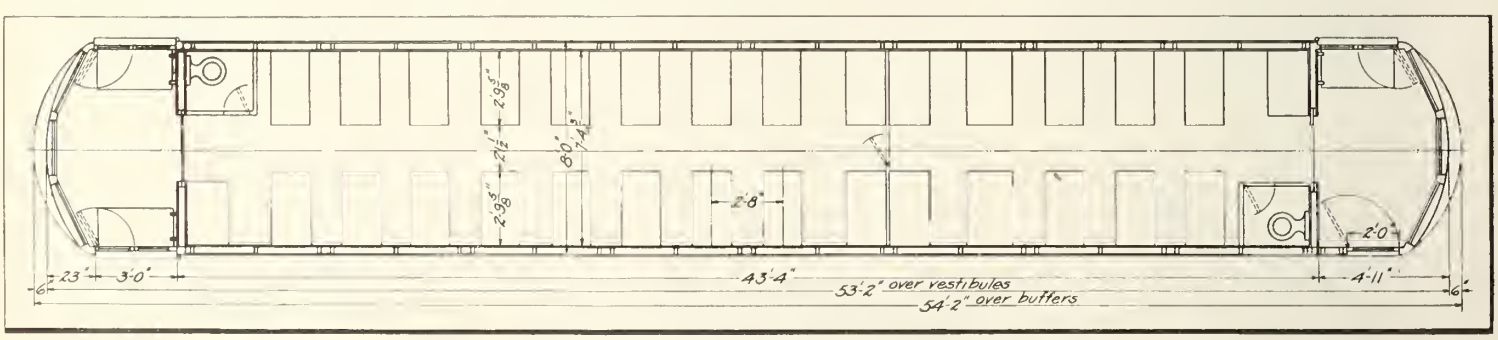
Length over vestibule	48 ft.	4	ins.
Length over buffers	49 ft.	4	ins.
Height, rail to top of roof	12 ft.	8½	ins.
Body bolster centres	25 ft.	4	ins.

These cars are equipped with trucks, air brake and electrical equipment, the same as the motor passenger cars.

All the motor cars are equipped with Westinghouse H.L. control apparatus, Westinghouse automatic air equipment, automatic car couplers, reversible seats, G.T.R. standard window fixtures, parcel racks of standard electric car design, and Ohio Brass Co. air and sand boxes, and with trolley retrievers, electric car heaters and snow scrapers.

These cars were built by the National Steel Car Co., Hamilton, Ont., which also installed all the electrical and air brake equipment, delivering the cars in a complete operative condition.

High Speed Interurban Car, Montreal and Southern Counties Railway.



Floor Plan, Interurban Car, Montreal and Southern Counties Railway.

The trucks are of the National Steel Car Co. design, and are each equipped with two 50 h.p. Westinghouse motors. The car underframing is of solid steel design, having side plates of reinforced construction, and steel centre sill. The interior finish is in solid mahogany, in plain design. The interior is divided into a main compartment and a smoking compartment, in each of which there is a toilet room, equipped with dry hopper, water cooler, etc.

The baggage cars, which are of the same

Electric Railway Notes.

It was reported to the Edmonton, Alberta, City Council, Oct. 3, that of the city's debenture debt, which is $329.28 per head of the population, $40.74 per head was incurred on account of the municipal electric railway.

The Brantford Municipal Railway Commission has ordered 6 single truck, p.a.y.e. cars from the Preston Car and Coach Co., Ltd., for the Brantford St. Ry., to be delivered in December. The commission is also having a freight car built.

The Board of Railway Commissioners has approved of the British Columbia Electric Ry.'s Standard Freight Mileage Tariff, C.R.C. no. 23, effective Sept. 1, 1914, between stations on the Vancouver and Lulu Island Ry. and the Vancouver, Fraser Valley and Southern Ry.

The Toronto Railway has undertaken to add to the protection of its grade crossings of steam railways, by placing metal troughs on the trolley wires, as recommended in the report made by C. R. Barnes et al to the Ontario Railway and Municipal Board in May.

Montreal Motorbus Service.—The Montreal City Council is taking steps to ascertain its position under the contract with the Canadian Autobus Co. The contract granted a 10 years franchise, the service to be started in June, 1913, with a provision that if on six months notice after that date the service was not put in operation the franchise would lapse. A citizen has an action for an annullment of the franchise, and the City Attorney has declined to give an opinion of the case.

The Goderich town council decided, Oct. 22, to ask the Hydro Electric Power Commission of Ontario to have its engineers report on the question of completing the partially built Ontario West Shore Ry., and having it operated under the Commission's scheme.

The Ontario Railway and Municipal Board has refused the Toronto Ry.'s application for permission to lay a siding on the west side of Church St., north of King St., opposite its offices, on which to place

a car for the collection of fare boxes from passing cars.

The Toronto Board of Control decided, Oct. 22, to ask permission from the Ontario Government to lay tracks on Bloor St., from Dundas St. west, and also to obtain an order for the Toronto Ry. to operate over them. If the latter portion of the plan is not successful, the line will be operated as a portion of the civic car lines.

The Imperial Privy Council has dismissed the Windsor, Essex and Lake Shore Rapid Ry. Co.'s appeal against the judgment of Canadian courts, in a suit brought by Nelles and Newman for $30,000 in the company's stock, in connection with the financing of the company. This case has been before the various courts for about seven years.

The Montreal Tramways Co., during the two years since J. E. Hutcheson became General Manager, has added to its equipment 350 large double truck p.a.y.e. cars, at a cost of about $3,000,000. The company now has about 1,000 cars and 240 miles of single track, and employs about 4,500 men, apart from laborers on construction work.

W. D. Baillarge, City Engineer, Quebec, is preparing a report for the city council on flat wheels on the Quebec Ry., Light and Power Co. electric lines. He has discussed the matter with C. J. Pigot, the company's Maintenance of Way Engineer, and reports state that steps will be taken to offset the unusual difficulties which are met with in operating an electric railway in the city.

The Toronto Ry. is equipping one of its widest cars with a centre aisle 21 ins. wide, and cross seats on each side, for the inspection of the Ontario Railway and Municipal Board, which has before it an application from the Toronto Street Railway Men's Union for the issuing of an order to abolish the steps along the whole of one side of the open cars, so as to permit conductors to collect fares inside the cars instead of from the outside steps as at present.

The British Columbia Electric Ry. has arranged to look after the families of all of its employes who have volunteered for active service during the war. A special officer has been appointed to take charge of the work, and the employes are contributing 1% of their monthly wages to the fund. The company has made a contribution of $1,000 to the general relief fund in Vancouver.

The Manitoba Public Utilities Commissioner was reported, Oct. 10, to have informed the Winnipeg City Council that it was intended to make an order at an early date requiring the Winnipeg Electric Ry. to operate cars over Arlington St. bridge. The Commissioner states that so long as the company is not compelled to operate its cars over the bridge it should not be called upon to pay any rental for its use.

The Appellate Court at Toronto, Oct. 22, dismissed the appeal of the Toronto Suburban Ry., from an order of the Ontario Railway and Municipal Board, directing that it build a line on Annette and Keele Sts., West Toronto. The Board ordered that the company lay the single track so as to allow of double tracking at a later period. The court's decision is that the company must commence construction at once.

The Winnipeg City Council has voted $3,500 for an investigation into the electrolysis of water pipes, etc., in the city. The investigation is being made by A. F. Ganz, under an order of the Manitoba Public Utilities Commission. A similar investigation was made in 1909 by L. A. Herdt, of Montreal, and nearly all his recommendations were adopted by the Winnipeg Electric Ry. The City Electrician reported, Oct. 5, that considerable benefit had resulted, but that there is still a heavy loss to the city through the electrolysis of pipes.

The routing of the cars on the Winnipeg Electric Ry., which has been rearranged by the City Council's traffic officer recently, is not generally approved of, and the whole matter has been taken up by the Manitoba Public Utilities Commissioner. The public hearing took place Sept. 30, and the Commissioner stated that he would endeavor to arrange for the re-routing of the cars on the basis of the report presented early in the year by R. M. Feustel.

The British Columbia Electric Ry. has rearranged a number of its routes in Vancouver. Under the new arrangements the services on several lines have been reduced, the service on stub lines affected, and the "owl" cars have been cut out. These alterations have been necessitated to prevent a deficit in operations. The men have waived the terms of their agreement for six months, and will work nine hours a day for six days to meet the altered conditions. The old debentures will be replaced as soon as business warrants.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY-TREASURER — Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY — Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

Report of Saskatoon Municipal Railway Expenses.

A supplementary report was presented by the commissioners to the Saskatoon, Sask., City Council, Oct. 5. Following are extracts:—"In accordance with the instructions of the council, we have enquired into the duties of the employes engaged in the car barns, and upon the street railway tracks, and find that in addition to the six employes whose services have already been dispensed with, an additional saving of $247 a month can be made by a readjustment of the work carried out by the car barn foreman and mechanic, track foreman and lineman, and by discharging one helper. We have dispensed with the services of the lineman, who was paid $125 a month, and reduced the wages of the track foreman from $140 to $125 less 10%. The work of the lineman will in future be carried out by the car barn and track foremen. We do not see that any further reductions can be made at present without impairing the efficiency of the service. The operating expenses for September, compared with September, 1913, are as follows:—

	1913 Cost.	Per Car Mile.
Salaries of employes.....	$7,105.01	23.562
Stores issued	611.00	1.166
Power	2,962.03	3.693
Electric light	47.83	.090
Water	20.00	.038
	$10,745.85	28.549
	1914 Cost.	Per Car Mile.
Salaries of employes	$6,863.00	11.976
Stores issued	760.54	1.327
Power	2,007.09	3.503
Electric light	49.94	.087
Water	20.00	.035
	$9,700.57	16.928

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry.—In September 2,951,980 passengers were carried on the Vancouver city and connecting suburban lines, against 3,840,475 in 1913, and 4,113,552 in 1912. The percentage paid the City of Vancouver for September was $7,003.31, against $7,935.21 for Sept., 1913, and $8,439.03 for Sept., 1912.

Gross earning for August $674,812; operating expenses, maintenance, etc., $512,174; net earnings $162,638, against $770,628 gross earnings; $566,541 operating expenses, maintenance, etc.; $204,087 net earnings for Aug. 1913. Aggregate gross earnings for two months ended Aug. 31, $1,364,835; net earnings $325,657, against $1,526,571 aggregate gross earnings; $410,083 net earnings for same period 1913.

Cape Breton Electric Co.—Gross earnings for August, $32,742.16; operating expenses and taxes $17,484.69; net earnings $15,257.47; interest charges $5,217.42; balance $10,040.05; bond sinking and improvement funds $1,190; balance for reserves, depreciation, etc. $8,850.05, against $33,454.18 gross earnings; $17,299.94 operating expenses, taxes, etc.; $16,154.24 net earnings; $4,891.67 interest charges; $11,262.57 balance; $1,190 bond sinking and improvement funds; $10,072.57 balance for reserves, depreciation, etc. for Aug., 1913. Aggregate gross earnings for eight months ended Aug. 31, $232,941.91; net earnings $95,632.01; interest, bond sinking and improvement funds $52,029.93; net balance $44,595.09, against $239,212.80 aggregate gross earnings; $99,-$42.57 net earnings; $48,734.49 interest, bond sinking and improvement funds; $51,113.08 net balance for the same period, 1913.

Lethbridge Municipal Ry.—Gross earnings for Sept., $2,731.34, of which $2,618.84 were car fares. Passengers carried, 61,798.

Regina Municipal Ry.—Revenue for three weeks ended Oct. 17, $9,645.30; passengers carried, 234,549.

Sherbrooke Railway and Power Co.—Gross earnings for 3 months, July to Sept. $39,195, against $37,309 for corresponding period 1913. Net earnings $16,753, against $14,506.

Sherbrooke Ry. and Power Co.—At the annual meeting in Montreal, Sept. 28, the report for the year ended June 30, as published in Canadian Railway and Marine World for October, was adopted.. The directors and officers for the current year are:—C. J. McCuaig, President; S. H. Ewing, Vice President; W. Farrell, Sherbrooke; W. J. Thorold, London, Eng.; S. L. Spafford, Lennoxville, Que.; F. Thompson, D. R. McCuaig, Grant Johnston, all of them being of Montreal except where otherwise mentioned. Mr. Spafford was added to the board, the others being re-elected.

Toronto Ry.—Gross receipts for September were $525,264.55 against $538,822.42 for Sept. 1913. The percentage paid to the city for September was $42,021.10 against $43,-988.75 for Sept. 1913. For the nine months ended Sept. 30, there is an increase of $102,-

307 in the aggregate gross earnings, as compared with the same period of 1913.

Toronto Ry., Toronto and York Radial Ry. and allied companies.—Gross earnings for August, $850,639; operating expenses, maintenance, etc., $432,906; net earnings $417,733, against $850,222 gross earnings; $411,300 operating expenses, maintenance, etc.; $438,922 net earnings for Aug. 1913. Aggregate gross earnings for eight months ended Aug. 31, $6,742,786; net earnings $3,265,427, against $6,317,674 aggregate gross earnings; $3,098,367 net earnings for same period 1913.

Winnipeg Electric Ry.—Gross earnings for August, $322,762; operating expenses, $187,595; net earnings $135,167, against $340,507 gross earnings; $184,335 operating expenses; $156,172 net earnings, for Aug. 1913. Aggregate gross earnings for eight months ended Aug. 31, $2,760,944; net earnings $1,165,291 against $2,649,702 aggregate gross earnings; $1,186,294 net earnings for same period 1913.

Hydro Electric Radial Railways for Toronto Northeastern District.

By a large majority, 11 of 13 municipalities in the district northeast of Toronto, voted, Oct. 19, in favor of the municipal electric radial railways, on which the municipalities in that district had requested the Hydro Electric Power Commission of Ontario to have a report prepared covering the feasibility of successfully operating such a project. The preliminary investigation by the Commission's engineers, was dealt with in a summary of the report, which appeared in Canadian Railway and Marine World, Nov., 1913, a map of the then projected lines accompanying the article. Since that date, other municipalities in the neighborhood petitioned the Commission for an investigation of their particular districts, which involved a certain rearrangement of some of the lines.

As submitted to the ratepayers of the several municipalities, the proposed system consisted of five sections as follows: 1. From Toronto, through Agincourt, Unionville, Stouffville Jct., Vandorf and Newmarket, following a general northerly direction; 2. From this Toronto northerly line at Unionville, easterly through Markham to Brooklin; 3. From Stouffville Jct. on the Toronto northerly line, easterly through Stouffville to Claremont; 4. From Vandorf on the Toronto northerly line, easterly to Uxbridge; 5. And from Whitby northerly through Brooklin to connect with the line from Unionville, thence to Port Perry. This gave a projected mileage of about 105 miles. The rearrangement consequent on the adverse vote by two municipalities has not yet been considered.

The municipalities voting were: Scarboro tp., Markham tp., Whitchurch tp., Markham village, Stouffville village and Newmarket town in York county, and Pickering tp., Uxbridge tp., Whitby tp., Reach tp., Port Perry village, Uxbridge town, and Whitby town, in Ontario county.

As stipulated in The Hydro Electric Railway Act, 1914, passed by the Ontario Legislature, the bylaws submitted to the electors contained the estimated cost of the work and the portion of the cost of construction and equipment of the line to be borne by the municipality. This apportionment by the engineers of the Commission is as follows:

Scarboro Township	$ 565,714
Markham Township	[illegible]
Whitchurch Township	488,152
Pickering Township	578,115
Uxbridge Township	227,901
Whitby Township	551,619
Reach Township	235,722
Markham Village	48,162
Stouffville Village	75,281
Port Perry Village	113,308
Newmarket Town	266,986
Uxbridge Town	204,665
Whitby Town	183,774
Total	$4,346,938

The above estimate was made on the basis of an assumed Dominion subsidy of $6,400 a mile of main line, but does not include the line within the Toronto city limits, estimates on which are being prepared. The estimated annual operating revenue of the line as proposed, inclusive of the Toronto section, is $776,400. Of the municipalities which voted on the project Uxbridge tp. and Newmarket town were the only ones to reject it.

The financing of the lines will be in the control of the Commission, which may raise money for the construction and equipment by the issue on behalf of the corporations, of bonds, charged upon and secured by the railway and all its assets. Neither the Province nor the Commission will be liable for the bonds, except in so far as the Lieutenant Governor in Council is given power to authorize the Provincial Treasurer to do so. The bonds will be issued to run for 50 years, on terms to be determined by the Commission. No provision for a sinking fund will be made during the first ten years, but after that period, it is provided that out of the revenue a sufficient sum may be laid aside each year to redeem the bonds on maturity.

The representatives of the various municipalities will, it is said, hold a meeting, and consult with the Commission as to what modifications will have to be made in the plans, owing to the defeat of the bylaw in Newmarket town and Uxbridge tp. (Oct., pg. 476.)

Electric Railway Projects, Construction, Betterments, Etc.

Brantford and Hamilton Electric Ry.—Application is being made to the Dominion Parliament to extend the time within which the company may commence and complete the line authorized to be built from Langford in Brantford tp. to Galt, Ont. (Jan., 1913, pg. 39.)

Brantford St. Ry.-Grand Valley Ry.—The material for the improvement of the line in East Ward, Brantford, Ont., is being delivered, and the betterments are being gone on with. The work in hand covers only the immediate necessary betterments. The plans for the general improvement of the line are under consideration, and an announcement of their nature and cost is expected to be made at an early date (Aug., pg. 476.)

We are officially advised that the Brantford Municipal Ry. Commission is laying 690 ft. of track on St. Paul's Ave., Brantford, with 80 lb. steel, and is relaying the loop in the East Ward, 6,100 ft., also with 80 lb. steel.

British Columbia Electric Ry.—The third unit of the Jordan River power plant, near Victoria, B.C., has been put in operation. (Oct., pg. 476.)

Cornwall St. Ry. Light and Power Co.—A bylaw extending the company's franchise for 20 years was carried by the ratepayers, Oct. 14, by 657 to 163. (Oct., pg. 476.)

Dunnville, Wellandport and Beamsville Electric Ry.—We are officially advised that this company has secured deeds for a considerable stretch of private right of way, that about 12 miles of grading have been done, that considerable work has been done on culverts, drains and fencing, and that the bridging for the same section is fairly well completed. Hydro Electric Power Commission of Ontario engineers have been going over the route from Dunnville to St. Catharines, in order to prepare a report, there being a proposition that the line be taken over and completed as part of the commission's proposed system of interurban lines. J. A. Ross, Wellandport, Ont., is President. (Aug., pg. 385.)

Edmonton Radial Ry.—A recent press report stated that the Edmonton, Alberta, City Council was to spend $168,000 on improvements on the E.R. Ry. An amount was voted early in the year, and details of the several works, with amounts to be expended upon each, were given in our April issue, pg. 194. The total amount then voted was $169,056.70, and we are officially advised that no additional sums have been voted since. (Oct., pg. 476.)

Edmonton Northwestern Radial Ry.—The Alberta Legislature is being asked to incorporate a company with this title to build railway or tramway lines, to be operated by any power other than steam, from Edmonton northwesterly to the Pembina River. Short, Woods, Biggar and Collisson, Edmonton, solicitors for applicants.

Hydro Electric Power Commission of Ontario Projected Railways.—Since Oct. 1 a party of engineers, in charge of J. N. Stanley, has been working in the vicinity of Guelph, Ont., making surveys for an electric railway from that city to Toronto. He is reported to have said that the Commission was considering the building of a line from Hamilton to Guelph; that the surveys now being made would connect with it, and that another line would be laid out northerly from Guelph, thus making that city a central point for a Western Ontario system.

London, Grand Bend and Stratford Ry.—A letter is reported to have been received in Stratford, Ont., from C. T. McAllister, who is in London, Eng., arranging the finances for the construction of this projected railway. The letter states than an assurance has been given that as soon as business becomes normal the agreement which was practically ready for signature when the war broke out, will be completed, and the money for construction supplied.

Montreal Tramways Co.—J. E. Hutcheson, General Manager, is reported to have said in a recent statement that the company had been employing about 1,000 men upon betterment and construction work on its various lines. New intersections have been placed at St. James and McGill Streets, 132 lb. rails replacing 100 lb. rails; and at St. Catherine St. and Atwater Ave., where a total weight of 85,000 lbs. replaces intersections weighing 45,000 lbs. The devil strip from St. James to Craig St. has been widened to 4 ft. 8½ in. Another new intersection, also 132 lbs. to the yard, is being laid at Bleury and Craig Streets. These are being made so as to permit cars coming in different directions to pass each other on the intersections without stopping, thus increasing their efficiency very considerably. The city is doing a good deal of paving work, and wherever necessary the company is cooperating by relaying its rails. (Aug., pg. 385.)

Morrisburg and Ottawa Electric Ry.—We are officially advised that a contract for the construction of this line has been let to the Morrisburg and Ottawa Construction Co., Ltd., incorporation of which was mentioned in Canadian Railway and Marine World for October. G. D. Mumford, 66 Broadway, New York, N.Y., is President. No information is available as to when construction will be gone on with.

The address of J. G. Kilt, President, at the recent annual meeting of shareholders, was made public Oct. 13. The directors express regret that greater progress has not been made, and state that shareholders who have not paid up their shares are largely responsible. If the directors had been able to show that $75,000 or $100,000 had been expended on the line it would have been an easy matter to get the bonds on the market. Legal proceedings were being taken against shareholders who had not paid the calls on the shares subscribed for. Shareholders representing about $60,000 of calls were on the list of delinquents. The contract for construction had been let to the Morrisburg and Ottawa Construction Co., the President of which is G. D. Mumford of New York. It is hoped to arrange the company's finances so as to start construction in the spring of 1915. The directors are confident that the line would be a success, and express regret that the townships through which it would pass have declined to assist the company by giving a guarantee of bonds. (Oct., pg. 477.)

Ontario West Shore Ry.—Negotiations were opened, Oct. 2, by a contractor named Campbell, of Strathroy, Ont., with the municipal authorities interested in this incompleted railway, with a view of something being done towards its completion. The contractor, it is said, has agreed to submit a proposition to the municipalities to complete the grading and to do the tracklaying. (Sept., pg. 430.)

Ottawa and St. Lawrence Electric Ry.—Ottawa papers of Sept. 30 reported construction started at Russell, Ont., on the first section of this projected electric railway. This section, it is stated, will be 119 miles long, and will extend from Ottawa to Morrisburg, and thence to Beaudet, with a branch from Metcalfe to Russell. There was a public celebration at the turning of the first sod, and the day was observed as a general holiday in Russell. The work undertaken is, it is said, being done by the company, dealing directly with local men. It does not appear from the reports that any extensive work is being done. (Jan., pg. 38.)

St. John Ry.—We were officially advised, Oct. 5, that work was in progress on the extension of the line to the Maynor House, 3.5 miles, of which 1.5 miles is within the Glen Falls subdivision. Later press reports state that additional men have been set to work, in the expectation of getting the line finished by the winter. (Sept., pg. 431.)

The western section of the new bridge across the St. John River at the reversible falls is completed and the eastern section is well advanced and is expected to be completed this year. It is to be used by the St. John Ry. as well as for vehicular traffic.

Toronto Ry.—Work has been in progress for some time relaying the track on Queen St. West near the subway, and is now about completed. Arrangements have been made for the reconstruction of the track allowance on College St., between Spadina Ave. and Bathurst St. New rails will be laid. (Oct., pg. 477.)

Toronto Suburban Ry.—The Ontario Railway and Municipal Board having after an inspection approved of the extension from Weston to Woodbridge, Ont., it was opened for traffic, Oct. 10. The extension is 13 miles long, and has been under construction for over two years. It was practically completed a year ago, but owing to certain difficulties the new section was not connected up. The questions arising in connection with the Main St. subway at Weston have not yet been adjusted, and in order to enable the line to be opened a temporary line has been laid at that point. A one hour service each way is being given between West Toronto and Woodbridge.

On the Guelph extension tracklaying has been completed from Islington to beyond Eden Mills. Considerable ballasting has been done, trolley poles have been put up, and other work done. While some work is reported to be still in progress west of Eden Mills, operations on other sections of the line were suspended Oct. 8. (Sept., pg. 432.)

Three Rivers Traction Co.—The question of granting a franchise to the company for the building of an electric railway in Three Rivers, Que., is, we are officially advised, still under consideration by the City Council. (Sept., pg. 431.)

Personal Paragraph.

T. J. KENNEDY, who has been appointed President and General Manager, Algoma Central and Hudson Bay Ry. and Algoma Eastern Ry., Sault Ste. Marie, has also been appointed Vice President and General Manager, International Transit Co., and Trans St. Marys Traction Co., in charge of street railways and ferries.

R. W. Dean, St. John, N.B., is reported to be operating an autobus service from Douglas Ave., St. John, to Lorneville, N.B.

The Toronto Street Railwaymen's Union has 85 of its members in the Canadian overseas military force which has gone to the front.

Motor cars for section work are considered an important development towards increase in efficiency, and their use is recommended by the committee on method of rail renewal of the Roadmasters' and Maintenance of Way Association.

Wood preservation by creosoting will, it is claimed, be affected in the U.S. by the war, as more than a third of the creosote oil employed for that purpose in the U.S. is imported from Great Britain and Germany.

The Postmaster Generalship.—T. Chase Casgrain, K.C., Chairman of the Canadian Section of the International Waterways Commission, has been appointed Postmaster General, vice Hon. L. P. Pelletier, resigned on account of illness. Mr. Pelletier has also given up his seat in the House of Commons.

Cleaning snow from switches is said to be more effectively handled by the hydrocarbon method than by any other. This method consists in melting the snow by pouring on it ignited hydro-carbon oil, a volatile liquid comparable to gasoline. It is applied to switches by hand distributing cans, which hold about 3 gallons.

Considerable economy may be effected in the wear of switch points in yards at points where the service is extreme, by moving the point of lesser wear back 26 ins., so that the first lug of one point and the second lug of the other point are opposite, and introducing a guard rail 9 or 10 ft. long, curved sharply through 12 ins. at the end which covers the switch, and in the standard manner at the other end.

Assessment of Railway Bridge at Cornwall.—The Ontario Railway and Municipal Board has given judgment in favor of Cornwall township in a case between the New York division, and the township. Mr. Justice Britton gave judgment last June, holding the International Bridge crossing the River St. Lawrence, west of Cornwall, assessable. The railway company appealed to the Ontario Railway and Municipal Board, which has now given judgment in favor of the township, upholding the assessment of $300,000 placed on the bridge by the township.

Telegraph, Telephone and Cable Matters.

Joseph Townsley, who died at Montreal, Oct. 5, was associated with the C.P.R. Telegraphs from the company's inception until his retirement in 1911, and superintended the building of the system between Halifax, Canso and Port Arthur. He retired from active service Jan. 1, 1911, when Superintendent of Telepraphs at Montreal, having reached the age of 70.

The Western Union Telegraph Co. has announced a reduction in cable rates to points in British West Indies, from Oct. 31. The rate is 36c. a word to all points except St. Thomas and St. Croix, the latter rate being 50c. a word. Deferred rate messages in plain language are at half these rates. The former rates ranged from 48c. a word to Jamaica, to $1.12 to British Guiana.

The damage which was done to the Pacific Cable Board's cable, near Fanning Island, recently, presumably by a German warship, has been repaired, and communication between Fanning Island and Australia has been restored. The damage to the Canadian section will be repaired as speedily as possible. During repairs, communication was maintained round the world in the other direction.

The Great North Western Telegraph Co.'s annual meeting was held at Toronto, Sept. 30. Following are the directors and officers for the current year: President, Z. A. Lash; Vice President, Adam Brown; other directors, Jas. Hedley, Hon. J. K. Kerr, N. Carlton, Aemilius Jarvis, F. B. Hayes and E. Y. Gallaher. G. D. Perry is General Manager, A. C. McConnell, Secretary and Auditor, and D. E. Henry, Treasurer.

Among the Express Companies.

The Canadian Northern Ex. Co. has opened offices at Speers, Sask., and Lochearn, Alta., and has closed its office at Rocky Mountain House, Alta.

The City of Quebec has applied to the Board of Railway Commissioners for an order extending the boundaries within which express companies are required to collect and deliver parcels.

The Board of Railway Commissioners has extended the express delivery and collection limits in Swift Current, Sask., and has rescinded the order of July 3, defining the previous limits.

The Board of Railway Commissioners has issued order 22634, Sept. 28, re application of Edmonton City Dairy, Ltd., requiring the Dominion Ex. Co., under rule 3 of its special cream tariffs C.R.C. 4139 and 4202, to refund 5c. a can on its consignments to Edmonton between Oct. 15, 1912, and Sept. 17, 1913, inclusive, the company being outside the delivery limits, no delivery service having therefore been furnished. The order reads: "It is declared that rule 1 of the Dominion Ex. Co.'s special local tariff of rates on cream C.R.C. 4139, Oct. 15, 1912, and C.R.C. 4202, Nov. 28, 1912, was subject to the obligation imposed by rule 3 with respect to any area within municipal boundaries which had, prior to Sept. 18, 1913, been excluded by orders of the Board from the obligation imposed upon the express company by order 13357, Mar. 30, 1911, and it is ordered that the Dominion Ex. Co. be authorized to refund to the applicant 5c. a can on consignments of cream carried to Edmonton between Oct. 15, 1912, and Sept. 17, 1913, which the express company did not deliver in the said excluded area within the municipal boundaries of Edmonton."

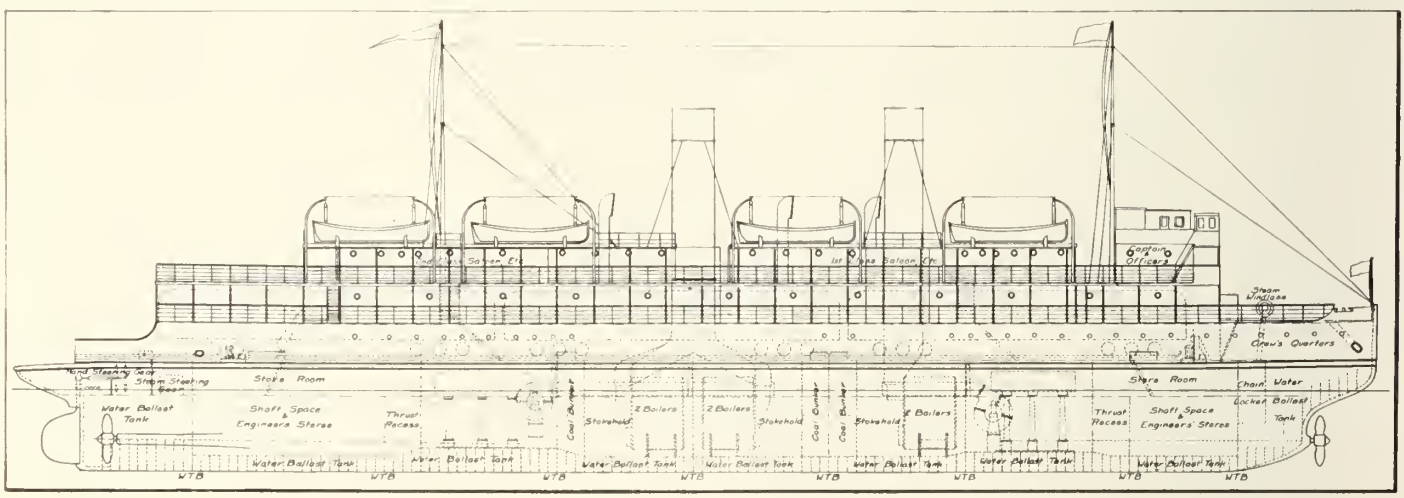
Marine Department

Car Ferry Steamship for Prince Edward Island Service.

As stated in Canadian Railway and Marine World for October, Sir W. G. Armstrong Whitworth & Co., Ltd., wrote us Aug. 31 that they had had to inform the Dominion Government that the launching of the Prince Edward Island car ferry had been indefinitely postponed, as the machinery had had to be put on one side to enable them to execute urgent Admiralty contracts for turbine machinery, which had to be completed with all speed, to the exclusion of everything else. Conditions, however, soon changed, as a London cablegram of Oct. 5 stated that the vessel was launched at Newcastle-upon-Tyne that day, Mrs. G. H. Perley, of Ottawa, wife of the acting High Commissioner for Canada in England, having performed the christening, the name chosen being Prince Edward Island. The builders presented Mrs. Perley with a silver model of the vessel. Earl Grey, ex-Governor-General of Canada, and Hon. G. H. Perley spoke.

The new vessel is an extremely interesting one and differs to some extent from anything of her class that has yet been produced. She is designed in accordance with the experience gained by the firm in building a number of icebreaking steamers now in use in the Baltic Sea and on Lake Baikal, on the Trans-Siberian Ry., and approaches to some extent the Russian icebreaker Ermack, although she is not such a powerful vessel. The governing principle in designing such vessels is to provide as far as possible against the nip of two approaching ice floes, a principle which was exemplified in the construction of the Fram, in which the Norwegian explorer, Nansen, drifted across the higher latitudes of the Arctic Ocean, and this principle has been adopted as far as possible within the limits of the present design. The ice conditions which this car ferry will be called upon to cope with are severe, although not of the same order of magnitude as those which have been successfully overcome in the Baltic Sea.

She is designed and built for the special service of transporting trains across the Northumberland Strait from Cape Tormentine, N.B., to Carleton Point, P.E.I., at all seasons. This passage is frozen over for some months in the year, and provision has had to be made for breaking ice which will probably attain a thickness of some 3 or 4 ft. This severe duty has formed the governing factor in the design, both as regards the form and scantling of the hull and the power and arrangement of the propelling machinery. The icebreaking ferry steamers of the Canadian Lakes and the railway ferry steamer Baikal maintain a constant connection between their stations through ice up to 4 ft. thick, as well as occasionally meeting and breaking through drift ice which may be piled up by the wind to nearly 20 ft., so that the problem to be solved, although it differs in many respects from any that has yet been attempted, does not in general principle present any insuperable difficulty. A well designed icebreaker should be capable of forcing a passage through ice of almost any thickness which is likely to be met with in these latitudes, provided of course that the ice has not grounded, but the exigencies of railway service, such as the deck area that is required for transporting, embarking and disembarking passenger or freight cars makes the combination of the best icebreaking form, and suitable ferry accommodation very difficult to attain in a vessel of comparatively small dimensions.



Car Ferry Prince Edward Island.

The principal dimensions of the s.s. Prince Edward Island are: Length over fender 300 ft.; length between perpendiculars 285 ft.; breadth extreme over fenders 53 ft. 10 ins.; breadth moulded at deck 52 ft.; depth moulded 24 ft. The mean draught of water when laden with gross weight of cars and freight of 500 tons, together with 150 tons of coal and stores, is 18 ft. The general arrangement of the vessel is shown by the accompanying plans. It has an upper or railway deck with a superstructure in which is provided accommodation for passengers and officers. The cars will be run over a hinged gangway at the after end of the vessel on to the railway deck, and will be secured in position by suitable appliances so as to avoid any chance of breaking loose in a rough sea.

A feature of the vessel is the arrangement of the propelling machinery. There are three sets of triple expansion engines working at 180 lbs. pressure, with Howden's forced draught. Two sets of engines drive twin screws fitted as usual at the stern, and a third screw at the bow. Icebreaking steamers to be effective must have considerable manoeuvring powers, as they have often a very small space in which to work, and for this reason the twin screw arrangement is advisable. The bow screw is not introduced for speed purposes, as it is generally known that a propeller in this position has very little propulsive efficiency, but when used for disintegrating packed ice it is very effective, and in disturbing the water under the ice, thus depriving it of its support, and so reducing its resistance to crushing so that the overhanging bow of the vessel can cut its way through without experiencing either the shock or resistance to which the older type of icebreaker was constantly exposed, and very often failed to overcome. The bow screw will also be very useful when the vessel is going astern or being manoeuvred alongside the landing pier, and for driving the vessel astern when working in heavy ice.

The after propelling machinery is of 5,000 i.h.p., the forward set 2,000 i.h.p., and is capable of propelling the vessel at 14 knots an hour in open water. The propelling machinery is of the inverted direct acting triple expansion type, the after engines having cylinders 23, 37 and 60 ins. diar. with a stroke of 39 ins., and the forward engines cylinders 21, 33½ and 54 ins. diar. with a stroke of 36 ins. Steam is supplied by six boilers 16 ft. diameter by 11¾ ft. long, of the usual single ended type, fitted with Howden's forced draught, and with a heating surface of about 16,500 sq. ft. There are four funnels placed at the sides of the vessels so as to give a clear train deck. Fore and aft tubular stays and cross lattice stays are fitted for binding the funnels together.

The hull is exceedingly strong and heavy. The stem and stern consist of heavy steel castings, which concentrate on a small space the momentum of the vessel and so give the maximum striking power. The frames are very closely spaced and the hull has been specially designed to give great strength to the railway deck, on which the trains will be run. A belt of flush plating some 12 ft. deep and 1 in. thick extends from stem to stern at the waterline and generally speaking every constructional detail has been worked out so as to offer the greatest resistance to ice

pressure. The principle of subdivision has been carried very far, so that the vessel may be pierced in several compartments before she will be in danger of sinking, and in addition a double bottom of the usual system is fitted. The hull is divided into nine compartments by eight watertight bulkheads, and filled with water ballast tanks in the cellular double bottom.

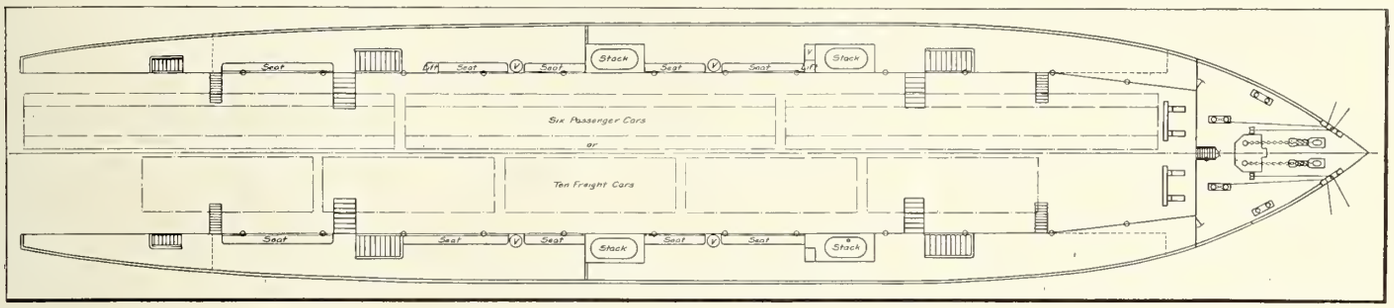
The condensers, which are separate from the main framing, are of the uniflux type, and a pair of feed pumps are fitted in each engine room. The pumping arrangements are complete and have been specially designed to suit the various compartments into which the vessel is divided. A large horizontal duplex ballast pump is fitted, which can discharge through the forward condenser, and there are two bilge pumps in each engine room. The circulating water from the forward condenser can be discharged through two outlets at the bow, to free the ship from frazil or lolly ice. There is a surface feed heater and feed filter in each engine room. The whole of the shafting and reciprocating parts have a factor of safety much above the Lloyd's and Board of Trade requirements, and the propeller blades are massive and of great strength, so that they may be brought up by the ice without breaking, when running at full speed.

The car tracks are placed on the main deck, above which are three decks—promenade, upper promenade and boat deck. The engineers and crew will be located on the main deck, the former aft and the latter forward. Stores, etc., will be located on other part of the same deck. The promenade deck is immediately above the main deck and extends round the space occupied by the cars. Over this is the upper promenade and saloon deck. The forward house on this deck contains staterooms for the captain, chief and second officers and the first class saloon, with seats for 38 passengers, ladies' room, and smoking room, pantry and stateroom for the stewardess, while the aft deckhouse contains similar accommodation for the second class passengers. Above this is the boat deck, fitted with davits for eight lifeboats, the wheelhouse being forward. The passengers will alight from the cars and pass to the promenade deck by means of stairways on both sides of the vessel. These stairways lead to the entrance halls of the saloon deckhouses, from which large doors give access to the several apartments. In the pantries are lifts going down to the main deck, where the galley is situated.

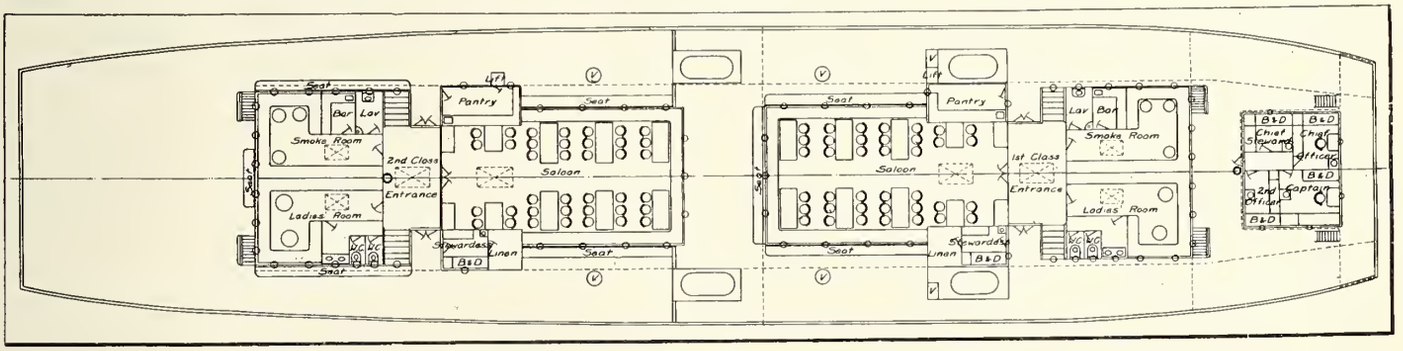
The public room, with the officers' and engineers' accommodation, are on the upper promenade deck, entrance to which is obtained by four teak stairways from the promenade deck. The first class public rooms are handsomely fitted and the dining room is a large apartment at the forward end of the promenade deck. The floor is of oak parquet artistically arranged, and the framing and panelling throughout is of solid oak handsomely carved. The ceiling is of plaster with painted panel mouldings. A number of small dining tables are arranged to seat altogether 46 people. The ladies' and smoking rooms are fitted up in somewhat the same style. The general effect of these rooms has been worked out with the view of departing as far as possible from the stereotyped forms of internal decoration peculiar to steamships, and to provide rooms and passages which resemble those of a well appointed house. The second class public rooms, entrances and corridors are handsomely panelled in oak and mahogany, and have swing doors with plate glass panels arranged in small squares. The stairways from the entrance to the promenade deck are of carved mahogany with rubber treads. The captain's night and day cabins are at the forward end of the upper promenade deck. The accommodation for the officers and engineers is abaft the second class accommodation. The petty officers', cooks' and stewards' accommodation, together with the first and second class men's lavatories, galley, lamp and paint room, messrooms for seamen and firemen, are arranged at the sides of the railway deck inside the superstructure. The crew will be berthed at the forward end of the railway deck. The life saving appliances of this vessel are to comply with the latest requirements of the Maritime Convention.

A large warping winch is fitted at the forward end of the railway deck, and two capstans at the after end, for hauling cars on board. A powerful windlass is fitted at the forward end of the promenade deck, and a combined hand and steam steering gear is fitted at the stern on the second deck. The electric light installation is of a very complete nature and includes two 25,000 c.p. searchlights.

The contract was awarded in February, on a tender of £138,000.



Railway Deck, Car Ferry Prince Edward Island.



Promenade Deck, Car Ferry Prince Edward Island.

The Stranding of the s.s. Shenandoah.

Capt. L. A. Demers, Dominion Wreck Commissioner, has given the following judgment concurred in by Captains G. N. Kennealy and M. Cardiff, as nautical assessors, on the stranding of the s.s. Shenandoah, a single screw vessel of 3,886 tons gross, off Little Musquash, N.B., on Sept. 3:—

The court having carefully weighed the evidence is unanimous in its conclusion that the master, Capt. W. M. Lee, placed too implicit reliance on the courses steered during preceding voyages, and that in view of the prevailing weather conditions, coupled with the ever existing uncertainty of tide velocity in the Bay of Fundy, he should have exercised greater caution in assuring himself of his precise position by more frequent soundings, and furthermore, that the estimated distance of four miles from the Lurcher is unreliable, being based absolutely on a possible variable sound and consequently not in accordance with the dictates of authentic navigation. In view, therefore, of his failure in exercising the necessary caution to determine his position, the court finds it incumbent upon it to reprimand him and warn him to adopt more reliable and authentic methods of navigation in future. The court exonerates the other officers of the ship of culpability in the stranding. The two assessors assisting at the enquiry recommend that an efficient lightship, with a strong fog horn, be placed six miles south of Partridge Island, and that the fog signal now situated at Tiner's Point be removed to Split Rock, and be equipped with a more efficient fog horn; also that a more efficient fog signal be established on Cape Spencer.

Salvage Operations on the Empress of Ireland.

Inasmuch as it was definitely settled that it was practically impossible to raise the Empress of Ireland so unfortunately sunk in the lower St. Lawrence, the next thing was to save whatever was possible from the wreck—all the bodies of the drowned that could be reached, the mails and the gold, of which there was a large amount.

When working in the interior of a sunken vessel the divers very properly object to following intricate passages where air pipes may be fouled and life lines cannot have a direct pull, and especially where, as in this case, the working pressure approaches the limit of endurance. One diver lost his life on this work. It was determined, therefore, to cut a number of holes in the inclined side of the ship to give the men short and direct entrances to certain locations where they might expect to make the most important finds.

The general scheme was to cut a number of rectangular openings, say 4 ft. or more in dimensions, through the steel plates, giving the divers free passage through them, and four or more of these holes have been cut. For each side of the rectangle a row of holes is drilled as close together as possible, defining the opening all around, and then the piece inclosed is torn out. This job is not as easy as the telling of it, the most difficult part of all, perhaps, being the drilling of the first one or two holes, on account of the difficulty of applying the necessary pressure behind the drill to make it cut. After two corner holes have been drilled, hook bolts can be inserted and these are made to support a steel beam placed at such a distance from the sheet as to form a proper backer for the drill. The work is then comparatively easy for all that row. The thin portions between the holes are not cut away by chisels or otherwise, but the sheet is torn away bodily by brute force. The surface being inclined at a considerable angle, hooks can be inserted in a number of holes at once along the bottom, and then a powerful pull from a hoisting engine on the wrecker will do the rest. In this case it is not necessary to pull the sheet entirely off; it can be swung up and let remain there like an open door.

At the depth where the drills were employed the water pressure was about 40 lb., so that this had to be provided for by additional air pressure to correspond. The air is supplied by two Rand compressors, RC, of a type now somewhat obsolete, but which have done excellent service in other places. The air for the divers is supplied by hand operated pumps, which the divers prefer. Six divers are employed with a large gang of men for the various service required. The work of salvage is being done by King & Wotherspoon, of New York. —F. Richards, in Engineering Record.

Shipping Report From Fort William.

F. & W. Jones, grain, vessel and marine insurance brokers, Fort William, Ont., wrote Oct. 15:—Coal arrivals are still keeping up, there being 16 cargoes, two anthracite and 14 bituminous, in the first half of October. Dispatch continues good, and much on the same lines as at our last writing. Western rail shipments have been more active but are not yet up to what is usual at this season of the year. A most noticeable feature is the small amount of tonnage lined up, and docks expect little improvement for the remainder of the season. The current opinion is that stocks are ample for the expected winter western shipments.

The grain situation has been disappointing from a shipping viewpoint. While lake shipments have naturally advanced, on account of the arrival of the new crop, there has been no semblance of rush business. Ninety three cargoes have gone east since the first of the month, 78 of which were in Canadian bottoms and 15 in U.S. bottoms, showing an aggregate of 6,675,116 bush. of all grains. The total stocks in elevators have steadily increased, and at time of writing stand at 22,462,904 bush. against 18,414,290 on Oct. 1. It will thus been seen that movement is by no means over active. There is still a large quantity of grain held in western line elevators yet to come forward. Much of this is said to be still in farmers' hands, who are apparently waiting more active markets. Should a higher export market develop, undoubtedly the larger amount of this grain would be rushed forward to the head of the lakes and thus further add up stocks. There are some four vessels lined up at elevators to load winter storage grain to be held at eastern points, and several others are expected to arrive shortly. As yet there are no vessels in sight for storage at the head of the lakes, although two vessels have laid up expecting to secure cargoes. While the general feeling, in view of the foregoing, is one of uncertainty, still it is thought likely that there will be a steady demand for winter storage boats. Although shippers at the moment do not appear to be active buyers, it is known that they already hold a good quantity of grain, and they will be naturally anxious to carry this over at the least possible cost, which means winter vessel storage. Stocks at date, receipts and shipments, are as follows:—

	Stocks.	Receipts.	Shipments
Wheat	17,206.128	11,979.531	11,121.304
Oats	3,174.757	2,857.630	1,496.629
Barley	553.379	480.238	335.209
Flax	1,528.640	430.929	757.549

List of Steam Vessels Registered in Canada During August and September, 1914.

No.	Name	Port of Registry	Where and When Built	Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134367	Dick T	Sorel, Que.	Sorel, Que. 1914	64 0	15 2	6 3	44	20	16n.h.p. sc.	Sable Union Co., Quebec, Que.
131220	Electrona	Sydney, N.S.	Portland, Me . 1913	108 0	23 5	9 6	231	157	46 " "	Cape Breton Electric Co., Sydney, N. S.
134358	Felicia D. ..	Montreal	Sorel, Que. 1914	81 0	22 2	11 6	161	80	54 " "	Sincennes McNaughton Line, Montreal.
134379	Fred A. Lee ..	Sault Ste Marie Ont	Port Huron, Mich.. 1896	72 0	15 5	10 0	65	32	14 " "	L. Penhorwood, Sault Ste. Marie, Ont.
134253	Garry	Winnipeg ..	Selkirk, Man. 1914	101 6	20 5	8 5	120	81	31 " "	North West Navigation Co., Winnipeg ,Man.
134441	Hudson Bay Terminals, Lighter No. 3	Toronto	Toronto 1914	112 0	21 5	9 0	268	129	19 " "	Minister of Railways and Canals, Ottawa, Ont.
130440	Inland (1)	Sarnia, Ont.	Cleveland, Ohio .. 1894	248 0	42 0	21 5	1,889	1,098	146 " "	Reid Wrecking Co., Sarnia, Ont.
134250	J. H. G. Hagarty.	Toronto	Collingwood, Ont. 1914	536 0	58 3	27 3	7,462	5,704	217 " "	St. Lawrence & Chicago Steam Navigation Co.,Toronto.
134138	Le Progres	Quebec, Que.	Lauzon, Que. 1914	126 5	34 2	11 0	465	242	37 " "	City of Three Rivers, Que.
133677	Musquash	Halifax, N.S.	Portsmouth, Eng. . 1894	51 0	11 8	5 2	22	15	12 " "	F. Longley, Halifax, N.S.
134312	Northland Call	Kenora, Ont.	Athahasca, Alta. .. 1911	95 3	18 0	2 4	103	55	3 " pa	Northern Transportation Co., Athahasca, Alta.
134311	Northland Echo.	Kenora, Ont.	Athabasca, Alta. .. 1912	120 0	24 0	3 6	147	79	5 " "	" " "
134184	P. W. D. No. 1 (2) ..	St. John, N. B.	Sorel, Que. 1905	244 0	42 8	18 0	1,605	888	66 " sc	Minister of Public Works, Ottawa.
136307	Sable I.	Windsor, N.S.	Paisley Scotland.. 1914	183 0	28 6	12 2	734	341	85 " "	A. Farquhar, Halifax, N S.
134276	Sicamous	Victoria, B. C...	Okanagan Landing, B. C 1914	200 5	40 0	8 0	1,787	994	50 " pa	C P.R. Co., Montreal.
115849	Tarantula	Montreal	Poplar England .. 1902	152 7	15 3	7 8	124	84	59 " sc.	J. K. L. Ross, Montreal.
134016	Thomas Fisher	Port Arthur, Ont.	Fort William, Ont.. 1914	65 0	14 7	7 1	52	23	14 " "	Great Lakes Dredging Co., Port Arthur, Ont.
133949	Winnipeg (3).	Ottawa, Ont.	Newcastle on Tyne . 1912	415 0	55 2	31 1	6,330	3,863	597 " "	International Petroleum Co., Toronto.

(1) Formerly J. W. Nicholas. (2) Formerly W. S. Fielding. (3) Formerly Adorna.

List of Sailing Vessels and Barges Registered in Canada During August and September, 1914.

No.	Name	Port of Registry	Rig	Where and When Built	Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
125127	Bertie Calbick ..	Kingston, Ont. ..	Schr.	Two Rivers, Wis. 1874	134 4	27 2	9 3	227	H. Vandusen, Deseronto, Ont.
130977	C. S. B. D. and C. Co.'s No. 8	Collingwood, Ont.	Scow	Collingwood, Ont. 1914	130 0	30 0	10 7	389	C. S. Boone Dredging & Construction Co., Toronto
33553	Ellen, Mary ..	Halifax, N. S. ..	Schr..	Pasbebiac, N. S. 1878	71 3	20 4	8 3	66	R. Jones & Whitman, Halifax, N.S.
134389	McLean, No. 3. ..	Sault Ste. Marie, Ont.	Scow.	Sault Ste. Marie, Ont 1913	78 0	30 0	7 0	164	A. B. McLean, Sault Ste. Marie, Ont.
134393	Mary A. Tobin ..	Lunenburg, N. S. ..	Schr. .	Lunenburg, N. S. 1914	108 4	25 8	10 4	96	C. Iverson, M.G., Lunenburg, N.S.
134442	Q. H. C., No. 51..	Toronto ..	Scow .	Toronto 1914	108 0	28 0	8 7	241	Polson Iron Works, Toronto
134443	Q. H. C., No. 52..	Toronto	"	" 1914	108 0	28 0	8 7	241	" " "
134441	Q. H. C., No. 53..	"	"	" 1914	108 0	28 0	8 7	241	" " "
134445	Q. H. C., No. 54..	"	"	" 1914	144 0	31 0	11 1	434	" " "
134446	Q. H. C., No. 55..	"	"	" 1914	144 0	31 0	11 1	434	" " "
134447	Q. H. C., No. 56..	"	"	" 1914	144 0	31 0	11 1	434	" " "
131185	R., No. 1	Peterborough, Ont.	"	Peterborough, Ont. 1914	144 0	31 0	11 1	434	" " "
131186	R., No. 2	"	"	" 1914	80 0	28 0	5 4	104	C. H. Rogers, Peterborough, Ont.
134359	S. M. N. L. Derrick scow	Montreal	"	Sorel, Que. 1914	80 0	28 0	5 4	104	" " "
134449	T. & C.	Toronto	Barge	Buffalo, N. Y. .. 1902	96 5	27 6	4 0	84	Sincennes McNaughton Line, Montreal
130223	White and Friant.	Owen Sound, Ont..	Schr.	Bay City, Mich... 1881	113 0	32 0	11 0	215	Lake Simcoe Ice Supply Co., Toronto
					158 0	28 0	11 6	278	Peninsula Tug and Towing Co., Wiarton, Ont.

Lights and Fog Alarms on the Great Lakes and St. Lawrence River.

The Department of Marine has issued a notice that all Canadian lights and fog alarms on Lake Superior will be kept in operation until the close of navigation, with the exception of those at Caribou Island, Otter Island, Michipicoten Island, Michipicoten Island east end, Gargantua, Michipicoten harbor, Corbeil Point and Ile Parisienne, from which stations the keepers may be removed at any time after Dec. 1. Mariners must not rely on finding any of these lights in operation later than Dec. 1. All Canadian lights and fog alarms on Lake Huron, Georgian Bay, Lake St. Clair, Lake Erie, Lake Ontario, and connecting waters will be kept in operation until the close of navigation, except the southeast shoal lightship Lake Erie, which may be forced to abandon her station by ice conditions before the close of navigation. All Canadian lights on the St. Lawrence River will be kept in operation until the close of navigation. All gas buoys and floating aids to navigation will be kept at their stations as long as ice conditions will permit, and in cases where it is necessary to remove gas buoys before the close of navigation, spar markers will be laid down if possible. Lightkeepers and mariners will govern themselves accordingly, and lightkeepers are cautioned to maintain their lights and fog alarms in operation until navigation shall have completely closed. They are required to satisfy themselves that navigation has completely closed before closing their stations. The keepers of the stations named above will maintain their lights in operation until they are called for by Government steamboat.

The Stranding of the s.s. Floriston.

Following is a summary of the judgment delivered by Capt. L. A. Demers, Dominion Wreck Commissioner, concurred in by Capts. F. Nash and Mathias, in connection with the striking of an iceberg by the s.s. Floriston, Aug. 29, in Belle Isle Strait, and her subsequent stranding west of Rich Point. The court, while exonerating the master of responsibility for collision with the iceberg, looks askance at his neglect in supplying his vessel with proper charts and sailing directions of recent issue, and also questions his extraordinary conduct when he stood off shore for two hours awaiting answer to his signals, and failed to send a boat in advance to enquire the most practical and advisable course to follow in beaching his vessel, which information, had it been sought, would, in all probability, have directed him to Port Saunders. Ordinary prudence demanded that the nature of the bottom should have been ascertained before driving the vessel ashore, and it is providential that, beached as she was on a rock bottom in an almost perilous position, an exceptional period of fine weather prevailed until she was refloated, and it therefore cannot be attributed to any seamanlike action of the master that she escaped ultimate disaster. The court severely reprimands the master, A. E. Kennedy, for his negligence. The master and second officer were also cautioned to be more careful, prudent and resourceful in future.

The hydraulic dredge Port Nelson, which was built at Polson Iron Works, Toronto, about a year ago for work in the Port Nelson harbor, Hudson Bay, was, after considerable delay, due to weather conditions, placed under operation, Sept. 28. She is making a channel into Port Nelson for the temporary docks to be built there.

The North Atlantic Conference and the the Uuited States Anti-Combine Laws.

In Jan., 1911, the U.S. Government commenced suit against the shipowning companies comprising the North Atlantic Conference, and also against a number of these companies' officials, complaining that they operated in restraint of trade. When the suit was originally entered, the Allan Line and the C.P.R. were included with the other defendants, but as it transpired at the trial, that both of these companies had withdrawn from the conference, prior to the date of the entry, they were dismissed from the action. Judgment was delivered in New York, Oct. 13, dismissing all of the Government's complaints with one exception, without costs to the defendants. The one complaint which was upheld, referred to what has been termed the "fighting ships," which, it is stated, were used to compete with vessels of lines not members of the conference and operating at lower rates than those charged by the conference members. The court stated that ostensibly they were operated by one of the members of the conference, but they were really supplied by the conference, the members thus cooperating to keep out competition. It is reported that the Government will probably take an appeal to the Supreme Court.

Since this action was entered upon, the European war has broken out, and as the more or less predominating influence in the conference was German, and as the German merchant fleet is now nonexistent, it is scarcely likely that the conference will be continued on the lines on which it was operated before. The action of the Canadian lines in withdrawing altogether from the membership and defying the strong combination, a few years ago, caused a considerable flutter in the shipping world.

Atlantic and Pacific Ocean Marine.

It is reported that the Osaka Shosen Kaisha is building in Japan, nine steamships aggregating 37,000 tons. Of these, two of 9,500 tons each, are stated to be for the company's Hong Kong-Vancouver service.

Furness, Withy and Co.'s s.s. Shenandoah, which stranded off Little Musquash, N.B., in September, is being repaired at Halifax, N.S. About 60 plates have to be replaced and repaired. The cost will be about $25,000.

It is reported that British interests are negotiating with the Great Northern Ry. for the purchase of the s.s. Minnesota. It is stated that it has not transpired whether the negotiators are the British Admiralty, the C.P.R., or the G.T. Pacific Ry.

The s.s. Elsinore, an oil tank vessel, which was reported recently to have been sunk by a German cruiser off the coast of Chili, was owned by C. T. Bowring and Son, of Liverpool, Eng., and Newfoundland. She was built in 1913, and had a tonnage of 6,542 gross and 4,169 register.

The C.P.R. has amended its claim for damages against the owners of the s.s. Storstad, in connection with the loss of the s.s. Empress of Ireland, by increasing the amount from $2,000,000 to $3,000,000, in order to meet any liability under actions for damages brought by relatives of the crew, and for other contingencies.

Canada Steamship Lines s.s. Bermudian, which is one of the vessels engaged recently in transporting the Canadian contingent from Quebec to England, is reported to have been requisitioned by the British Government to take troops from England to India to replace others which are leaving, or have left, for the front.

The C.P.R. and Allan Lines have raised the first class rates between Canada and Great Britain, by $10, and second class and third class rates by the Cunard and Donaldson Lines have been advanced $5 and $2 50. respectively. The increase of $20 in the first class rates which was made on the outbreak of war, was cancelled a few days after it was made, so that the present is the only increase which has really taken place.

A St. John, N.B., correspondent writes:—"The harbor works on the west side are being pushed with the greatest vigor in anticipation of an increased traffic in grain and other food stuffs between Canada and Great Britain during the approaching winter. The new pier which will probably be utilized by the steamers of the C.P.R. will be ready for business by Dec. 1. A monster warehouse is now in course of erection, and an elaborate scheme of reclamations is being carried out with a view to providing enlarged trackage facilities."

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during September.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	331	6,628	6,959
Grain	"	Bushels	2,487,115	3,102,896	5,590,011
Building stone	"	Short tons	.....	.....	.....
Flour	"	Barrels	354,730	1,226,510	1,581,240
Iron ore	"	Short tons	3,739,871	1,549,937	5,289,808
Pig iron	"	"	.....	2,138	2,138
Lumber	"	M. ft. b.m.	1,819	58,146	59,965
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	15,458,520	6,211,090	21,669,610
General merchandise	"	Short tons	15,990	15,261	31,251
Passengers	"	Number	1,095	1,952	3,047
Coal, hard	Westbound	Short tons	20,847	142,063	162,910
Coal, soft	"	"	296,475	1,427,127	1,723,602
Flour	"	Barrels	.....	145	145
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	4,901	10,380	15,281
Iron ore	"	"	.....	.....	.....
Salt	"	Barrels	2,828	66,800	69,628
General merchandise	"	Short tons	31,028	103,048	134,076
Passengers	"	Number	1,374	1,420	2,794
Summary.					
Vessel passages		Number	850	1,846	2,696
Registered tonnage		Net	2,851,631	3,551,372	6,403,003
Freight—Eastbound		Short tons	4,312,430	2,055,978	6,368,408
" —Westbound		"	356,655	1,692,653	2,049,308
Total freight		"	4,669,085	3,748,631	8,417,716

The C.P.R. s.s. Missanabie sailed from Liverpool, Eng., on her maiden trip to Montreal, Oct. 7, and left for England again on Oct. 22. She is 520 ft. long, 64 ft. wide and 40 ft. deep, with a gross tonnage of 13,000 tons, and cargo capacity of 400,000 cubic feet. She is of the one class cabin type, with accommodation for 520 cabin, and 1,200 third class passengers. Capt. G. C. Evans, formerly of the company's s.s. Lake Manitoba, is in command. A full description of the vessel has already appeared in Canadian Railway and Marine World.

The total of the fund raised for the benefit of dependents on those who lost their lives in the Empress of Ireland disaster is £90,000, which has been paid over to the public trustee in England, who is formulating a scheme of disbursement similar to that adopted at the time of the loss of the Titanic. About 350 claims have been filed, exclusive of Canadian ones, which are comparatively few. It is stated that payments will be made weekly to British claimants in Great Britain, from amounts invested, and by lump sums to Canadians, while certain German claims will be ignored.

The Uranium Steamship Co., which has for some time been operating a steamship service between New York and Rotterdam, Holland, has discontinued operations during the war. This company, which is closely allied with the Canadian Northern Ry. interests, owned the steamships Uranium, Campanello and Principello. The Uranium has been laid up for the present, and the other two vessels have been taken over for operation by Canadian Northern Steamships, Ltd., to fill the vacancies caused by the withdrawal of the steamships Royal Edward and Royal George, requisitioned by the British Admiralty for war service.

The first case to be heard under the Workmen's Compensation Act in England in connection with the Empress of Ireland disaster, was decided in favor of the company recently, in the Liverpool County Court, when Quartermaster Galway, whose evidence in the enquiry at Quebec was severely commented on by Lord Mersey, claimed compensation on the ground that he had contracted pleurisy and neurasthenia as a result of long immersion in cold water. After hearing his evidence, the judge gave judgment in favor of the C.P.R., remarking that he was not satisfied that the applicant at any time suffered as a result of the accident, and that his evidence both in Quebec and Liverpool, was inconsistent.

The British Admiralty has issued the following notice,—For purposes of national defence it is considered necessary that certain channels in the approaches to the Thames should be closed. All incoming vessels flying foreign flags and all British vessels from all foreign and colonial ports must call at the new pilot station in the vicinity of the Tongue lightvessel, or at one of the established pilot stations, viz.,—the Sunk lightvessel, Margate, Deal and Dover, and be conducted to their destinations by a licensed pilot. All outgoing vessels of the same description must before sailing obtain the services of a licensed pilot to conduct them to sea. All incoming vessels not included in the above, before leaving their port of departure for the Thames, and all similar outgoing vessels, must obtain instruction from the nearest Customs authorities as to the channels to be used.

The steamships Brindilla and Platuria, which were recently transferred from the German to the U. S. register, under the new law relating to foreign built vessels, have been taken into British ports and held, on the ground that the transfer of German vessels to the register of a neutral country during the war is not legal, and is a breach of the London Convention. These vessels with the s.s. J. D. Rockefeller, were engaged in conveying oil to neutral ports. The J. D. Rockefeller was also held, but was subsequently released as the British authorities were satisfied as to the destination of the cargo. The question of the two vessels still detained has been dealt with through diplomatic channels and the vessels released. The Brindilla was formerly named Washington, and was built in Stettin, Germany, in 1894; the Platuria, formerly Diamant, was built at Newsastle, England, in 1892.

Maritime Provinces and Newfoundland.

The C.P.R. has withdrawn its s.s. St. George from the Bay of Fundy service for the winter, the service being performed by the s.s. Yarmouth on a daily schedule, excepting Sundays.

The Dominion Government has entered an action against the s.s. Lingan, owned by Furness, Withy and Co., and under charter to the Dominion Coal Co., for the sinking of the s.s. Montmagny. It is stated that the claim is for $400,000.

The Charlottetown, P.E.I., Board of Trade had under consideration at its meeting on Oct. 14, the constitution of a pilotage district and local pilotage authority for Charlottetown. After considerable discussion it was decided to refer the question to the Board's council for further consideration.

A proclamation has been issued declaring Belle River, P.E.I., to be a port, the limits covering the waters of the Strait of Northumberland and all the navigable waters of the Belle River inside of the depth of five fathoms at low tide, bounded east and west by lines drawn parallel to one quarter statute mile distant from the east face of the west breakwater at the mouth of the river.

The Steamship Cacouna Co.'s s.s. Cacouna, which ran ashore at Hare's Ears, Ferryland Head, near St. John, N.B., at the latter end of September, has become a total loss. She was built at Newcastle upon Tyne, Eng., in 1884, and was screw driven by engine of 142 n.h.p. Her dimensions were, length, 250 ft., breadth 35.4 ft., depth 16.4 ft.; tonnage, 1,451 gross, 931 register. The Steamship Cacouna Co. is a subsidiary of the Black Diamond Steamship Co.

Judgment was delivered at St. John, N.B., Oct. 1, on a claim by R. M. G. Walford against Wm. Thomson and Co., insurance agents, for balance of $500 due on a claim under an insurance policy issued on the brigantine Marconi, lost at sea, Nov. 27, 1911. It was claimed by the defendants that they issued the policy as agents for underwriters in England, and that it was not binding on them personally, and that throughout the transaction they had merely acted as agents, and that the renewal of the policy, under which renewal the vessel was lost, was not made under the correct conditions of the original policy providing such renewal. Judgment was given in favor of the plaintiff, it being held that the defendants were personally liable.

The Toronto Harbor Commissioners have officially announced that the works under their jurisdiction will proceed without interruption, there being ample funds on hand for all purposes.

MARINE NOTES.—Shipping moves freely, except Austrian and German.—Financial Times, Montreal.

Province of Quebec Marine.

Capt. J. A. Vibert, a former deputy port warden of Montreal, died at Westmount, Que., Oct. 1, aged 87.

Montreal press reports state that the Harbor Commissioners are considering the extension of their no. 2 elevator, at an approximate cost of $800,000.

The Davie Shipbuilding and Repairing Co., of Lauzon, has, during this year completed for the Marine Department, six scows, each with hopper capacity of 300 cubic yards. The dimensions of each are, length inside of fenders 104 ft., breadth moulded 28 ft., depth moulded 9 ft.

The Department of Marine has placed a gas buoy, colored green and showing a white light occulting at short intervals, about 150 ft. northward of the wrecked s.s. Montmagny, which sank in the Beaujeu Channel, River St. Lawrence, after colliding with the s.s. Lingan, Sept. 18.

Press reports from Montreal, Oct. 16, stated that the Montreal Harbor Commissioners after having received complaints from Great Britain as to shortage in grain cargoes, have held an inquiry and as a result have dismissed four employes. It is stated that the total thefts amount to about 8,000 bush. of oats.

Canada Steamship Lines s.s. Quebec received slight damage when the s.s. W. H. Dwyer backed into her while raising her anchor in Lake St. Peter, Oct. 11. The damage was repaired at Sorel, and during the few days the Quebec was off her run between Montreal and Quebec, her place was taken by the s.s. Murray Bay.

It is announced that the offices of the Quebec Steamship Co., at Quebec, which were taken over by Canada Steamship Lines, Ltd., on the absorption of the former company, have been closed, and the staff transferred to the head office at Montreal. It is stated that A. Ahern, who was Manager, Quebec Steamship Co., for many years, will be superannuated.

The Montreal Harbor Commissioners have commenced an action against the s.s. Cairnross for $25,000 damages for the sinking of a scow on which was a large stone crusher and concrete mixer. The accident occurred on Oct. 6, when the Cairnross was proceeding to her berth at shed 15. It is said that the Commissioners are to raise the machinery and ascertain the exact amount of damage sustained.

Canada Steamship Lines s.s. Louis Philippe, the launching of which, from the yard of the Davie Shipbuilding and Repairing Co., Lauzon, was mentioned in our last issue, is intended for service in Montreal harbor between Montreal and Longueuil, during the summer, and in the lower St. Lawrence in the winter. She has been specially built for such service, and the dimensions are, length 169.6 ft., breadth moulded 43 ft., depth of hold 12.3 ft. The propelling machinery consists of reciprocating engines of 500 h.p. supplied with steam by one Scotch boiler.

A report is stated to be ready for presentation to the Montreal Board of Control, relating to the proposed municipal ferry service between Montreal and St. Helen's Island. It is estimated that the cost of a steel ferry steamboat, with capacity for about 1,000 passengers, will be $65,000. The vessel would be double ended, with two decks, arranged for embarking and disembarking passengers from both levels. It is ultimately intended to have two vessels, one operating from the east end, and one from the west end, but it is stated that only one will be proceeded with at first.

The Corporation of Three Rivers s.s. Le Progres, which was launched from the Davie Shipbuilding and Repairing Co.'s yards at Lauzon, recently, is of the following dimensions, length between perpendiculars 126.6 ft., breadth 32.4 ft., depth 12.2 ft. She is equipped with compound engines with cylinders 15 and 30 ins. diar., by 22 ins. stroke, supplied with steam by one boiler 11¼ ft. diar. by 9½ ft. long, at a pressure of 150 lbs. The engine is of 425 i.h.p., and the vessel is propelled by a single screw at about 11½ knots an hour. The hull has been built extra strong, so that she can be used for ice breaking in the winter. There is accommodation for about 450 passengers, in addition to room for cattle, horses and general cargo.

Ontario and the Great Lakes.

Canada Steamship Lines closed its Niagara River season, Oct. 17.

Capt. T. Sullivan, a veteran lake mariner, died at Toronto, Oct. 21, aged 80.

Capt. S. H. Burnham, a well known lake mariner, died at Port Huron, Mich., Oct. 2, aged 77.

John Lally, lock master on the Cornwall Canal at Cornwall, died there, Sept. 30, after a short illness.

A weather reporting station has been opened at Sarnia, for the supply of information to vessels passing up and down.

John Laxton has been appointed as the Dominion Government nominee on the Toronto Harbor Commission, succeeding F. S. Spence.

Capt. S. Burnham, who died at Port Huron, Mich., Oct. 1, was, until recently, master of the Pere Marquette Rd. car ferry at Detroit.

From a note left behind in his office, it is feared that E. Geddes, freight agent, Canada Steamship Lines, Lewiston, N.Y., has committed suicide.

The s.s. Grenville, which is being built at Polson Iron Works, Toronto, for the Dominion Government lighthouse service in the St. Lawrence River between Lake Ontario and Coteau, will be launched about Nov. 9.

The Canadian Stewart Co.'s steam tug Emslie Stewart was launched at Toronto, Oct. 10. She is of steel, 80 ft. long, and the hull is divided into four compartments with watertight bulkheads. When completed she will be utilized in connection with the Toronto harbor improvements, for which the owners have the contract.

A third lock in the United States canal at Sault Ste. Marie, was opened Oct. 21. The lock is the largest in the world, the dimensions being, 1,250 ft. long by 80 ft. wide with a draught of 24½ ft. It will accommodate any two of the largest vessels on the Great Lakes. The cost of the work is somewhat over $6,000,000.

The ice breaking steamship J. T. Horne, which, as reported in our last issue had been purchased by the Russian Government for service in Russian waters, was inspected at Montreal, early in October by a member of the Russian Embassy at Washington, D. C. It is stated that she will be utilized in the neighborhood of Archangel.

The Mathews Steamship Co.'s s.s. Edmonton, while bound to Montreal with flour during the first week of October, struck a submerged object near Morrisburg, and was beached to avoid sinking. Some temporary repairs were undertaken to enable her to reach Montreal. The accident is stated to have been due to low water on the route between Montreal and Port Colborne.

Canada Steamship Lines s.s. Juno, which was acquired when the company took over the Richelieu and Ontario Navigation Co., but which has not been operated for several years, is being dismantled at Toronto. She was built at Wallaceburg, Ont., in 1885, and was screw driven by engine of 170 n.h.p. Her dimensions were, length 139.7 ft., breadth 26.8 ft., depth 8.8 ft.; tonnage, 288 gross, 196 register.

Engineers were in Owen Sound recently inspecting sites for the location of the projected dry dock and ship repair plant. This matter has been before the public in many shapes for several years without anything being achieved, and even local people appear to be somewhat pessimistic as to anything being done in the immediate future. The strongest statement used in commenting on the project, is that "it would appear as though the realization of the long considered project is nearer than it has ever reached before."

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for September, as follows,—Superior 602.80; Michigan and Huron 580.48; Erie 572.37; Ontario 246.09. As compared with the average September levels for the past ten years, Superior was 0.07 ft. above; Michigan and Huron 0.41 ft. below; Erie 0.07 ft. below, and Ontario 0.25 ft. below. It was anticipated that during October the level of Superior would remain stationary; Michigan and Huron would fall 0.2 ft.; and Erie and Ontario 0.3 ft.

The s.s. Howard M. Hanna Jr., formerly owned by the Hanna Transit Co., Cleveland, Ohio, and which was wrecked in the Great Lakes storm of Nov., 1913, has been purchased from the Reid Wrecking Co., Sarnia, Ont., who acquired the wreck and raised her, by the interests with which Jas. Playfair, Midland, Ont., is associated. The vessel has been thoroughly overhauled and repaired at Collingwood. The shipowning company with which Mr. Playfair is interested is the recently incorporated Great Lakes Transportation Co., of Midland, which has a capital of $1,000,000. With him in the company, are associated, H. W. Richardson, Kingston, D. L. White and F. W. Grant, Midland, and W. J. Sheppard, Waubaushene, Ont.

Manitoba, Saskatchewan and Alberta.

The dry dock which has been built at Selkirk, Man., for the accommodation of the Government vessels on the lake, was opened Oct. 20.. It is stated that it will also be used for general shipping.

The Canadian Shipping Co., Ltd., has been incorporated under provincial letters patent, with $25,000 capital stock, and office at Winnipeg, to own and operate steam and other vessels, to act as agents for other vessel owning companies, and to carry on a general navigation business. F. S. Andrews, W. H. Curle, D. L. Bastedo, L. T. S. Norris-Elye and L. D. Morosnick, Winnipeg, are the incorporators.

British Columbia and Pacific Coast Marine.

The C.P.R. has discontinued its direct steamship service between Victoria and Tacoma, Wash., for the winter.

The Department of Marine has awarded a contract for the construction of a lighthouse on Bonila Island, in the British Columbia outside channel, to Weldon and Talbot, New Westminster. It is unlikely that the light will be placed until the spring, owing to the storms which sweep the island during the winter.

The G.T. Pacific Coast Steamship Co.'s s.s. Prince Albert, which was wrecked in Brown's Passage, Aug. 18, and which was reported to have been abandoned as a total loss, was subsequently salved and taken to Esquimalt for examination, and later to North Vancouver, where she will be repaired. Sixty shell plates will have to be replaced, besides other repairs. It is expected that she will be again ready for service about the end of November.

The G.T. Pacific Coast Steamship Co.'s autumn schedule, which became effective Oct. 4, covers the s.s. Prince George, leaving Seattle, Wash., on Sundays, calling at Victoria and Vancouver, Mondays, Prince Rupert, Wednesdays, Anyox and Stewart, Thursdays, and returning to Seattle by the same route on Sundays; the s.s. Prince John, leaving Vancouver on Fridays for Prince Rupert and Island ports and returning to Vancouver on the following Tuesday week; and the s.s. Henriette, for freight only, as directed.

The enquiry into the causes of the collision between the C.P.R. s.s. Princess Victoria and the Alaska Pacific Navigation Co.'s s.s. Admiral Sampson, conducted by two United States Steamboat Inspectors recently, resulted in the statement that as both vessels were running under rule 13 of the pilot rules for inland waters of the Atlantic and Pacific Coasts and the coast of the Gulf of Mexico, and from the evidence adduced the inspectors were of opinion that neither of the vessels were in compliance with the rule, and therefore both were to blame. Since the only action which the local inspectors can take would be to revoke the license of the officer in charge of the s.s. Admiral Sampson, those on the Princess Victoria not being under U.S. jurisdiction, and as the officer in charge of the Admiral Sampson went down with his vessel, no penalty will be imposed. The investigation by the Canadian authorities exonerated the officers of the s.s. Princess Victoria from all culpability in connection with the collision.

The C.P.R. s.s. Princess Margaret, which has just been completed on the Clyde, Scotland, for service on the British Columbia Coast, underwent her dock trials about the middle of October, and it was announced that she would be sent on her speed and other trials about the end of that month. The sister vessel, Princess Irene, is still on the ways, and J. W. Troup, Manager British Columbia Coast Service, C.P.R., was reported to have stated recently, that though the vessels would not arrive at the coast as soon as was originally expected, they would in all probability be there ready for service in the spring.

Directory of Canadian Ports and Harbors.—The Department of Marine has issued a directory containing information about a great number of harbors throughout the Dominion, both maritime and inland. The information is intended to afford mariners generally definite knowledge of harbors and aids to navigation, and covers descriptions of the power and order of lights, of fog alarms, buoys and submarine warnings, and also tides and currents and life saving and radio telegraph stations. Brief descriptions are included of the Hudson Bay and Strait, with approximate length, breadth and depth of these waters, and references indicating the natural harbors affording shelter in the strait and along the coast of Baffin Island. This is the second port directory issued by the Department, the first one having been confined to descriptions of harbors where not less than 50,000 tons of shipping had entered during the year of publication.

The Transportation of Canadian Troops to Europe.

The work of transporting the 30,000 odd members of the first Canadian contingent for war service in Europe, from Valcartier, Que., to Salisbury Plain, England, has been carried out in an eminently satisfactory manner. The gathering of the requisite number of suitable vessels was a considerable task, and the loyal cooperation of the owning companies was undoubtedly one of the main factors in its accomplishment.

The first of the troops left the camp at Valcartier, Sept. 22, and the last of the transport vessels from Quebec, Oct. 1. The troop trains were run down direct to the Louise embankment, and the loading of the vessels proceeded night and day. Thirty steamships were used for the Canadian contingent, and one vessel, the s. s. Florizell, was picked up later, conveying the Newfoundland contingent. The vessels used, with their respective owning companies, are as follows:—

Allan Line—Corinthian, Grampian, Scandinavian, Scotian, Sicilian, Tunisian and Virginian.

Canadian Northern Steamships—Royal Edward, Royal George.

Canadian Pacific Ry.—Montezuma, Montreal, Monmouth, Ruthenia, Tyrolia.

Cunard Line—Franconia, Ivernia, Laconia, Saxonia.

Cunard-Thomson Line—Alaunia, Andania.

Canada Steamship Lines—Bermudian.

Donaldson Line—Athenia, Cassandra.

Furness, Withy and Co.—Manitou.

Red Star Line—Lapland, Zealand.

Royal Mail Steam Packet Co.—Arcadian, Carribean.

White Star Line—Laurentic, Megantic.

The last of the transports sailed from Quebec early on Oct. 1, and the whole of the fleet assembled at Gaspe Bay, which had been made the rendezvous, for final arrangement of the lines and convoys. While this was being carried out, a final message by the Governor General was distributed, together with mail matter, etc. The fleet was also joined at this point by the White Star-Dominion Line s. s. Canada carrying the Lincolnshire Regiment which had been on garrison duty at Bermuda.

The fleet of transports was formed into three columns for convoy across the ocean, as follows:—Column Z,—Alaunia, Bermudian, Cassandra, Florizel, Ivernia, Lapland, Megantic, Montezuma, Ruthenia, Scandinavian, Sicilian; convoy, H. M. S. Eclipse.

Column Y,—Athenia, Canada, Carribbean, Franconia, Laurentic, Manitou, Monmouth, Royal Edward, Tunisian, Tyrolian; convoy, H. M. S. Diana.

Column X,—Andania, Arcadian, Corinthian, Virginian, Zealand; convoy, H. M. S. Charybdis (flagship); Grampian, Laconia, Montreal, Royal George, Saxonia; convoy, H. M. S. Glory.

The foregoing formation was maintained until near the British coast, the vessels proceeding with distance of about 1½ miles between, the whole fleet covering an area of about 15 square miles. Other warships joined the fleet in the Gulf of St. Lawrence, these being engaged in the patrol of the North Atlantic, and they returned to their former duty from mid ocean. In addition to the warships, the steamships Royal George and Laurentic, the two fastest vessels of the fleet were utilized as scouts. When nearing the British Coast, the two vessels bearing the Army Service Corps were detached from the main body and sent ahead to assist in the general landing, in charge of H. M. S. Diana, whose place was taken by H. M. S. Majestic. The strictest care was taken to prevent attack of whatsoever nature, and the voyage was accomplished in perfect safety. The troops arrived at Plymouth, Oct. 14, where they landed and entrained for the training camps on Salisbury Plain.

The Empress of Ireland Disaster.—In connection with the C.P.R. claim for $3,000,000 damages for the loss of the s.s. Empress of Ireland, which was run down by the s.s. Storstad, the owners of the latter vessel applied at the Admiralty Court at Montreal, Oct. 19, for an order for the C.P.R. to produce the official log book of the s.s. Montrose on her several voyages between Montreal, Quebec and Liverpool, while under the command of Capt. Kendall, who was in charge of the Empress of Ireland at the time of the disaster; also for a list of all survivors of the crew on watch in all departments at the time of the collision, and for the appointment of a commission in England to take the depositions of one of the passengers. The defendants also demanded admission that at the date of the collision, the Storstad was the property of the Actienelskabet Maritime, a corporation with office in Christiania, Norway, and also that by reason of the collision, the Storstad suffered damage.

Lift Bridge for Toronto Harbor. — The Toronto Harbor Commissioners are making preparations for the construction of a lift bridge to carry Cherry St. over the Don River, within the zone of the improvements to be made by the Commission. It is to be of a lift type to permit vessels to pass from the harbor to beyond Cherry St., but it has not yet been decided whether it will be a rolling lift bridge or a bascule bridge. It is expected that an early decision will be arrived at in order that the work may go on without delay. It will have a clear span of 80 ft., it will be 66 ft. wide, and in addition to provision for vehicular and pedestrian traffic along each side, will have a double street car track down the centre.

Submarine Mines in the North Sea.—The British Admiralty has issued the following notice:—The German policy of mine laying, combined with their submarine activities, make counter measures necessary on military grounds. His Majesty's Government has therefore authorized a mine laying policy in certain areas. To reduce risks to non-combatants, the Admiralty announces that it is dangerous for vessels to cross the area between latitudes 51 deg. 15 min. and 51 deg. 40 min. north, and longitudes 1 deg. 35 min. and 3 deg. east. The southern limit of the German mine limit is 52 deg. north, but it is not supposed that navigation is safe in any part of the southern waters of the North Sea.

Regulations Regarding Deck Loading.—Following on the lead given by the British Government, the Dominion Government has amended the regulations governing the loading of timber on vessels, so as to allow of the exportation of pit props to Great Britain, where they are urgently needed. The Marine Department has been advised that masters or owners of vessels arriving at ports in the United Kingdom from Canadian ports between Oct. 31 and Nov. 15, with summer deck loads of wood goods, will not be proceeded against by the Board of Trade. The Department has therefore decided to allow steamships to load accordingly in Canada, up to Nov. 7.

G. H. Flood has been appointed Purchasing and Contract Agent, Marine & Fisheries Department, Ottawa, vice C. Doutre, resigned.

In acknowledging a correction of a news item recently, the Montreal Daily Mail refers to J. A. Farquhar of the s.s. Seal, as the "managing editor of the s.s. Seal."

The Stranding of the s.s. Monkshaven.

Capt. L. A. Demers, Dominion Wreck Commissioner, has given the following judgment re the stranding of the s.s. Monkshaven, a steel built single screw vessel, on Roix Shoal, in the St. Lawrence River, about a mile from Ste. Felicite, Que., on Aug. 23, it being concurred in by Capt. F. Nash, and Capt. Jas. Murray, Harbor Master of Quebec:—

The court having carefully weighed the evidence adduced is unanimous in its conclusion that while the absence from the bridge of the master, J. E. Millburn, at the time of the accident is not interpreted as neglect, in view of the fact that clear weather prevailed and a properly certificated officer represented him on the bridge, it is nevertheless held that the master relied too implicitly on cursory observations, instead of employing the recognized authentic and reliable methods of ascertaining the exact position of his vessel, for which neglect the court finds it incumbent upon it to censure him. As for the chief officer, P. Gaige, who was in charge of the bridge at the time of the stranding, it is held that he did not exercise due precaution in availing himself of the opportunities offered to determine the position of his ship, which failure is all the more pronounced by the fact of his knowingly approaching a charted shoal, and for his negligence in the exercise of his duty the court severely censures and reprimands him. It is further held that R. W. Thoburn, the second mate, did not comply with the exigencies of his duty in the matter of obtaining adequate fixes to place the exact position of his ship, for which he is censured. The court desires to caution the master and first and second officers to exercise adequate and precise navigation methods in the future in order to insure the safety of their ship, for in merely reprimanding them as above the court holds that they have been leniently dealt with under the circumstances.

Additional Steamships for C. P. R. Atlantic Service.—We are officially advised that the C. P. R. has under consideration, the ordering of two additional steamships with a speed of 20 knots an hour, for its Atlantic service.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

H. H. Westinghouse has been elected President of the Westinghouse Air Brake Co., Pittsburg, Pa., to succeed his brother, the late George Westinghouse.

Canadian Westinghouse Co., Ltd., Hamilton, Ont., has issued from its railway and lighting department circular 506 Westinghouse Turbo-Alternators, 40 pgs., 7 by 10 ins., illustrated.

The Pedlar People, Ltd., Oshawa, Ont., have sold the White Valley Irrigation and Power Co., of British Columbia, about 9,000 ft. of metal flume, varying from 30 to 61 ins. in diameter, for the completion of the Grey Canal.

Independent Pneumatic Tool Co., Chicago, has appointed V. W. Robinson representative in Michigan, with headquarters at Detroit. F. J. Passino, heretofore Michigan repre-

sentative, has been appointed representative in the southwest, succeeding H. F. Finney, promoted to a position in the General Sales Office in Chicago.

Canadian General Electric Co., Toronto, has issued the following publications:—Bulletin 42500, synchronous converters for railway, lighting and industrial service; bulletin 906, electric hoists for the efficient handling of all loads, catalogue, H. & H. barrier 600 volts switches for electric railway cars, to control the air brake, headlight, heater and incandescent circuits.

Butterfield & Co., Inc., Rock Island, Que., and Derby Line, Vt., manufacturers of screw plates, are placing on the market the combined automibile screw plate, which contains taps and dies, cutting the S.A.E. standard, and also the regular V thread, or the U.S. standard, as may be wanted, all complete with stocks for holding the dies, and high grade tap wrench, in hardwood case. The claim made for this plate is that heretofore the repair and garage man wanting both forms of thread, was obliged to buy two distinct screw plates, whereas now he gets both styles in one box, and at a reasonable price. These plates are put out in all the various assortments, cutting from ¼ to 1 in., and are made in the Derby plate.

Transportation Conventions in 1914-15.

Nov. 17.—National Association of Railway Commissioners, Washington, D.C.
Nov. 17-19.—Maintenance of Way and Master Painters' Association of the United States and Canada, Detroit, Mich.
Nov. 18.—American Railway Association, Chicago, Ill.
Dec. 1-4.—American Society of Mechanical Engineers, New York.
Dec. 8, 9.—Association of Transportation and Car Accounting Officers, Richmond, Va.
Jan. 19-21.—American Wood Preservers' Association, Chicago, Ill.
Mar. 16-18.—American Railway Enginecring Association, Chicago, Ill.
April.—American Association of Demurrage Officers, Boston, Mass.
Apr. 28.—Association of American Railway Accounting Officers, Atlanta, Ga.
May.—Association of Railway Claim Agents, Galveston, Tex.
May 4-7.—Air Brake Association, Chicago, Ill.
May 17-20.—International Railway Fuel Association, Chicago, Ill.
May 21-24.—American Association of Freight Agents, Richmond, Va.
June 15.—Train Dispatchers' Association of America, Minneapolis, Minn.
June 16.—Freight Claim Association, Chicago, Ill.
June 22-25.—Association of Railway Telegraph Superintendents, Rochester, N.Y.
July 14-17.—International Railway General Foremen's Association, Chicago, Ill.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries.
Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.
Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.
Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.
Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.
Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.
Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.
Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.
Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto, 3rd Tuesday each month, except June, July and August.
Dominion Marine Association, Counsel, F. King, Kingston, Ont.
Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.
Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.
Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.
Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.
International Water Lines Passenger Association, M. R. Nelson, New York.
Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.
Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.
Quebec Transportation Club, A. F. Dion, Quebec.
Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.
Toronto Transportation Club, W. A. Gray, 143 Yonge St., Toronto.
Western Canada Railway Club, Louis Kon, Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July and August.

TENDERS.

TENDERS addressed to the undersigned at Ottawa, and marked on the envelope "Tender for Ice-breaking," will be received up to twelve o'clock noon of the SIXTH DAY OF NOVEMBER, 1914, for breaking ice in the Harbors of Port Arthur and Fort William, Thunder Bay, Lake Superior, in accordance with the specifications prepared by the Department of Marine and Fisheries. A contract will be entered into with the successful tenderer for a period of three years, but the tenderers must quote a price per annum.

Specifications of the work required can be obtained from the Harbormasters at Port Arthur and Fort William and from the Purchasing Agent of the Marine Department, Ottawa. There are no special tender forms for this work.

Each tender must be accompanied by an accepted cheque on a chartered Canadian Bank for a sum equal to 10% of the tender price per annum, which cheque will be forfeited if the successful tenderer declines to enter into a contract or fails to complete the work in accordance with the specifications of the Department. Cheques will be returned to unsuccessful tenderers.

The Department does not bind itself to accept the lowest or any tender.

Newspapers inserting this advertisement without authority will not be paid for same.

A. JOHNSTON,
Deputy Minister of Marine and Fisheries.

Department of Marine and Fisheries,
Ottawa, Canada, 28th September, 1914.

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BY USING THE
TATE FLEXIBLE STAYBOLT

TIME HAS DEMONSTRATED

FIRST—That flexible staybolts produce more satisfactory and more economical results than rigid staybolts.

SECOND—That TATE FLEXIBLE STAYBOLTS are best of all, measured by every standard.

Ask for our New Catalog just issued

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CANADIAN ALLIS-CHALMERS, Limited, General Offices, TORONTO, ONT.

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MAZDA LAMPS

For Steam or Electric Passenger Cars

YOU don't have to change your batteries so frequently when you use Northern Light Mazda Lamps. They will give the most light for the least battery consumption of any lamps now on the market, and are specially made for railway service.

Northern Light Mazda Lamps give that pure white brilliant effect that is so essential in railway coaches. They set off the interior furnishings of the cars to perfection, and will make the journey more cheerful and pleasant for your patrons.

Their rugged construction, brilliant illumination and long life, make them the ideal lamp for all railroad coaches, whether steam or electric.

Equip some of your cars with these lamps, and give them a thorough try-out in actual service.

Our nearest house can supply your needs and furnish attractive prices for Northern Lights in quantity lots.

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Line Construction Material

POLES, CROSS-ARMS, INSULATORS, WIRE LINEMENS' TOOLS, GALVANIZED HARDWARE.

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No material is sold under that name unless it has been subjected to thorough investigation of its quality.

Every piece of line material is manufactured under the most rigid specification and careful supervision.

All of which means that a line of Northern Electric line material will stand the test of time and weather.

We can sell you whatever you need for your lines.

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Where Quality and Reliability Count

Northern Electric Railway Signal Wire was used in connection with the recent installation of the Union Switch and Signal Company's A.C. Automatic Signals on the famous old Victoria Bridge

Our Railway Signal Wires, either weather-proof, rubber covered or bare, are made not simply to meet the "R.S.A." specifications but also to uphold our reputation as the largest and most reliable manufacturers of wires and cables of all kinds

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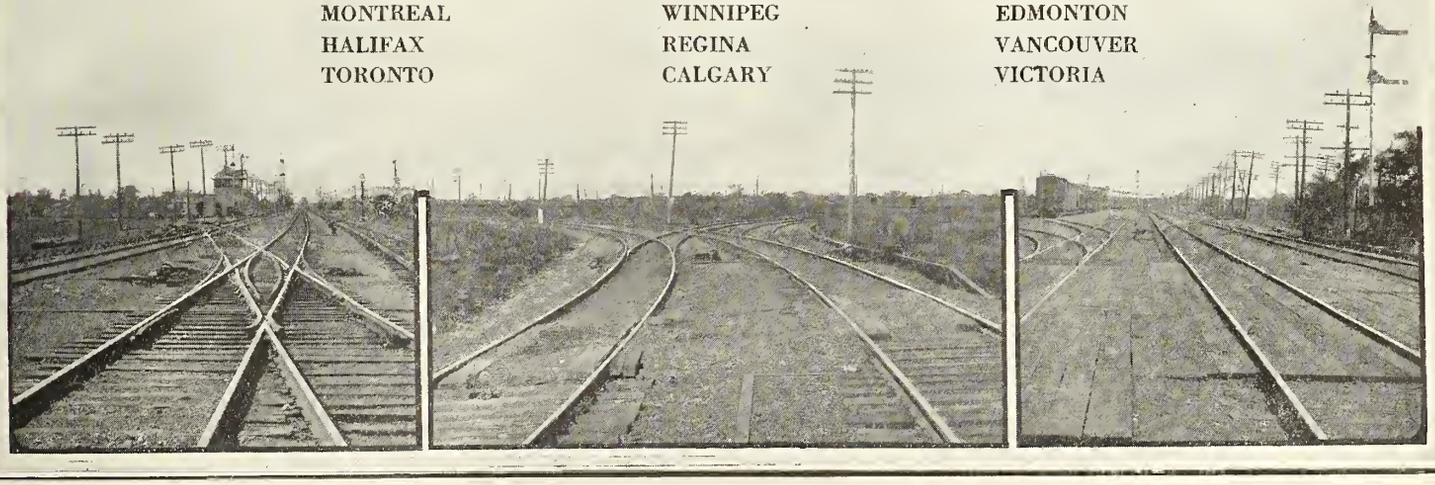

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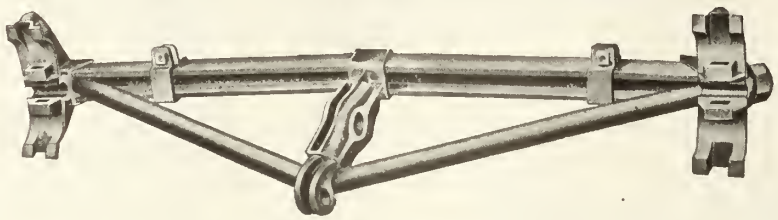

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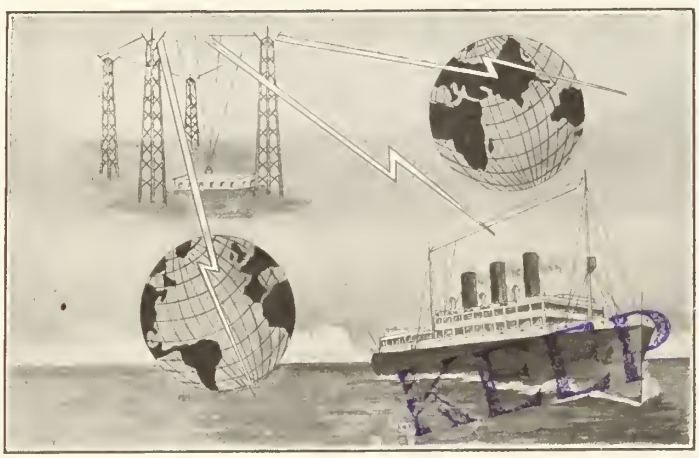

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Have you considered the advantage of connecting up factory or mine to head office by wireless? We will sell or rent you a system to cover all your requirements.

Of the world's wireless stations 75% are MARCONI.

CONSULT: "MARCONI" THE WORLD-WIDE WIRELESS

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The Parmelee Pipe Wrench

PRICE LIST C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths	
10 in.	1	⅜, ½, ¾, 1 in.	$5.00	$2.25	⅜, ½, ¾, 1 in.	$ .75
20 in.	2½	¾, 1, 1¼, 1½, 2 in.	7.50	2.50	¾, 1, 1¼ in.	1.00
					1½, 2 in.	1.25
25 in.	3½	1½, 2, 2½, 3 in.	7.50	3.00	1½, 2, 2½, 3 in.	1.25

Prices on larger sizes furnished upon application.

Rice Lewis & Sons, Ltd.

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"The Toothless Wonder"

DESIGNED ESPECIALLY to handle pipes spaced closely as in coil work. No. 2½ wrench illustrated requires but three-quarter inch space between pipes.

POSITIVE GRIP instantly taken. Operates without lost motion in stroke of handle. Can be locked or released easily in any position on the pipe.

RATCHET-LIKE ACTION. Successive grips can be taken without having to hold the wrench on the pipe. By a slight twist of the handle, which is round and knurled, the wrench is locked in any position.

CAN'T CHEW. The Parmelee will make or break the tightest joints without injuring pipe or threads, as it has no teeth. The only wrench suitable for galvanized pipe.

CAN'T CRUSH. The Parmelee will grip, without crushing pipe that has become weakened by long use or exposure and separate hopelessly rusted joints, saving its cost many times over.

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Manufactured in Montreal

Made of the best standard staybolt iron, adding flexibility by process of making as shown above—closely approximating a rope structure.

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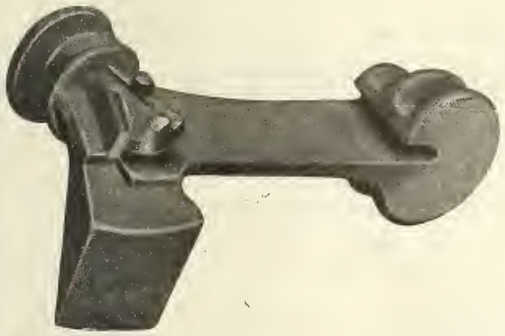

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Easily Applied

Absolute Efficiency

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Berry Brothers' extensive line of railway varnishes makes it possible for you to purchase the right varnish for any demand. Each varnish is made to give long lived service and wear under the most exacting conditions.

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A pale full bodied varnish that dries dust free quickly. It is an easy working varnish, and sets s owly permitting large panels to be handled perfectly. It is very durable, resisting wear and tear and dries with an attractive lustre.

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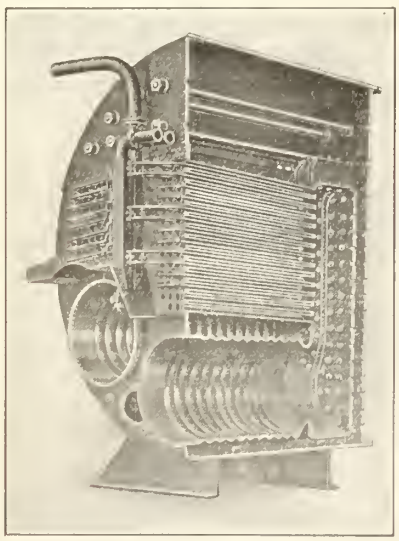
WALKERVILLE *World's Largest Varnish Makers* ONTARIO



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Saves from 10% to 25% of fuel per unit of power developed. Reduces coal bunker requirement, making possible increased revenue cargo with the same draft.

Increases power output of a given marine power plant from 10% to 25%.

Is adaptable to either new or existing boilers of the fire tube type, with no change in their design or construction.

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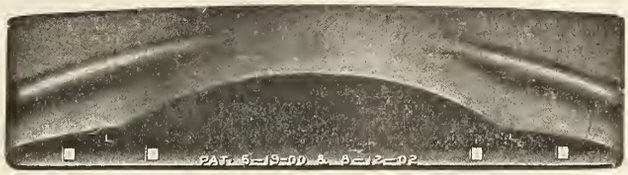

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Fewings Cast Steel Car Replacers,

St ong, Simple and Efficient,

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Use ordinary carbide—require no special attention—prices right. Let us send you catalog and prices.

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STRAIGHT LINE
COMPROMISE OR STEP
INSULATED FOR SIGNALS

Atlas Tie Plates Atlas Rail Braces

Atlas Special Joint—NOTE CUT

for pounded rail made to fit any style rail

Tee or Girder

Raises the worn or cupped rail to the level of the adjoining rail and holds it there. The rail is then ground even as shown. ATLAS SPECIAL JOINT made either suspended or supported. Ask for circular A-52.

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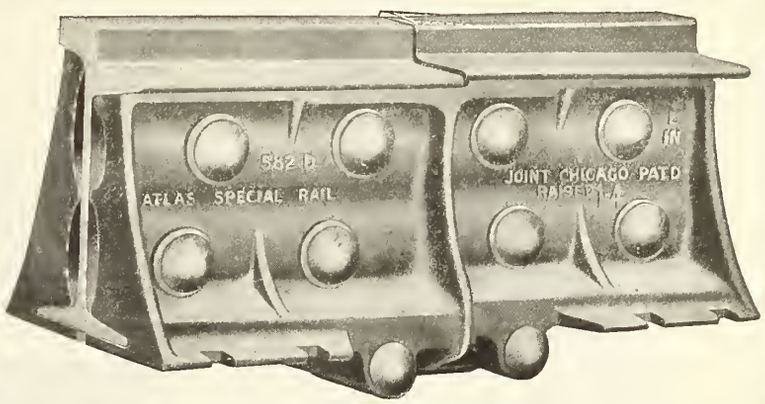
Dotted line shows the worn rail before it is ground off. This will renew the life of your rails.



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ADDITIONAL SAFETY AND ECONOMY IN TRACK MAINTENANCE

has been proved by the use of Continuous Weber and Wolhaupter base-supported rail joints—after fifteen (15) years' service, having a record of over 50,000 miles in use—the extent of which is evidence of their excellence. Made in Canada.

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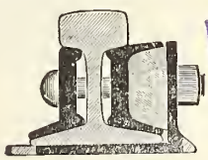
Continuous Joint.

Over 50,000 miles in use.



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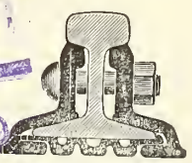
Rolled from Best Quality Steel



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THE RAIL JOINT COMPANY OF CANADA, LIMITED

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Makers of Base Supported Rail Joints for Standard and Special Rail Sections, also Girder, Step or Compromise, Frog and Switch, and Insulated Rail Joints protected by Patents.

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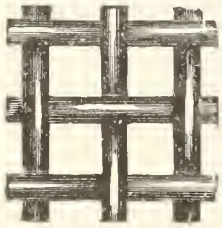

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COPPER VENTILATOR CLOTH FOR CARS

Wire Cloth of every description for all purposes.

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Manufactured by

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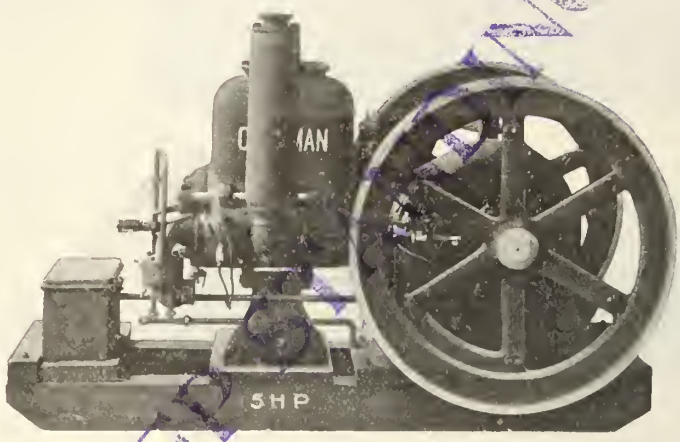

The Chapman gasoline engine is the last word in power development for operating pumps on contract work or railway station water tanks. The mechanical control cam is enclosed in a solidly constructed box, which can be removed and sent in to nearest branch, ensuring quick repairs. Write for catalogue.

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HERE we have a forged-steel lathe spindle 51 ⅛ inches long having six different diameters—each diameter must be ground positively accurate, perfectly finished. The wheel selected for the job is an

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No rough cut is taken—the wheel cuts so fast and clean that it finishes in one operation removing fifteen thousandths of stock—absolute accuracy is assured because the wheel holds its shape—and it cuts so fast that each spindle is ground in an hour.

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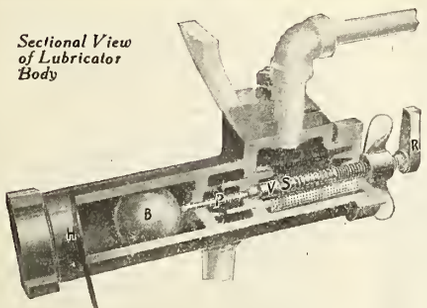

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An Automatic Flange Lubricator

The new Detroit Automatic Flange Lubricator gives efficient flange lubrication just when it is needed. The feed is governed entirely by the service requirements.

The complete lubricator consists of an oil tank or reservoir mounted in any convenient place, and a feed nozzle on the flange; between these is the lubricator body with a ball valve controlling the flow of oil from the tank to the flange.

The ball B rolls against the plunger P, opening the valve V and allowing oil to reach the flange whenever the locomotive acquires a swinging or rolling motion, as on curves.

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It never needs attention from the engineer as in the case of manually operated devices and starting and stopping at every curve are done away with. Nor does it take up any room in an already overcrowded cab.

It requires no steam and therefore cannot freeze. The absence of steam insures the oil adhering to the flange and prevents spattering on the tread of the tire. Oil consumption is very low.

Full information will gladly be sent upon request. Write for Catalogue FO-81.

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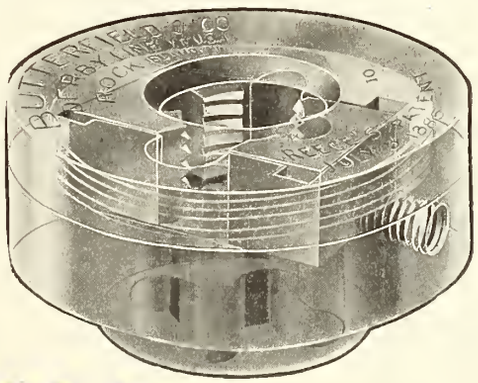

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Are adjustable, but

have all the advantages of a solid die without one of the disadvantages, and the adjustment is simplicity itself. Reece's Screw Plates are the only ones where dies are held in a collet that allows the reversing of the dies in the collet for use in a lathe or other machine. They are practically everlasting. We can cite cases where they have been in constant use for **thirty years** before new dies were necessary!

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The best way to educate your employes to the safety habit is by signs.

The "SAFETY FIRST" sign will be before them many times each day and warn them of the constant danger they are subject to in the course of their duties.

Enamelled iron signs, on account of the brilliancy of their colors, attract immediate attention. They never fade and are as good in ten years' time as the day they are put up.

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We will be pleased to quote you prices and submit sketches on request.

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That is why so many Canadian Bridge Builders prefer their Hoists to be of **BEATTY-MAKE.**

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STRENGTH AND WEARING QUALITIES

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All principal sizes Annealed and Unannealed.

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Is the reason why we make our Replacers out of the BEST STEEL PLATE instead of cast metal. The distance from caboose to head end of train is getting longer, and when a man carries a pair of our Replacers that distance he is not all used up, but ready to rerail his car or locomotive.

The pair this man is carrying is our Standard No. 1, made of 9-16 plate, weight 164 lbs. per pair, and guaranteed to carry 200 tons.

We make smaller sizes, No. 3 for Mine Work, Electric Motors, Mine Engines and Rope Haulage ; weight 58 lbs. per pair.

Do not fool yourself. If you want efficiency and quick service give your men a tool they can handle, that will do the work and that pleases them.

SEND FOR CIRCULAR SHOWING USERS.

70,000 PAIR IN SERVICE.

The Alexander Car Replacer Manufacturing Co.
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COMPLETE HYDRAULIC EQUIPMENT
FOR
RAILWAY AND SHIP BUILDING PLANTS

Wheel Presses, Keel Plate Bending Presses, Riveters, Shears, Presses, etc., etc.
Centrifugal Pumps, Pumping Engines, Gas Plants, Gas Power Plants, Cast Iron Pipe, Hydrants, Valves & Fittings, etc., etc.

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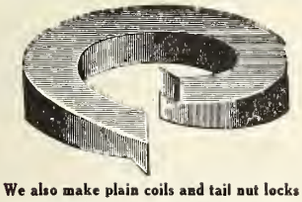
The Positive Lock Washer
is the BEST Nut LOCK for all purposes



We also make plain coils and tail nut locks
The Positive Lock Washer Co.
Sole Mfrs., Newark, N.J.
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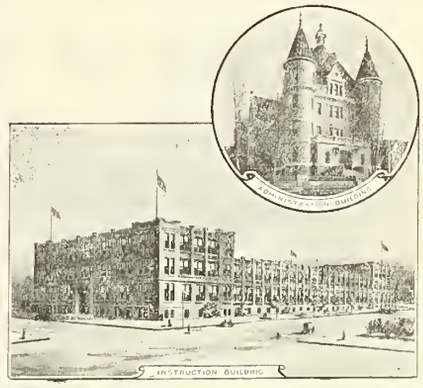

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This university does not reserve its advantages for the wealthy or well-to-do—its privileges are within the reach of all. It does not ask a man to give up his job and leave home—it comes to him wherever he may live.

This university has students among all classes of men in every civilized country on the globe. It can truly be called "The World's Greatest University"—it enrols a hundred thousand students every year—more than all the technical schools combined.

Two hundred and seventy-two courses are taught by this university—thirty of them are designed especially for men employed on the railroads and in ocean and lake navigation.

More than two hundred of the railroads in America have made co-operative agreements with this institution for the training of their employes.

This great Spare-Time University is the International Correspondence Schools with headquarters in Scranton, Pennsylvania, and London, Eng.

Full particulars will gladly be furnished upon request—either about individual courses for ambitious men who want to qualify for promotion or about the co-operative agreements for railroad officials who want to increase the efficiency of their employes.

Use the attached coupon for convenience in inquiring.

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Please explain, without obligation to me, how I can qualify for the position before which I mark X.

Locomotive Engineer	Marine Engineer
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Name .....
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Do you wish particulars about co-operative plan for railroads? .....

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Irrigation Pumps Municipal Pumps Deep Well Pumps

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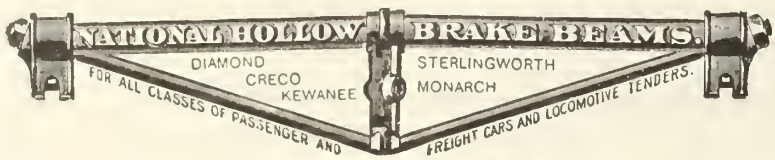

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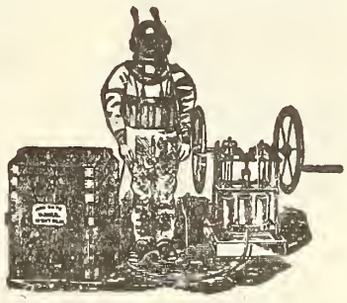

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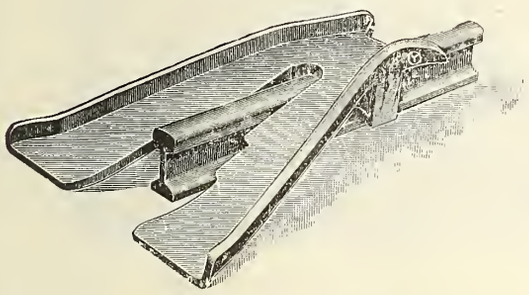

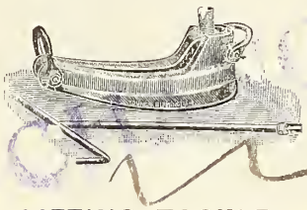

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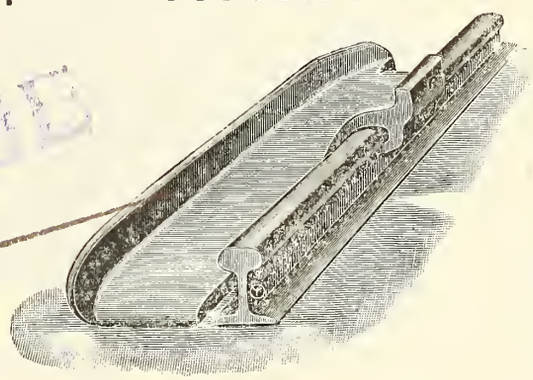

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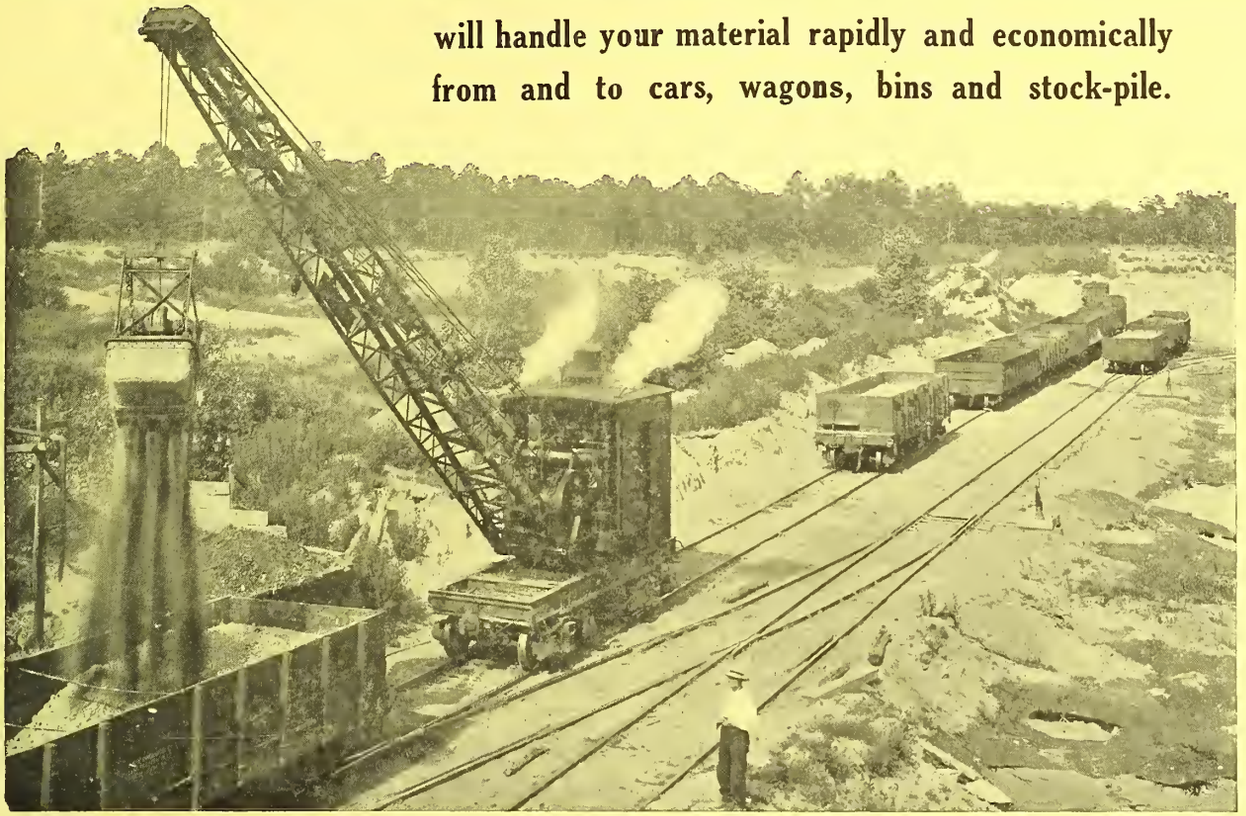

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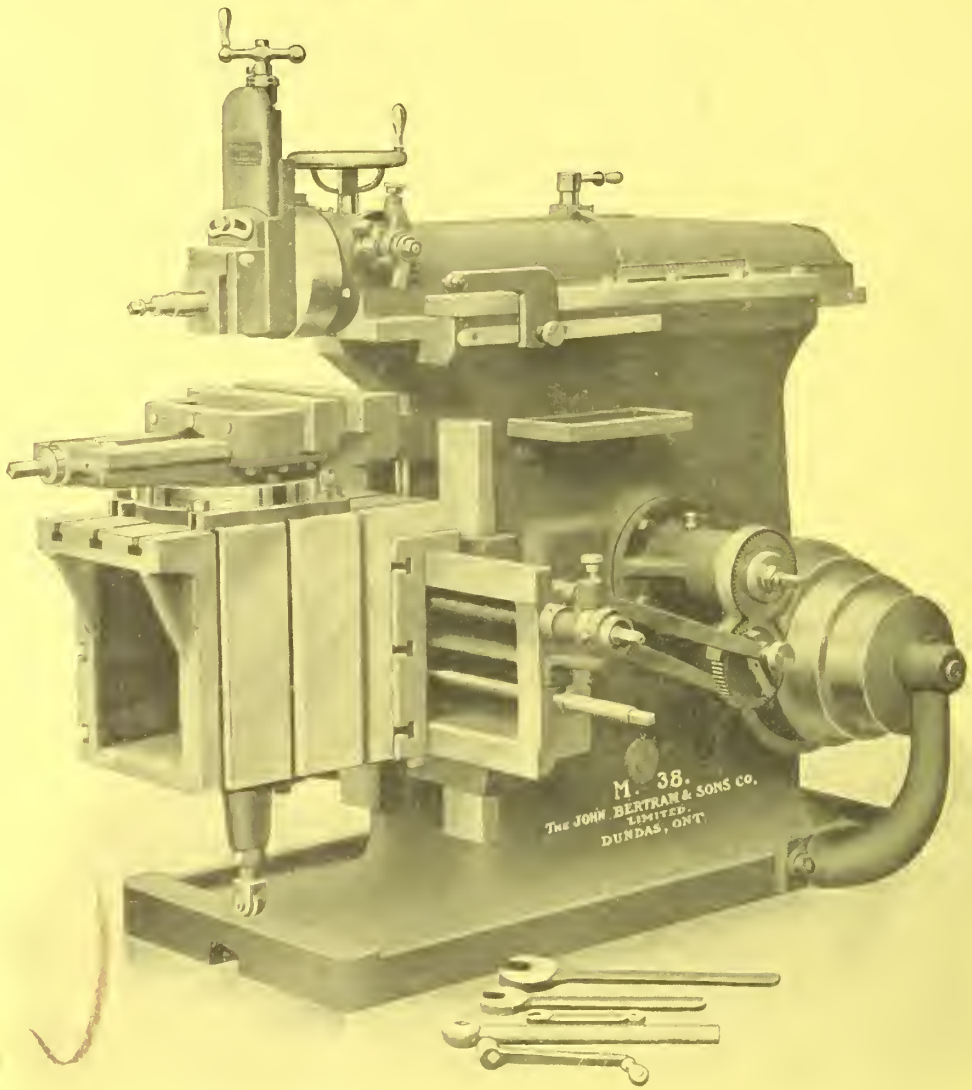

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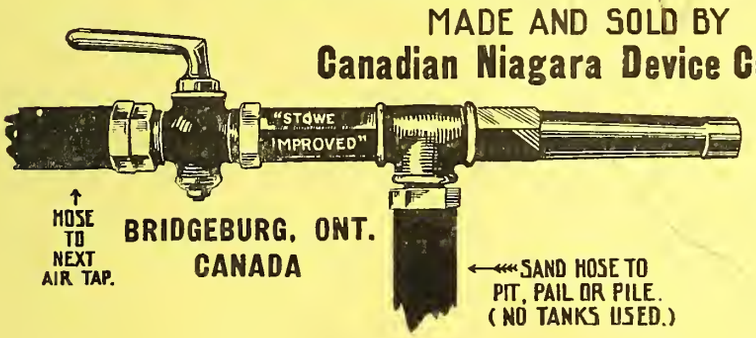

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Low Consumption of Free Air — **Light Weight** — **Extreme Portability**

Our list of users, located from COAST to COAST and ABROAD, comprises the following industries:

RAILROAD, STEEL, SHIP, IRON, BRIDGE, CAR, PIPE, BOILER, RUBBER, FOUNDRY, POWER, LOCOMOTIVE, AUTOMOBILE, MACHINE, ELECTRICAL, CHEMICAL, TEXTILE, PACKING, DISTILLING, CONTRACTOR, QUARRY, MINING, REFINERY AND GOVERNMENT PLANTS.

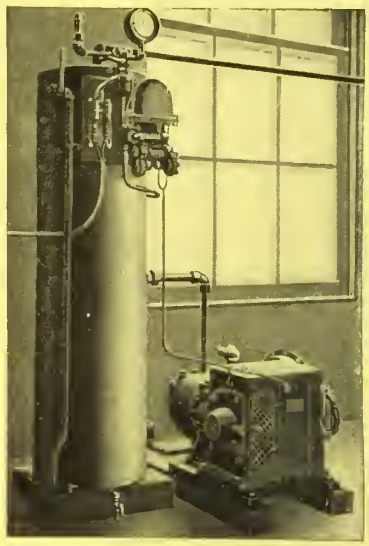
YOUR COMPETITOR may be using the NIAGARA PORTABLE SAND BLAST and PAINTING DEVICES. CAN YOU AFFORD TO BE WITHOUT ONE OR MORE OF THESE DEVICES, the most valuable adjuncts to any tool-kit?

Index to Advertisers, Page 92 — Purchasing Agents' Guide, Page 87

Westinghouse
Motor-and Belt-Driven
Air Compressors

Westinghouse Belt-Driven Compressor.

The illustrations show the compactness of these units, but their efficient and reliable operation can only be fully realized in service.

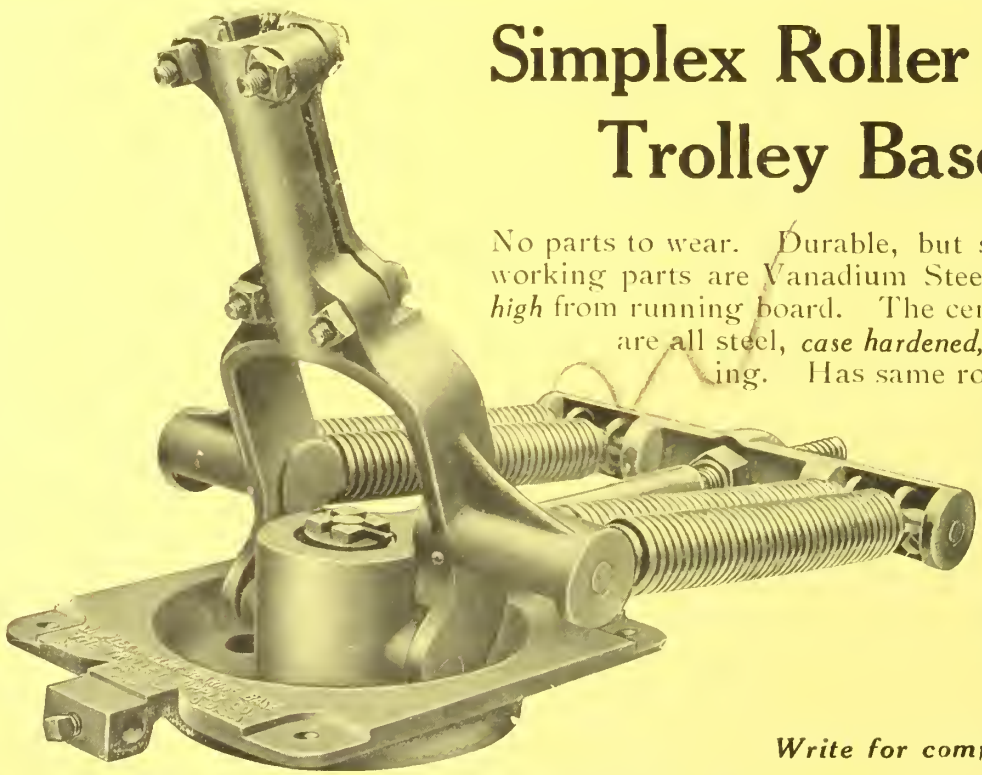


A Westinghouse Motor-Driven Compressor Installation.

The only difference between the motor and belt-driven units is the substitution of a belt-wheel for the motor. Both types may be controlled by an automatic governor.

Canadian Westinghouse Company, Limited, Hamilton, Ontario

TORONTO Traders Bank Bldg. MONTREAL 52 Victoria Square OTTAWA Ahearn & Soper, Ltd. HALIFAX Telephone Bldg. FT. WILLIAM Telfer Bldg. WINNIPEG 158 Portage Ave. East CALGARY Grain Exchange Bldg. EDMONTON Dominion Bldg. VANCOUVER Bank of Ottawa Bldg.



Simplex Roller Bearing Trolley Base

FOR ALL KINDS OF SERVICE

No parts to wear. Durable, but simple in construction. All working parts are Vanadium Steel. A low base, *three inches high* from running board. The centre pin, rollers and bushing are all steel, *case hardened,* which prolongs life of bearing. Has same roller bearing as our Peerless No. 10 Roller Bearing Base, eight rolls, $\frac{7}{8}$-inch diameter.

THE OPPOSITE OF OTHER BASES

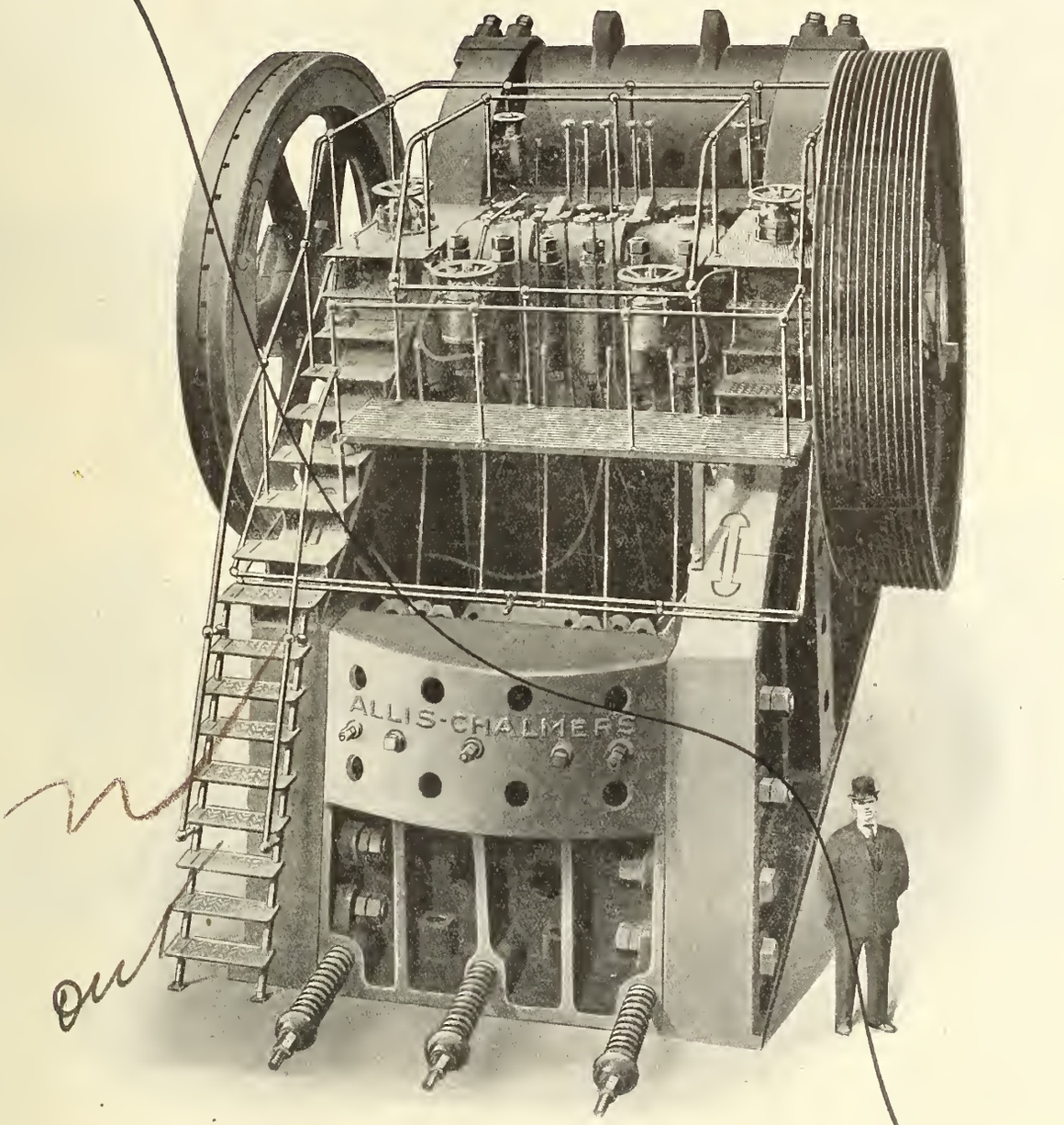
LOWEST TENSION — when the pole is hooked to roof of car.

INCREASED TENSION —as the pole goes up.

Write for complete information.

THE TROLLEY SUPPLY CO. - Canton, Ohio

ROCK CRUSHERS OF ALL CAPACITIES



REAR VIEW OF JAW CRUSHER

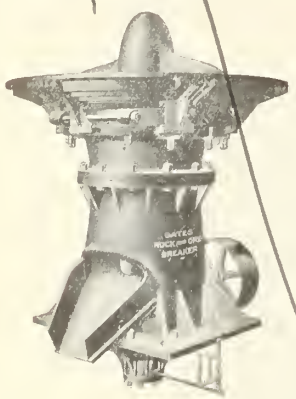
Recently built for a stone company.

Overall Dimensions of this Crusher—length 29 ft. 9¾ in., breadth 16 ft. 5 13-16 in., height 17 ft 3 in. Approximate weight 510,000 lbs. Receiving opening 66 in. by 84 in. Product about 300 tons per hour with 4⅞ in. opening between jaws, increased 20 per cent. by opening machine to 6 in. Horse power 200 to 250.

Canadian Allis-Chalmers, Limited

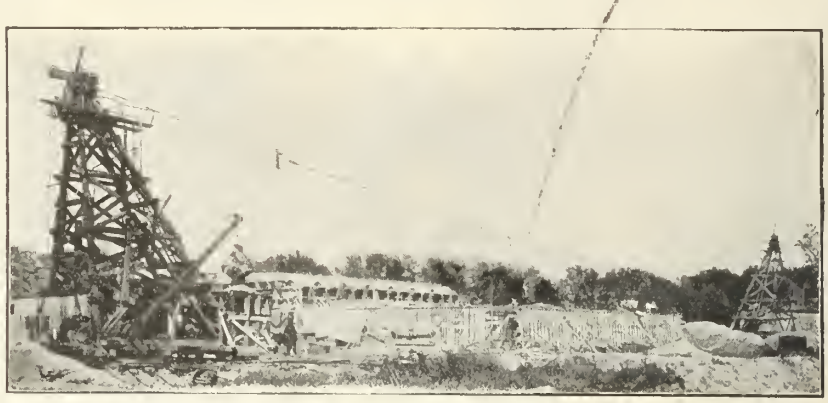
HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

CONTRACTOR'S PLANT



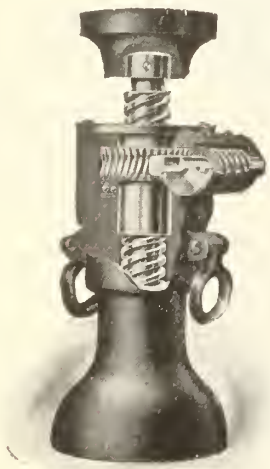
Gates' Rock Breakers

See Bulletin 1441 on large Gates' Breakers used with steam shovels.



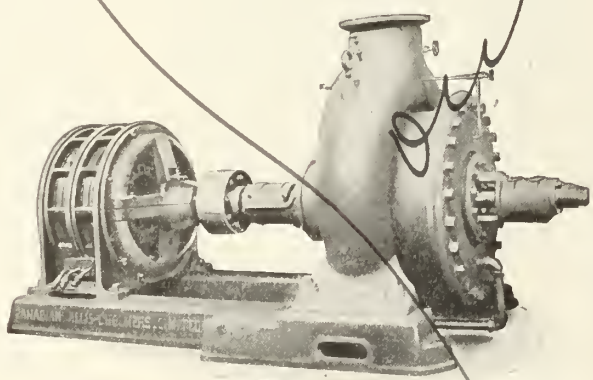
Lidgerwood Cableways

For use in general contracting work. Also Lidgerwood Hoists, Rapid Ballast Unloaders and Derricks.



Atlas Jack

The McKiernan-Terry Atlas Jack can be elevated to one-thousandth part of an inch, and has been highly commended by contractors having delicate shoring operations to do.



Pumps

Turbine or Reciprocating.

McKiernan-Terry Drills

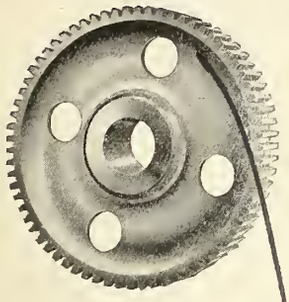
Work in wet or dry rock at a minimum expense.

Use "F. J. A. B." Drill Steel.

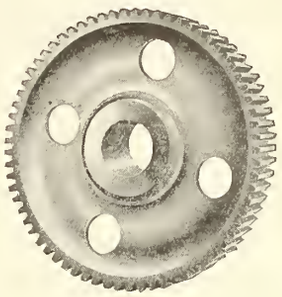
CANADIAN ALLIS-CHALMERS, LIMITED

Manufacturers of Air Compressors, Avery Scales, Boilers, Cement Making Machinery, Concrete Mixers, Flour Mill Machinery, Gas Engines, Hoisting Engines, Hydraulic Machinery, Lidgerwood Engines and Cableways, Locomotives, Logging Machinery, Mining and Crushing Machinery, Ornamental Metal Work, Rock Crushers, Rock Drills, Saw Mill Machinery, Steam Pumps, Steam Shovels, Steam Specialties, Steam Turbines, Structural Steel, Transmission Machinery, Turbine Pumps, Water Pipe, Water Wheels.

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.



Care in Manufacture Insures High Quality



Grade M Gears and Pinions are made **right.** A close observation of the sixteen processes through which each gear and pinion must pass will convince anyone that this gearing is as fine a product as modern machine shop practice is capable of delivering. The journal finish on the ends of gear hubs, the smooth bore, the entire absence of scale on the teeth, the system of inspection and, finally, the test for smooth running qualities must be admitted as superior points in the manufacture of

Grade M Gears and Pinions

All blanks are made to specification and grade. Every tenth blank is drilled and the drillings sent to the laboratory for analysis. Only if the chemical contents are fully up to specification is the stock released for factory use. Thus superior material is added to superior workmanship to make Grade M Gearing of the highest possible quality.

Over 15,000 railway motors are now equipped with these gears. Ten of the largest electric railway systems in the United States and Canada have adopted the Grade M as standard.

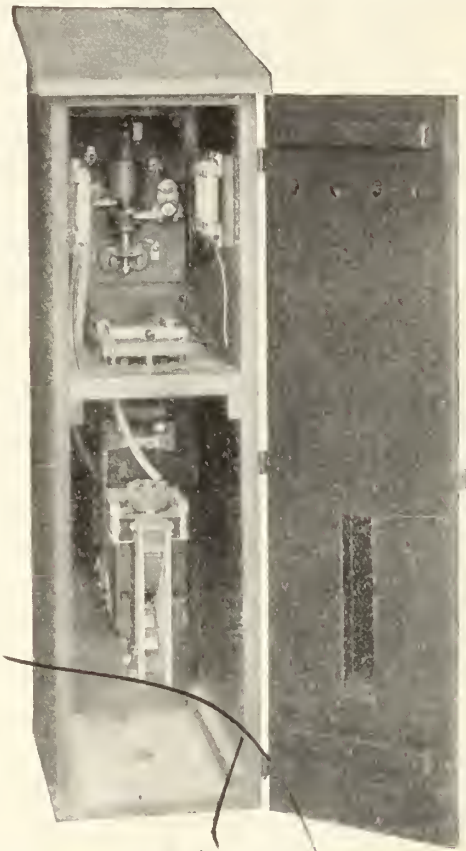
Send for Bulletin A-4199—It gives details.

CANADIAN GENERAL ELECTRIC COMPANY, LIMITED

Manufacturers of Electrical Apparatus and Supplies for Railway, Light and Power Purposes

HEAD OFFICE: TORONTO. District Sales Offices: Montreal, Halifax, Ottawa, Cobalt, Porcupine, Fort William, Winnipeg, Regina, Saskatoon, Calgary, Edmonton, Nelson, Vancouver, Victoria, Prince Rupert.

A NEW SECTIONALIZING SWITCH



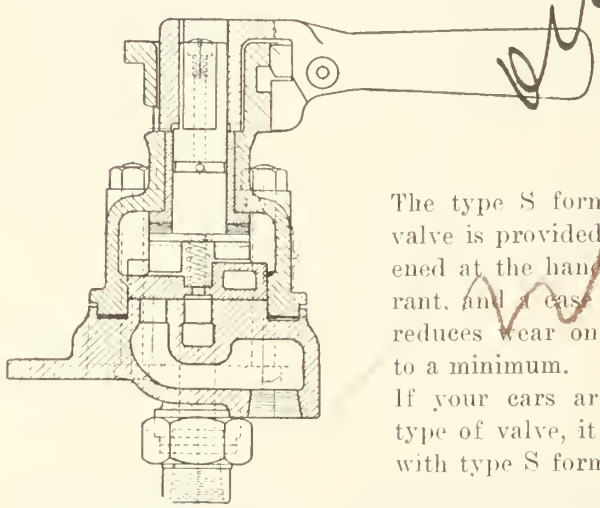
The new C-G-E Type SW-65-A Sectionalizing Switch has a continuous capacity of 800 amperes and is adjustable for overloads of 600 to 1200 amperes. A new overload trip and automatic reset feature greatly increases the efficiency of the device.

The new switch is mounted in a long, narrow box conforming to the trolley pole on which it is to be installed, giving a much more sightly effect than the old style box.

With this switch, an overload or short circuit on the line throws out only the station breaker feeding the section affected, thus avoiding interruption of service on the other sections. When the trouble is remedied and the station breaker again thrown in, the switches on the line automatically close, once more desectionalizing the system.

All the advantages of a sectionalized system without its disadvantages are made possible by the new C-G-E Automatic Sectionalizing Switch.

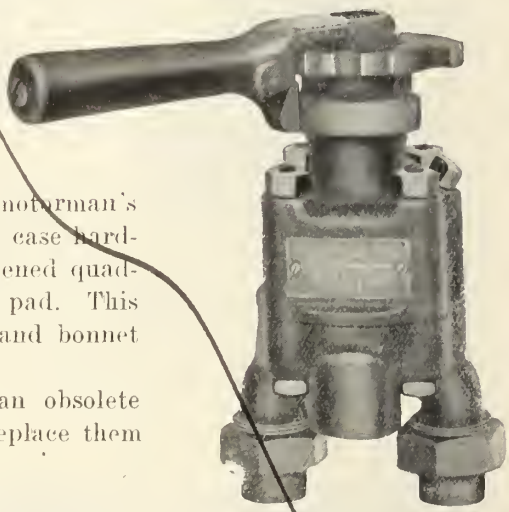
A NEW MOTORMAN'S AIR BRAKE VALVE



Cross Section of Type S Form J Air Brake Valve.

The type S form J light weight motorman's valve is provided with a steel stem, case hardened at the handle fit; a case hardened quadrant, and a case hardened wearing pad. This reduces wear on the stem handle and bonnet to a minimum.

If your cars are equipped with an obsolete type of valve, it will pay you to replace them with type S form J valves.



Type S. Form J Air Brake Valve.

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CANADIAN GOVERNMENT RYS.

Intercolonial Railway
Prince Edward Island Railway

Two Trains from Montreal

Ocean Limited	Maritime Express
7.30 p.m. Daily	8.40 a.m. Daily except Saturday

VIA THE

ONLY ALL CANADIAN ROUTE

TO

Canada's Winter Ports

Halifax, N.S.	St. John, N.B.

☞ **Where Canada's next Contingent will embark.** ☜

Manufacturing Methods Plus Right Material Make the Dependable Battery

Any two dissimilar metals when immersed in electrolytic solution will, upon completion of external connections, produce a current of electricity. The proposition is to find the metals and electrolyte that will give the best results.

A good idea of the efficiency of

The Edison Primary Cell

can be obtained by computing its power for doing work. Each cell is capable of developing sufficient energy which, if converted into mechanical power in a perfect electric motor, would raise a pound weight 732,891 ft. in as many seconds, or one ton 366 ft.

Edison RSA Cell. Type 404.

This remarkable power for work is due to the development of a cell of correct design and containing proper proportions of such materials as are best adapted to develop electrical energy. Whether manufacturing methods insure uniformly high efficiency is, however, the question of greatest interest to the consumer.

The system under which Edison cells and renewals are manufactured guarantees a uniform product of the first quality. This system provides for thorough inspection of raw material and finished product; of tests, not only of the finished cell, but of individual vital parts (during the process of manufacture) which, if not perfect, would impair the efficiency of the complete unit. While inspection of this kind is expensive, there is no question of its value, for it has developed in the mind of battery users a feeling of security, owing to the absolute dependability of Edison material.

TRADE MARK
Thomas A Edison

Thomas A. Edison, Inc., 262 Lakeside Ave., Orange, N.J., U.S.A.

28 "Service" Branches Throughout Canada

CANADIAN CONSOLIDATED RUBBER CO., LIMITED
MONTREAL, P. Q.

"BUSINESS AS USUAL"

We have not, owing to the War, shut down any of our plants, discharged any of our workmen, reduced their hours of labor, or cut their rates of pay.

We are doing "BUSINESS AS USUAL."

We intend to continue this policy to the extent of our ability, and, to that end, suggest that you confine your purchases, during the war and thereafter, as largely as possible to goods "MADE IN CANADA."

When in the market for Rubber goods of any description—Belting, Hose, Packing, Tires or anything else—Write or wire our nearest Branch for prices and information.

It is our desire to serve you.

"BUSINESS AS USUAL"

CANADIAN CONSOLIDATED RUBBER CO., LIMITED
MONTREAL, P. Q.

28 "Service" Branches Throughout Canada

GALENA OILS

HAVE NO EQUAL IN

QUALITY, EFFICIENCY AND ECONOMY

SOLE MANUFACTURERS OF

Celebrated Galena Coach, Engine and Car Oils

LUBRICATION ON A GUARANTEED BASIS

ELECTRIC RAILWAY LUBRICATION A SPECIALTY

KEEP STANDING LAST ADVERTISEMENT.

Perfection Valve and Signal Oils

Galena Railway Safety Oil—Made especially for use in headlights, marker and classification lamps.

Galena Long Time Burner Oil—For use in switch and semaphore lamps, and all lamps for long time burning, avoiding smoked and cracked chimneys and crusted wicks.

TESTS AND CORRESPONDENCE SOLICITED

Galena Signal Oil Company

WORKS

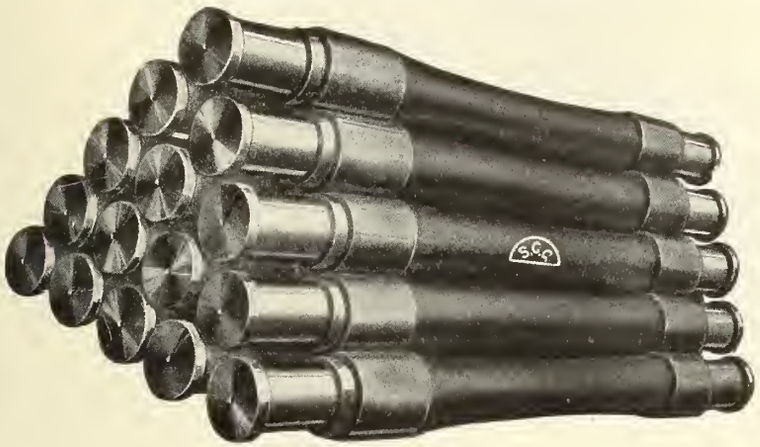
Franklin, Pa., and Toronto, Ont.

Canadian Sales Office — 603 Shaughnessy Bldg., Montreal, Que.

The Steel Company of Canada, Limited

HAMILTON, ONT.

Forged Steel Axles



We are prepared to furnish all kinds of forged steel axles for cars, freight, passenger and electric, and for locomotives, including drivers, engine trucks or tender trucks.

We Carry a good Stock of

Railway Track Equipment

including

Track Bolts **Track Spikes** **Tie Plates** **Angle Bars**

Pole Line Hardware

Wire, Wire Nails, Staples, Screws, Rivets, Putty
"Tiger Brand" White Lead. "Invincible" Fencing.

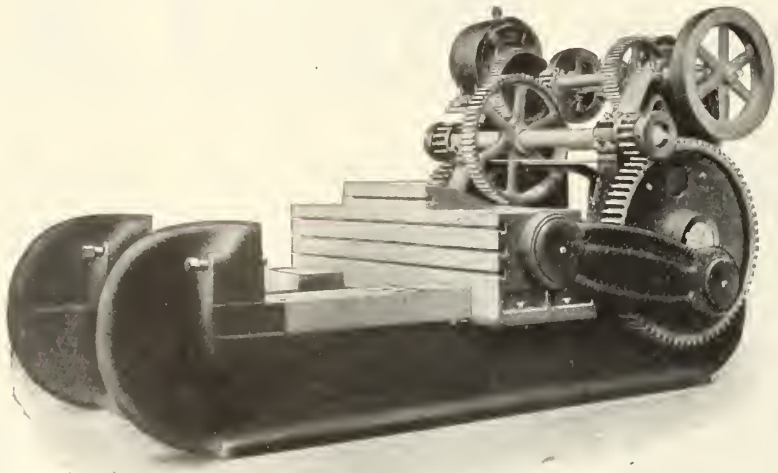
Sales Offices:

HAMILTON **MONTREAL** **TORONTO** **WINNIPEG**
VICTORIA, B.C. **VANCOUVER, B.C.** **ST. JOHN, N.B.** **HALIFAX, N.S.**

The Bulldozer Line

MANUFACTURED BY

WILLIAMS, WHITE & CO., MOLINE, ILL.



No. 9 BULLDOZER, MOTOR DRIVEN

The BULLDOZER is a wide, roomy, long-stroke, powerful press, having ample die space for large forms. It is primarily intended for hot bending and shaping, but is also well suited for hot punching. To a less degree it is used for cold punching, bending and straightening, and much light work is produced cold on the machine.

Send us a blue print showing the work required and we shall be pleased to specify the machine best suited for the job.

Built in following sizes:

	0	1	21	2	22	3	23	4	24	5	25	6	26	7	27	8	28	9
Length over all	7′ 6″	7′ 6″	7′ 6″	8′ 6″	8′ 6″	9′ 3″	9′ 3″	10′ 8″	11′ 0″	11′ 8″	11′ 10″	12′ 10″	13′ 1″	15′ 5″	15′ 5″	15′ 8″	17′ 3″	18′ 0″
Width over all	2′ 6″	3′	3′ 1″	3′ 7″	3′ 7″	4′	4′	4′ 7″	4′ 7″	6′ 3″	6′ 3″	6′ 3″	6′ 3″	6′ 11″	6′ 11″	7′ 4″	7′ 4″	8′ 10″
Face of crosshead	18″ x 5″	20½″ x 5″	20½″ x 5″	34½″ x 6½″	34½″ x 6½″	39″ x 7″	39″ x 7″	45″ x 7½″	45″ x 8½″	64″ x 12″	63″ x 12″	63″ x 12″	63″ x 12″	70″ x 16″	70″ x 16″	72″ x 16″	72″ x 16″	89½″ x 20″
Movement of crosshead	8″	14″	14″	16″	16″	16″	16″	18″	18″	20″	20″	20″	20″	22″	22″	24″	24″	24″
Space for Dies, with crosshead forward	24″	24″	24″	30″	30″	30″	30″	38″	38″	38″	38″	42″	42″	48″	48″	48″	48″	49″

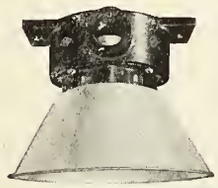
Canadian Sales Agents:

MUSSENS LIMITED

MONTREAL 318 St. James St.	**TORONTO** 155 West Richmond St.	**COBALT** Opp. Right of Way Mine	**WINNIPEG** 259-261 Stanley St.
CALGARY 10th Ave. and 3rd St. East	**VANCOUVER** 101 Water St.	**QUEBEC** 142 Peter St.	**HALIFAX** 78 Granville St

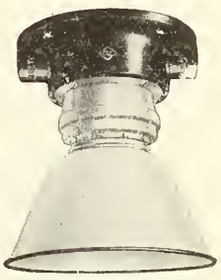
Condulets For Car Lamp Outlets

A Few of the Many Types and Possible Arrangements

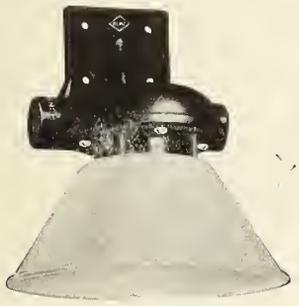


Type BO
Arranged for Ceiling

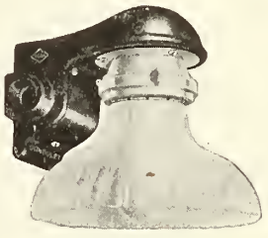
Type DBC
for
Postal Car
Ceiling



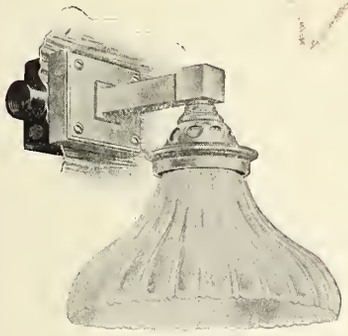
Type CLC
Arranged for Ceiling



Type BLMC
Arranged for Deck Sill

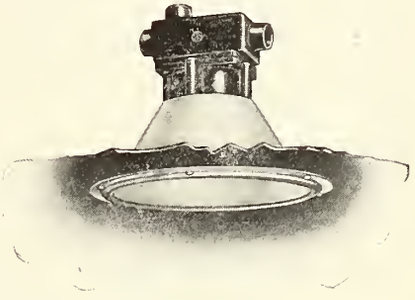


Type DSOA
Arranged for Deck Sill



Type KRR
Arranged for Side Wall

Two-Hundred Page Condulet Catalog and Supplementary Bulletins Sent to Any Address, Free Upon Request.



Type JRYA
Arranged for Vestibule Ceiling

Order From Your Jobber. If He Does Not Stock Them, Write Us.

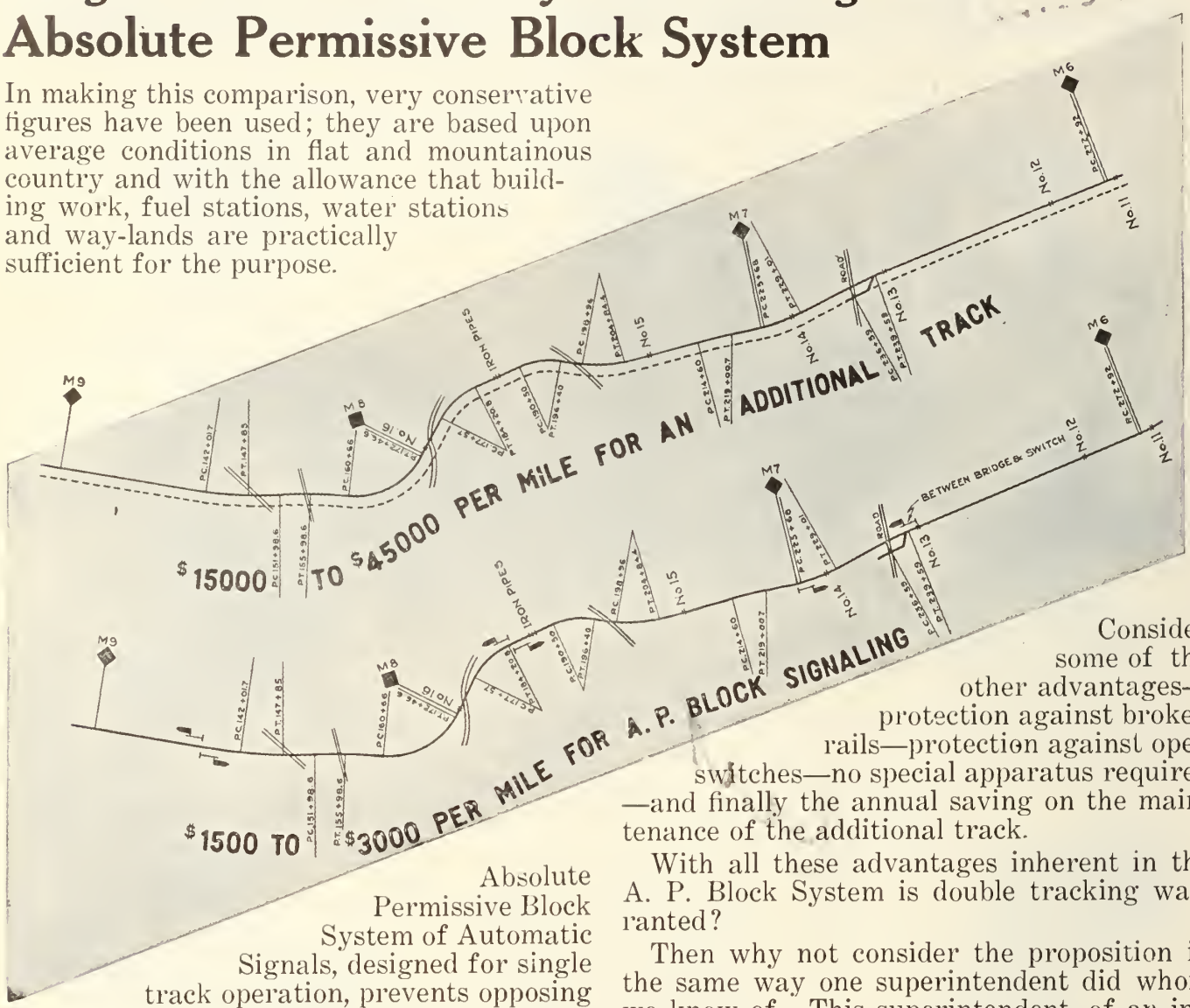
Crouse-Hinds Company of Canada, Ltd.

Main Office and Works:

Toronto, Ontario, Canada

Save 9/10 the cost of double-tracking your single-track line by installing the Absolute Permissive Block System

In making this comparison, very conservative figures have been used; they are based upon average conditions in flat and mountainous country and with the allowance that building work, fuel stations, water stations and way-lands are practically sufficient for the purpose.



Absolute Permissive Block System of Automatic Signals, designed for single track operation, prevents opposing trains from entering the same piece of single track between sidings but permitting trains, moving in a like direction, to as closely follow each other at speed and with entire safety as though they were on one track of a double track line.

This facilitation of traffic which the A. P. B. System gives, approaches the results from double track operation and is secured at about 1-10 the cost of an additional track.

Consider some of the other advantages—protection against broken rails—protection against open switches—no special apparatus required—and finally the annual saving on the maintenance of the additional track.

With all these advantages inherent in the A. P. Block System is double tracking warranted?

Then why not consider the proposition in the same way one superintendent did whom we know of. This superintendent, of an important railway, recommended to his management an appropriation of a large sum of money for a second track. After careful investigation it was found that the expense of the second track could be avoided by an installation of our A.P. Block System; this authority was granted, the system has been installed and it has postponed double tracking that particular line for many years to come.

You can make the some postponement.

"Safety First"

GENERAL RAILWAY SIGNAL COMPANY

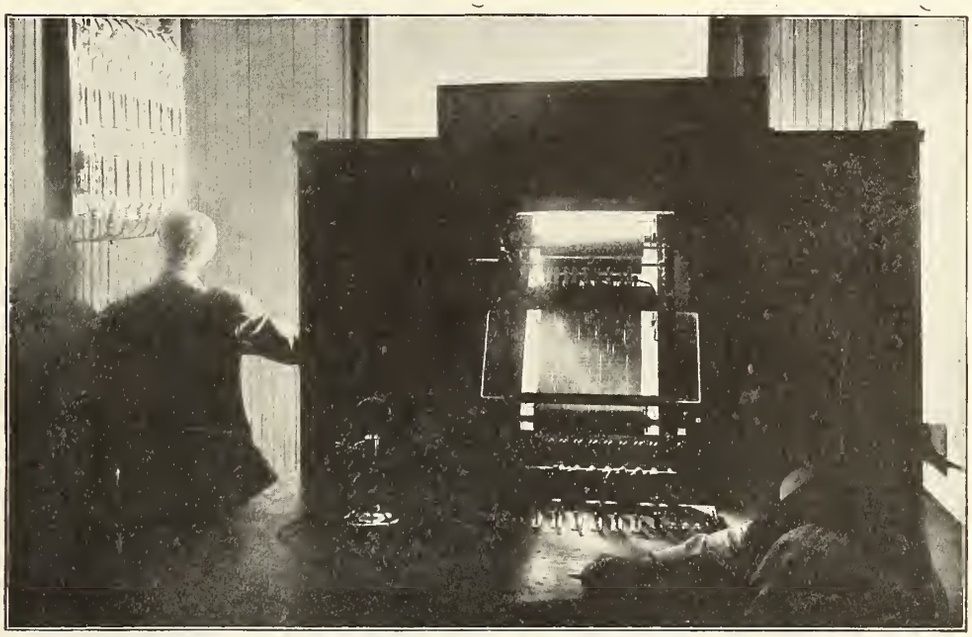
OF CANADA LIMITED

Office and Works, Lachine, Quebec

Branch Office, Winnipeg, Manitoba

9137

What Do You Really *Know* About The Simmen System of Signaling



Did you ever talk about it to any responsible official of any of the high-speed interurban roads using the Simmen System?

Did you ever ride on a car protected by this System? And see the cab signal constantly staring the motorman in the face—see it change from green to red and back to green again?

Have you ever sat at a Simmen Dispatcher's Table and watched the automatic recording of the movements of every train? Seen the dispatcher stop a train at a given point by simply pushing a lever?

Have you ever examined the interlocking feature on the dispatcher's levers which prevents him from giving clear signals to opposing trains?

Have you ever had definite authoritative figures on the cost of installation and operation of the Simmen System?

How can you judge of the value of the Simmen System without thoroughly investigating its workings and cost?

You can make such an investigation easily and conveniently. Do it.

THE NORTHEY-SIMMEN SIGNAL CO., Ltd.

Buffalo, N.Y. **Indianapolis, Ind.** **Toronto, Canada**

To Parties Manufacturing, or Intending to Manufacture in Canada:

We are prepared to produce, upon a large scale, articles of metal and wood.

Our facilities are those necessary for the extensive and economical manufacture of the heaviest freight cars and the highest class of passenger cars. These facilities include plants for the manufacture of steel, malleable and grey iron castings—rolled steel and iron products—frogs, switches and track work for electric and steam railways—coil and elliptic springs—forgings—cabinet and other wood work—and all preparatory and finishing adjuncts.

The various plants are distributed from Amherst, N.S. to Fort William, Ont.

Correspondence invited.

Please address Sales Department,
P. O. Box 180,
Montreal.

Canadian Car & Foundry Company, Limited
Canadian Steel Foundries, Limited
Pratt & Letchworth Company, Limited
Rhodes, Curry Company, Limited

HIGH GRADE ELECTRIC

STEEL CASTINGS

MANGANESE STEEL

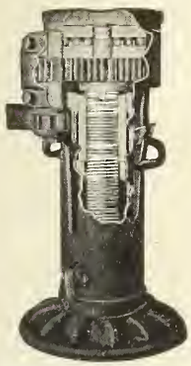
FOR CRUSHER JAWS AND HEAVY WEAR PARTS

BRONZE

M.C.B. STANDARD JOURNAL BEARINGS & ENGINE BEARINGS

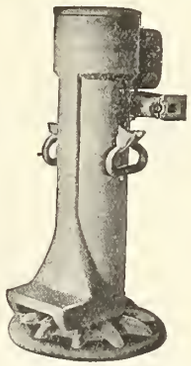
CELEBRATED "H & E" LIFTING JACKS

Our Patent Ball-bearing Geared Jacks are ideal in Railroad and heavy Construction work.



Showing the construction of our geared jacks.

25 - ton Roundhouse Jack, 19 in. high, rise 8½ in., weight 135 lbs.



35-ton Bridge and Wrecking Jack, 24 in. high, rise 13 in., diameter of base 12 in., weight 170 lbs.

These Jacks are built for heavy service in bridge, roundhouse and wrecking work, are made with great care from the very best material and will be found the most satisfactory jacks for the purpose on the market.

IMPROVED REINFORCED STEEL-BACKED

BRAKESHOES

LOCOMOTIVE DRIVER and TRUCK SHOES. FREIGHT and PASSENGER CAR and ELECTRIC CAR SHOES.

Canadian Brakeshoe Company, Limited

Sherbrooke, Que.

Sole Agents for Brakeshoes for Canada outside of British Columbia, Messrs. Taylor & Arnold, Limited, Montreal and Winnipeg. Sole Agents for British Columbia, The B.C. Equipment Co., Vancouver, B.C.

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and

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Branches:
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SPECIALTIES:

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Locomotive Throttle Packing.
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"THE ANCHOR HOLDS"

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Cylinder and Valve Bushes.
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Rome Superior Staybolt Iron
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"WE SELL RESULTS"

Why not make it Unanimous?

Below is a list of the electric railways in Canada using—

Electric Weld Rail Bonds

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Niagara, St. Catharines & Toronto Railway Co., St. Catharines, Ont.
Ottawa Electric Railway Co., Ottawa, Ont.
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LAST

Electric Weld Bonds do not corrode at the terminals and are made to fit any condition.

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The Electric Railway Improvement Co.

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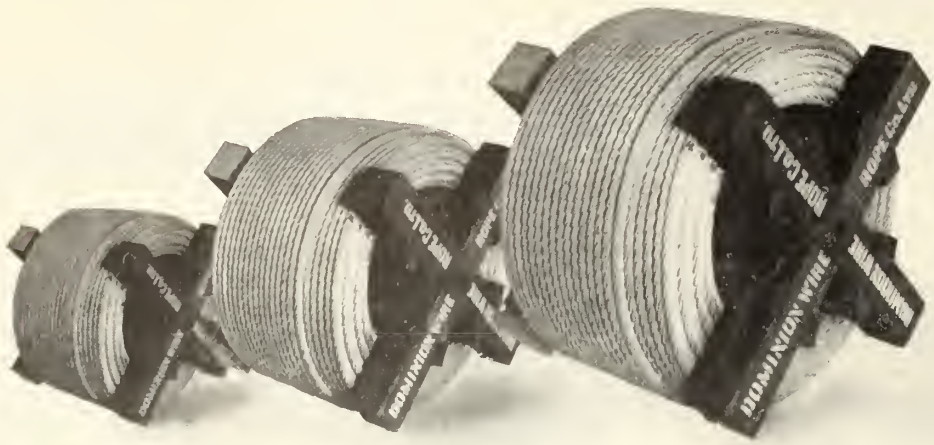
WIRE ROPE



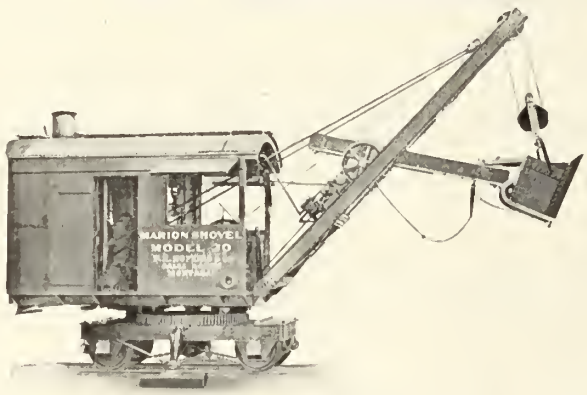
WIRE ROPE

MANUFACTURED BY

THE DOMINION WIRE ROPE CO., LTD., MONTREAL

"Marion"

Steam Shovels



We supply "Marion" Shovels for all classes of work—to Railroads —Mines Contractors. All sizes—All styles.

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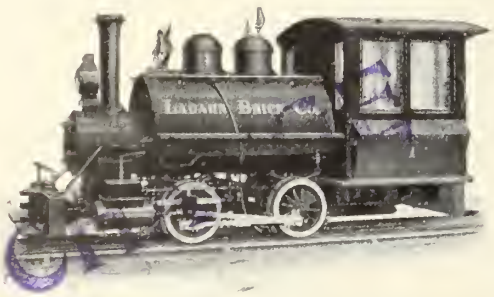

We furnish Locomotives in all sizes for any gauge track. Prompt shipment of all styles.

"Kilbourne & Jacobs"

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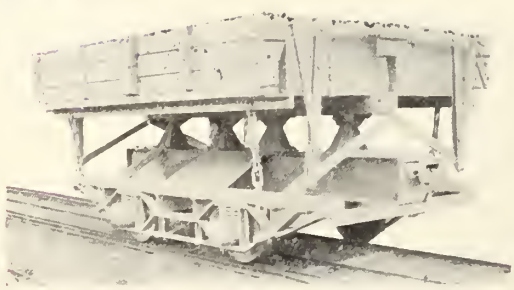

The best steam shovel car to be obtained—all sizes—for all gauges of track.

Prompt shipment

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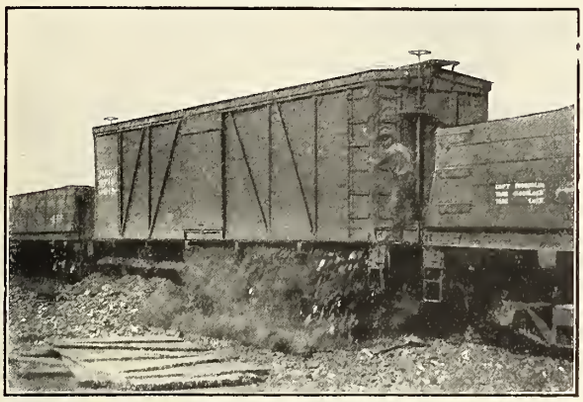
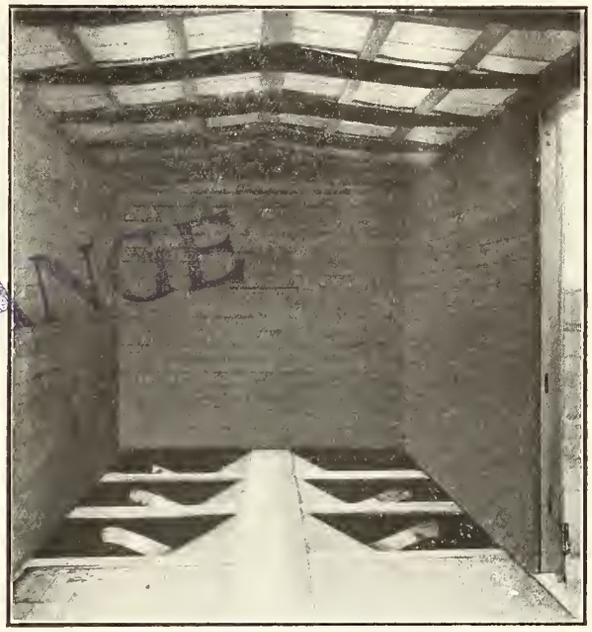
Why Not Dump Coal Out of Box Cars?

— OTIS DUMP CARS —
PATENTED



DUMPING 40 TONS OF COAL
AND IMMEDIATELY RETURNED TO SERVICE.

A Practical Level Floor Dumping Box Car For GRAIN COAL SAND CEMENT and General Merchandise



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WHY NOT INCREASE THE EFFICIENCY OF YOUR BOX AND STOCK CARS BY MAKING A DUMPING COAL CAR OUT OF THEM. TO SAVE TIME AND LABOR DURING THE COAL HANDLING SEASON.

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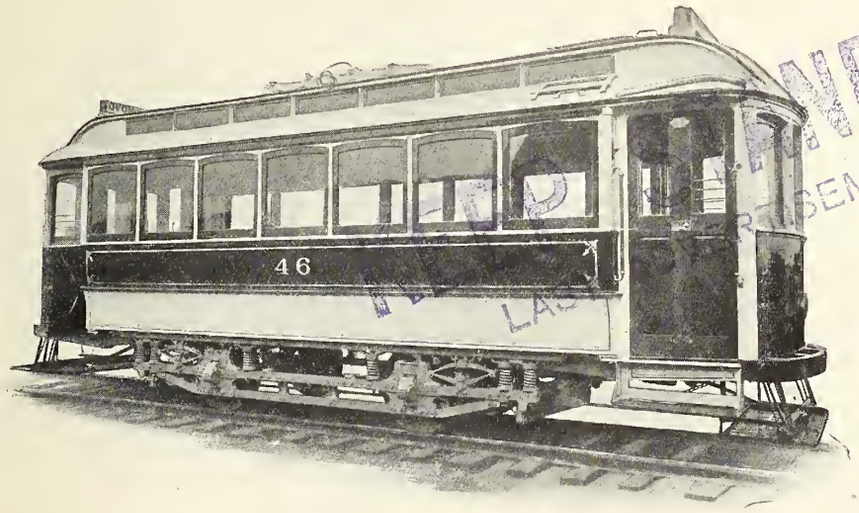
THE HART-OTIS CAR CO., LIMITED : MONTREAL

Nova Scotia Car Works
LIMITED



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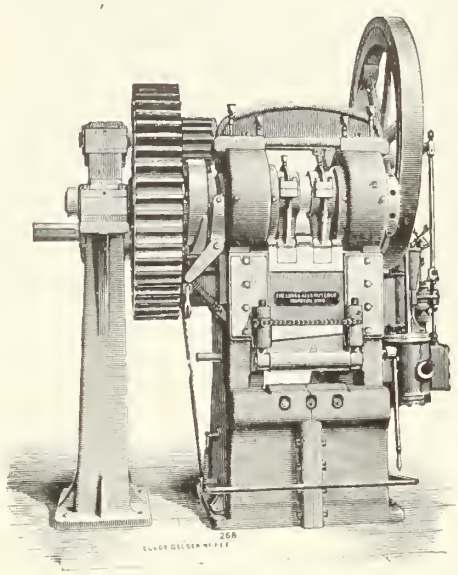

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THE LONG & ALLSTATTER CO.

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Riveting Machines **Tire Welding Machines**

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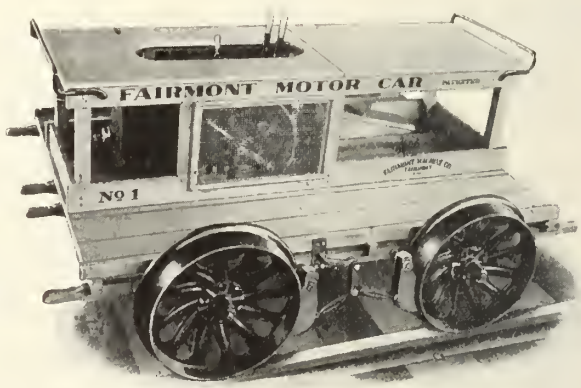
Write for Catalogue if interested. Correspondence invited.

THE

FAIRMONT

SECTION MOTOR CAR



is the kind the Foreman would choose after trying all makes.

It is light, starts without pushing, runs either way without turning, reverses without stopping car or cranking, and is easy to start in the coldest zero weather.

It will pull a push car piled high with ties, and all the men in the gang with their tools. It will run upwards of 30 miles per hour if desired.

Thousands of foremen throughout North America have made motor cars from their old handcars by equipping them with this same engine, which we sell on very easy payments. The low price and easy terms on this car will surprise you.

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To the Land of Sunshine and Summer Days

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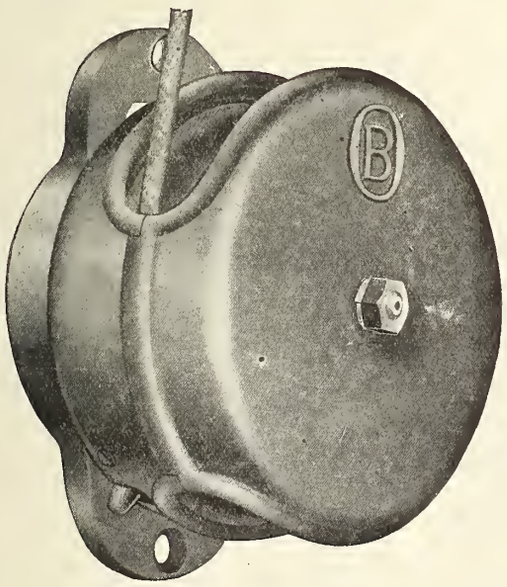
Those contemplating a trip of any nature should consult Canadian Pacific Ticket Agent, who will be pleased to quote rates, arrange reservations and attend to all details in connection with your trip ; or write

M. G. MURPHY **District Passenger Agent** **TORONTO**

O-B Trolley Catcher



Eliminates Uncertainty

When wheel leaves wire, trolley is caught after very short travel and held firmly. There is no "stepping up" or "climbing" of the pole.

The operating mechanism is simple in construction yet positive in operation.

All parts are made rugged to withstand severe use.

Let us send sample for free service demonstration.

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DEARBORN WATER TREATMENT METHODS COMPRISE

Knowledge of the Water Conditions
Application of the CORRECT REACENTS

Careful Supervision as to Quantity and Regularity of Treatment

Such thorough, scientific handling of bad water propositions alone insures constant and uniform results in the prevention of scale, corrosion, pitting and foaming.

The manner of applying Dearborn Treatment is simple, and calls for no outlay of capital for equipment. We require gallon samples of the waters for analysis. After completing the analyses we are ready to prepare treatment and will send an expert engineer to instruct in the proper handling of the material.

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MODERN HIGH-CLASS

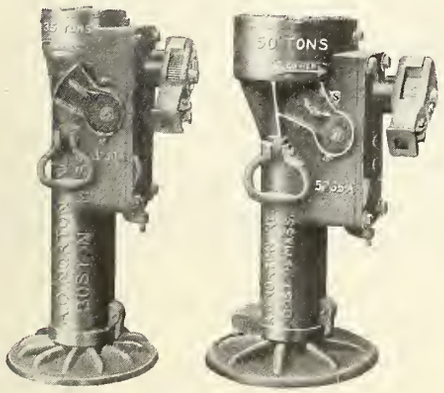
ROLLING STOCK

Passenger, Freight and Electric Railway, Car Castings, Forgings and Repair Parts.

CROSSEN CAR COMPANY, LTD.

COBOURG - ONTARIO

NORTON SELF LOWERING JACKS ARE THE FASTEST JACKS MADE



No matter what ANYONE says.
You can prove it by trying them beside any other make.

When load is raised, *your work is done.*

You do not have to crank or pump the load down as with other Jacks. Just "press the button" and the Jack lowers its full load with *absolute safety.*

Send for complete Catalogue and Discount. 35 and 50 Tons Capacity. Plain and foot lift.

Made in Canada by

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Manufacturers of

MARINE, RAILWAY AND GENERAL ENGINEERING FORGINGS OF ALL SHAPES AND UP TO 40 TONS IN WEIGHT, MADE FROM BEST ORDINARY OR HARMET FLUID COMPRESSED OPEN-HEARTH STEEL. OUR FORGE IS EQUIPPED WITH THE MOST MODERN STEAM HYDRAULIC PRESSES.

RAILWAY TRACK MATERIAL, fish plate, tie plate, track bolts, spikes, tee rails—12 to 40 lbs. per yard.

ROLLED STEEL FOR CAR BUILDERS' USE: Spring, machinery, tire, angle, and merchant bar steel, bright compressed shafting, rivets, tank plate—12-gauge up to 1" and 50" wide cold twisted steel bars for reinforced concrete work.

ALSO MINERS AND SHIPPERS OF THE CELEBRATED "OLD SYDNEY" COAL.
HIGH CALIFORIC VALUE--LOW ASH--UNEXCELLED FOR STEAM-RAISING PURPOSES.
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EXCELLENCE COUNTS!

Excellence in Railway Service

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The Grand Trunk System reaches all trade centres in Eastern Canada, and is now a large factor in Western Canada traffic through the Grand Trunk Pacific Ry., recently completed to the Pacific coast.

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Accommodation, 350 rooms. Rates $2.00 per day and upwards, European Plan.

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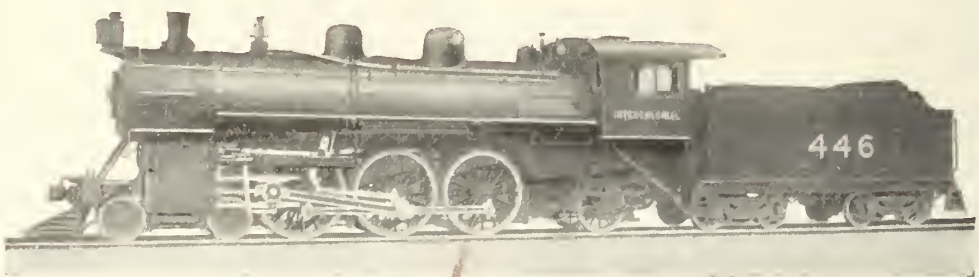
Heavier Trains—Less Coal and Water Per Trip



PACIFIC TYPE LOCOMOTIVE — INTERCOLONIAL RAILWAY.
Total weight of engine, 243,500 pounds; weight on drivers, 154,000 pounds; diameter of drivers, 73 inches; boiler pressure, 180 pounds; cylinders, 23½ x 28 inches; maximum tractive power, 32,400 pounds.

On a 185 mile run at an average speed of 40 miles per hour, these new Pacific type locomotives handle 10 cars and consume 12,884 pounds of coal and 9,750 gallons of water per trip.

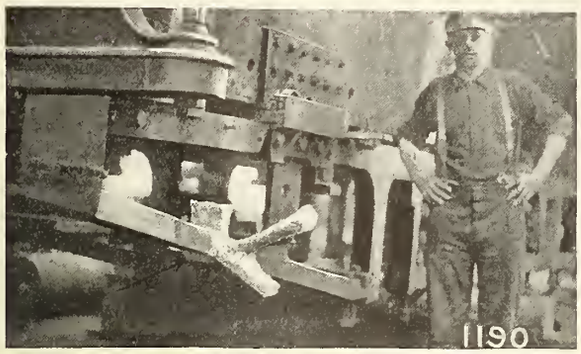
Pacific type locomotives built five years ago, handled 9 cars on this same run at the same speed, but consumed 17,620 pounds of coal and 14,250 gallons of water per trip.

This is a saving of 26.9 per cent. in coal and 31.6 per cent. in water, with one extra car.

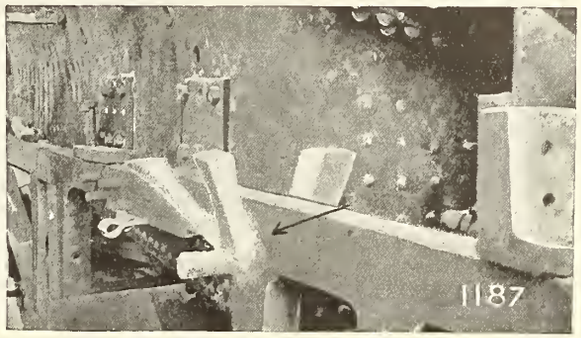
MONTREAL LOCOMOTIVE WORKS, LIMITED,

DOMINION EXPRESS BUILDING, MONTREAL, CANADA

Difficult Frame Welding Made Easy with Thermit



Finished Thermit Weld on Engine No. 802 of the Grand Trunk Pacific, Transcona, Man.



Frame Welded with Thermit by the Illinois Central, Centralia, Ill.

You can weld a frame quickly and economically with Thermit, whether it is broken in the splice, under the fire box, close up to the cylinder, or at any other point. It is not necessary to take the frame down, as all welds can be made with the frame in place.

No other process of welding is so quick and uniformly efficient and economical in operation as the Thermit Process.

The proof is in the fact that to-day 435 railroad shops in North America are using Thermit and returning their engines to service in from 10 to 24 hours.

We have just issued a new pamphlet of instructions for the use of Thermit in railroad shops, known as Pamphlet No. 2144. This should be in the hands of every railroad man, as it tells how and why the Thermit Process of welding will save thousands of dollars every year in repair costs. Write for it to-day.

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Over 7,400 Miles in Operation.

Traverses the Most Fertile Sections of Western Canada.

Thousands of Free Homesteads in the Best Sections Open for Settlement on Its Lines.

Reaches All the Principal Commercial and Industrial Centres.

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Canada's Second Transcontinental

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"Made in Canada" for a Canadian Road

Type of Caboose Car built for Pacific Great Eastern Railway

There is a "NATIONAL" Car for your requirements regardless of what they may be.
If your rolling stock bears a "NATIONAL" Trade Mark it is a sufficient guarantee that only first-class labor and materials have entered its construction.

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Enamelled iron signs are ideal for station name and station door signs.

They are much superior to a painted wooden sign, which has to be repainted at frequent intervals, and they last a lifetime.

There is absolutely no wear to them, and we guarantee that they will not fade or be affected by the weather in any way

We will be pleased to quote you prices on request.

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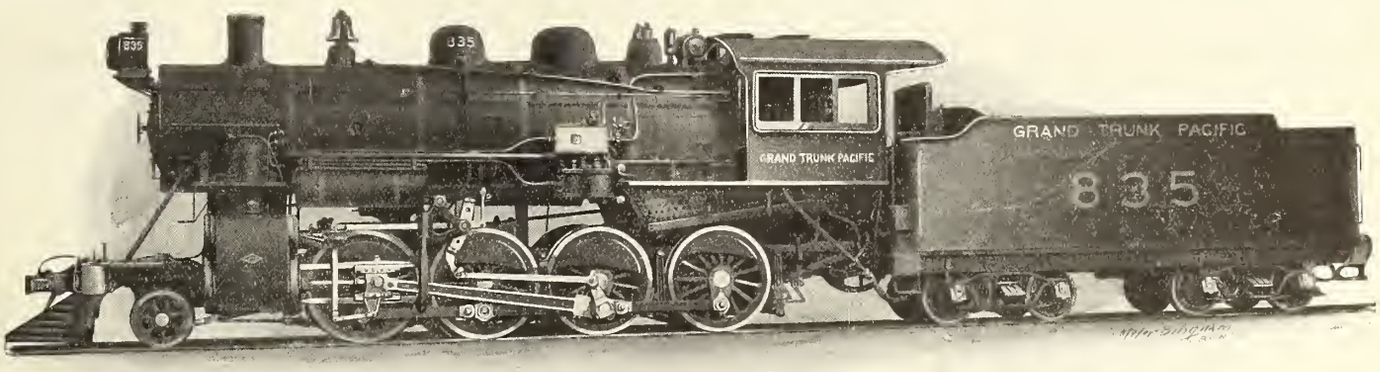


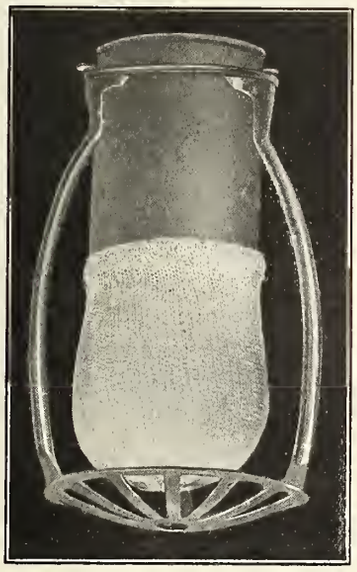
Consolidated Type Locomotive Built for Freight Service on the Grand Trunk Pacific Railway.

LOCOMOTIVES

Long experience, new equipment, efficient management and expert workmen, are guarantees that our Locomotives will give record service. **Over 1,200 Locomotives have been built at our Works since the erection of the plant.** We are builders of Simple and Compound Locomotives adapted to every variety of service, for Railway Contractors, for Industrial Purposes, Mines, all classes of Railway Work, etc.

We are also builders of stationary boilers, suitable for contractors and industrial plants. Grey iron castings—any size or shape—ordinary or intricate—made promptly. New foundry, splendidly equipped. We would be pleased to quote on castings—singly or by contract. We also make drop forgings of all descriptions.

CANADIAN LOCOMOTIVE CO., Limited, Kingston, Ontario



Pintsch Mantle Light

No other system of car lighting gives clean, safe and efficient light without intricate mechanism, subject to defects and failures. Pintsch Mantle Light is the only absolutely dependable method of lighting railway cars.

The Safety Car Heating and Lighting Company

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718 TRANSPORTATION BUILDING, MONTREAL

The Light of Day on the Right of Way

HEADLIGHTS

Commercial Acetylene furnishes a strong, penetrating light without being blinding. Nothing to get out of order. Economical to maintain. Small gas cylinder supplies several weeks' lighting.

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Commercial Acetylene furnishes an ideal system for all kinds of passenger cars. It combines efficiency and economy. Standard cylinder supplies from one to two months' lighting of the average car.

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Commercial Acetylene furnishes an absolutely reliable light. Failures eliminated and cost of maintenance reduced. Cylinder placed at foot of pole supplies several months' lighting without attention.

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Main Office 80 Broadway, New York

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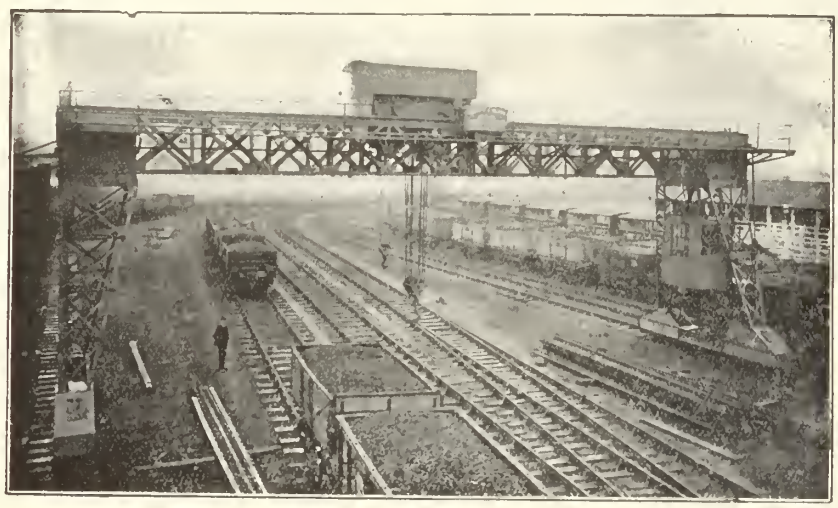

The G. and S.W. Rwy., Albert Harbor Goods Station, Greenock, N.B.
"B. & W." 30 Tons Electric Travelling Goliath Crane, 70 Feet Span

Babcock & Wilcox
LIMITED

PATENT

Water Tube Steam Boilers

Over 15,000,000 H.P. in Use

White-Forster Water-Tube Marine Boilers

ELECTRIC CRANES

For Docks, Railways and Warehouses

Our Book STEAM Sent on Request

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Algoma Steel Corporation, Limited

Manufacturers of

Steel Rails, Splice Bars, Tie Plates, Forging Billets, etc.

We would be pleased to have your enquiries for 1915 deliveries.

Works and Sales Department: Sault Ste. Marie, Ontario, Canada

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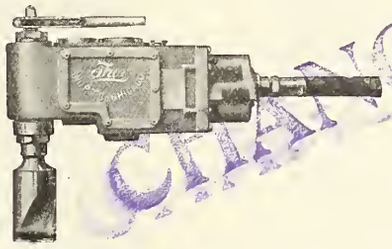
Close Corner Piston Air Drills

Are the Original No.'s 8 and 9 Close Quarter Machines

Equipped with Roller Bearings which reduce friction to a minimum. Guaranteed 30 per cent. more efficient than any other make. Sent on trial at our expense.



Made especially for use in close quarters where the ordinary air drill cannot be operated.

BUILT IN TWO SIZES:

No. 8 for drilling up to 1¼ in. in diam., Reaming and Tapping up to 1 in.

No. 9 for drilling up to 3 in. in diam., Reaming and Tapping up to 2 in.

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W. H. ROSEVEAR & SON, WINNIPEG

Car Bolster Spring with Pressed Steel Caps

RAILWAY SPRINGS

LOCOMOTIVE, TENDER AND PASSENGER CAR SPRINGS of every description.

EQUALIZING, DRAWBAR, BUFFER AND SPIRAL SPRINGS of all kinds.

STREET RAILWAY SPRINGS, from the largest to the smallest.

TRACK TOOLS, RAIL BRACES, TIE PLATES, GUY ANCHORS AND RODS, LOCOMOTIVE SANDERS, CHAIN, Etc.

KEEP STANDING LAST ADVERTISEMENT

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B. J. COGHLIN COMPANY, LIMITED

MONTREAL - - CANADA

DOMINION IRON & STEEL CO., Limited

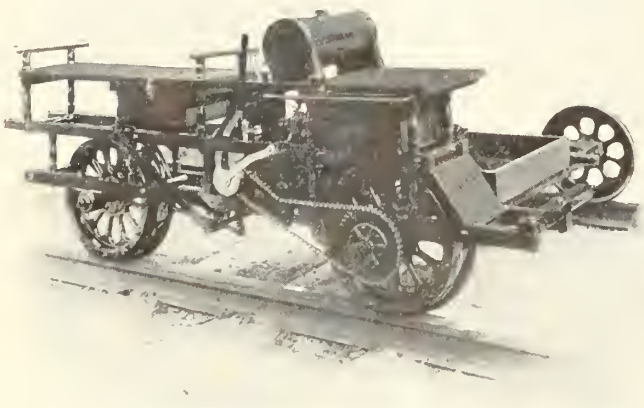
MANUFACTURERS OF

BASIC OPEN HEARTH STEEL RAILS

We will be pleased to have your enquiries for 1915 shipments

HEAD OFFICES AND WORKS **SYDNEY, CAPE BRETON, CANADA**

KALAMAZOO MOTOR CARS



We manufacture several types of motor cars. Write us for information regarding them, and at the same time let us know your requirements.

Kalamazoo Railway Supply Company

The Kalamazoo Improved Pressed Steel Wheel

For HAND and PUSH CARS

Is the most economical wheel ever designed for reason of its improved construction — its extra thickness of metal in throat and flange—its greater strength due to deep corrugations in web, its perfect hub fit, absolutely preventing loose hubs—altogether making its life twice that of any other on the market. Results have made our claim good. If you have not already tried them, please do so and be convinced.

Specify Kalamazoo Improved Wheels on your next requisition.

MANUFACTURERS KALAMAZOO, MICH.

Cable Address "Velocipede" Canadian Agents: Mussens Ltd., Montreal, Que.

The Parmelee Pipe Wrench

PRICE LIST C

Length Handle	Set No.	Pipe Handled	Set Complete	Extra Handle	Extra Girths	
10 in.	1	¼, ½, ¾, 1 in.	$5.00	$2.25	¾, ½, ¾, 1 in.	$ .75
20 in.	2½	¾, 1, 1¼, 1½, 2 in.	7.50	2.50	¾, 1, 1¼ in.	1.00
					1½, 2 in.	1.25
25 in.	3½	1½, 2, 2½, 3 in.	7.50	3.00	1½, 2, 2½, 3 in.	1.25

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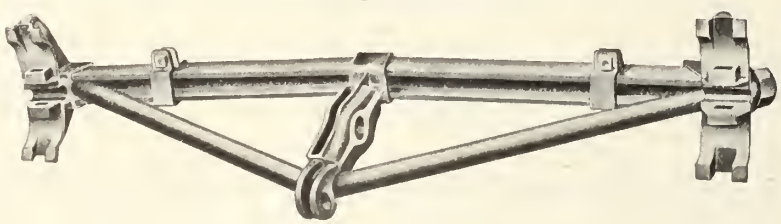

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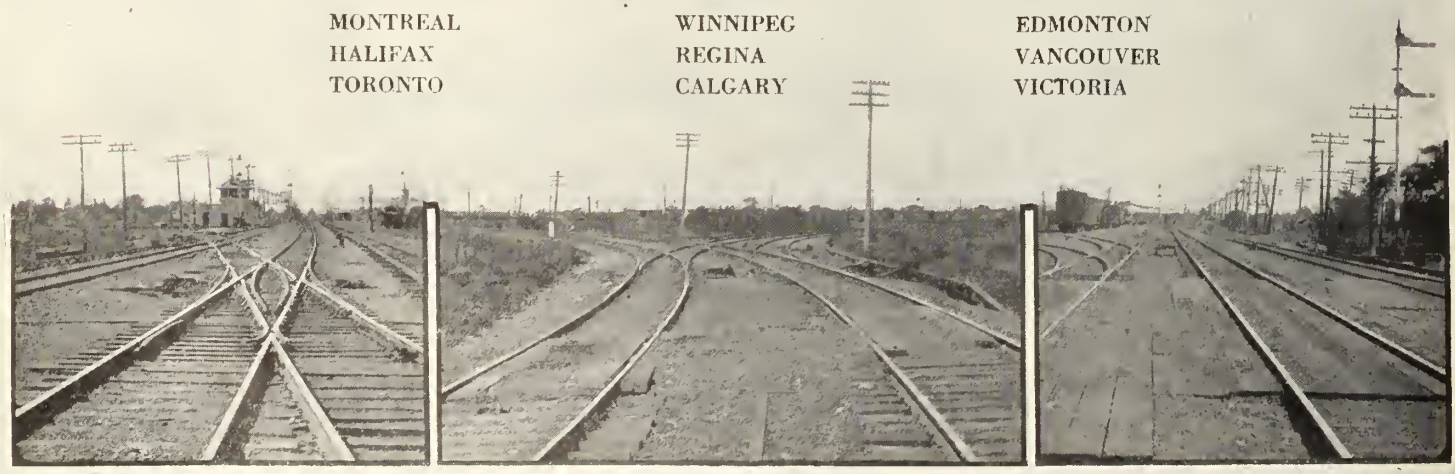


Canadian Railway and Marine World

December, 1914.

The Handling of Snow and Care of Track in Winter.

The Canadian Northern management offered a prize recently to the roadmasters on its lines in Quebec and Ontario, for the best paper on the handling of snow and care of track in winter. The offer elicited a very satisfactory response, six papers being contributed. They were submitted to two judges, C. H. N. Connell, Engineer, Maintenance of Way, Montreal, and R. A. Baldwin, Engineer, Maintenance of Way, Toronto, who awarded the first prize to R. J. Monroe, Roadmaster, Joliette, Que. W. M. Jocklin, Track Inspector, Port Arthur, also submitted a paper which received very high commendation from the judges, but it could not be considered in the competition, which, as above stated, was confined to roadmasters. We are indebted to L. C. Fritch, Assistant to President, C.N.R., for copies of the two papers referred to, which are reproduced herewith.

First Prize Paper by R. J. Monroe, Roadmaster, C.N.R., Joliette, Que.

In dealing with this subject I will endeavor to put in a concise form the methods, which, in my opinion, should be employed in order to obtain the most economical, safe and efficient results. Trackmen's work in winter consists practically of but two units, the clearing or removal of snow and the maintaining of track.

The handling of snow in the province of Quebec, due to its geographical location, is a difficult problem, requiring thorough organization and the co-operation of all those engaged in the operating department.

With the approach of winter a portion of the ballast should be removed from between the ties around all moveable parts of interlocking plants, switches, etc. This is essential in order to facilitate the removal of snow and ice from these parts during the winter. The ends of all crossing planks that remain intact during the winter should be tapered off, in order to minimize as much as possible the damage that would result from flangers catching them while in operation.

The roadmaster, after personally inspecting all snow plows and flangers assigned to him, and having them equipped and made ready for service in good season, should consult with the superintendent and arrange for the proper distribution and assignment of this equipment. An experienced and competent foreman, thoroughly familiar with the district to which he is assigned, should be placed in charge of each snow plow. He should also be familiar with adjoining districts, so as to be in a position to operate over same in case of emergency.

Each snow plow foreman should make several trips over the division every autumn, in order to become familiar with the location of sidings, interlocking plants, etc., which is essential in the successful operation of snow plows. He should also take particular notice of any changes that have been made since the previous winter, such as the installation of new side tracks, or the lengthening of old ones, etc.

At the beginning of the winter the track should be kept clear of snow as long as possible, by the operation of wing flangers on freight or mixed trains, thus avoiding the extra expense of running plow extras. As the season advances and the snow becomes heavy and cuttings get filled, necessitating the operation of snow plow extras, the roadmaster and supervisor of track must keep in touch with the superintendent and chief dispatcher, keeping them well posted as to the condition of the road, and arrange for plow extras when required, and in this respect it is imperative that snow plow extras be run promptly when ordered, and that the best available power be supplied for them. Experience has taught us that failure to promptly operate snow plows during heavy snow storms has resulted in serious blockades, with the ensuing result of congestion of traffic and extra expense all round.

On the return trip of snow plow extras from their operation over the division, or immediately after snow storms, plow extras should be used in winging out and widening the bad cuttings and for plowing out all passing tracks and other through sidings. The prompt and proper handling of snow in passing tracks and sidings, by the use of snow plows, reduces the cost of hand labor, and in addition permits the more prompt handling of traffic after each snow storm, as trains can meet without delay, and cars can be promptly set out or picked up from business tracks.

In heavy cuttings, as well as in certain places in the open country, snow very often accumulates from continual drifting, and in this respect section foremen must thoroughly familiarize themselves with their sections. It is important that they watch closely all such places and give timely advice to the train dispatcher's office, as well as to the roadmaster and supervisor of track, as soon as snow accumulates in such places, so that trains, especially heavily loaded freight trains, may not be permitted to run into such places and become stalled, thereby seriously delaying traffic. Tbey should keep the snow in all such cuttings well shovelled back, so that snow plows during snow storms may successfully operate through them with wings in full operation.

The handling of snow at the larger terminals forms a heavy item of the snow expense, and while no adequate means have been devised for doing this work, except by hand labor, still a great deal can be accomplished by the use of flangers. Foremen in charge of terminals must watch snow expenses very closely and not employ more men than is absolutely necessary. This is particularly so at the beginning of the winter, when the first falls can be handled with a small gang of men and with very little inconvenience to traffic, as the flange is generally clear of ice and hard snow and yard engines can operate with greater ease than later on in the season. Tracks and switches around locomotive houses, water tanks and shops demand very close attention on the part of section foremen. Ice quickly accumulates at such places and unless watched very closely, becomes a cause of derailments. Section foremen in charge of important terminals should keep in touch with the unemployed labor, so as to be in a position to secure extra men on short notice.

Shimming is another problem which trackmen bave to contend with. The extent to which track heaves varies according to the nature of the soil in the subgrade, the amount of ballast underneath the track and the drainage. With a liberal supply of ballast shimming can be reduced to a minimum. It is my experience that the results obtained from shimming do not depend so much on the number of shims applied each day, as the applying of them in the most needed places. When track heaves badly the section foreman should select the worst spots on his section and do the necessary shimming promptly, in order to keep the track in a safe condition for the passage of trains. Some foremen, especially the inexperienced, find it rather difficult to select the worst places and very often spend valuable time and material doing unnecessary work. In order to avoid this the supervisor of track, when travelling over the division, should keep a sharp lookout for rough track and note the extremely bad places on each section and promptly advise the foremen, giving them the exact location of each spot. By doing this regularly all unnecessary shimming will be avoided and the track will show a marked improvement each day.

Spread track, except on sharp curves, is invariably caused by defective surface and line. When track shows signs of spreading, trackmen should at once set to work to remove the actual cause, instead of driving a few extra spikes and leaving the track in bad line and surface, with the result that the track will again spread from the same cause in a day or two.

When leaving for work in the morning the section foreman should always have in mind the places to be shimmed on that day and see that he has the necessary material with him.

When shims exceed half an inch in thickness spikes should be pulled and driven through them. When shims exceed 1½ ins., sufficient long spikes and braces must be used to ensure safety. When shims exceed 3 ins., long shims must be used and an occasional one spiked to the ties.

The most critical time is in midwinter, when snow storms are frequent and of long duration. At such times trackmen find it very difficult to do any shimming and track will continue to heave badly. Bad spots will develop that will become dangerous within a very short time if not attended to. Supervisors of track must watch this even more closely in such weather and keep a sharp lookout for such bad spots and insist on having them attended to at once.

As soon as the snow has disappeared from around the rail, section foremen should go over their section and spike all short kinks into line and shim up all spots which are liable to cause spreading.

We now arrive at the season when the frost will show signs of coming out and shims will "show high." A great deal of rough track at this season can be attributed to two causes, the principal one is that of allowing shims to remain "high" for a certain length of time in order that they may be all taken out at one "pull-

ing." The other is the lack of doing the needful shimming around frogs, crossings, etc., where the frost is retained a longer period. Some foremen neglect this important matter with the expectation that the frost will disappear in a day or two, when in many cases it remains for weeks. As soon as shims "show high" they should be reduced or removed, as the circumstances demand, and the material used elsewhere, such as around public crossings and frogs, as mentioned above.

Where track heaves badly, such as in cuttings, the section foremen should examine it frequently by walking over it and sounding the ties, as the frost is liable to drop out suddenly, leaving a serious defect which is not noticeable on the surface of the rail. Such track as this cannot be inspected properly on a hand car.

All switch ties should now be filled up to insure a uniform departure of the frost and to prevent them getting slack.

One of the most important matters is a daily patrol of the entire section by a competent trackman. This is especially so during stormy weather. It is his duty to keep a sharp lookout for a spread track, broken rails, etc. A very important matter and one that must not be lost sight of by foremen and supervisors of track, is the accumulation of ice in rock cuttings, side hills, around cliffs, or at any other points where the track is liable to be flooded during soft and rainy weather.

Paper by W. M. Jocklin, Track Inspector, C.N.R., Port Arthur, Ont.

Inspection of Track.—There should be a well organized system of inspection on every railway. The entire section should be patrolled every day, and in severe, cold weather it is a good plan to patrol track oftener, especially where traffic is heavy. Inspections should be made in the morning where only one is made; if two inspections are made, one should be in the morning, and one in the evening. The inspections should be made in full daylight. If this work is performed early in the morning and late in the evening during the winter, it is not light enough to enable the section force to detect defects in the track; even broken rails and spread track may be overlooked in this way. The work of inspecting track should not be entrusted to laborers, except in ordinary weather, and then not to any great extent. When making inspection trips with a handcar, all tools for making track repairs should be carried. There should be the necessary danger and cautionary signals on hand cars at all times. When patrolling track on foot, the track walker should always carry a track wrench, spike maul, four torpedoes, and two red flags. In bad snow storms, heavy fogs, and at night, a red light should be carried in addition to the above signals. The section foreman should ride over his section at least once a week, on a locomotive, noting carefully bad spots in track, which will be readily felt while on the locomotive. He should then examine the track carefully where rough spots were observed, and get these places repaired as soon as possible. If this is properly done, it will greatly improve the riding of the track.

Preparing Right of Way for Winter.—Right of way through timbered sections should have the brush cleared each autumn for a distance of at least 12 ft. from rail, and every second year the entire right of way should be brushed. If this is done during August or September, and burnt as soon as sufficiently dry, it will be but a matter of a few years until the brush and undergrowth will be entirely killed out. Vegetation should not be allowed to stand along the track during the winter, as it will cause snow to drift in on the track, and a great deal of unnecessary trouble and expense.

Right of way on open prairie sections should have the grass cut each autumn, for a distance of 10 ft. from the rail and a strip about 8 or 10 ft. wide should be cut along the extreme outer edge of the right of way. If this is done and burnt as soon as sufficiently dry, the remainder of the right of way may be burnt with a great deal less danger of fire.

Preparing Track Switches and Roadbed for winter.—To get the best results from track during the winter it should be gone over in the autumn, and any inequalities as small as a fourth of an inch must be taken out and all ties brought up to the rail, so as to give the rails an even bearing on all ties, and put the track in perfect line. All damaged rails should be changed out, worn frogs and switch points renewed, and all bolts properly tightened. The gauge of track must be looked after very closely, so as to make sure that there is no spread track whatever at the beginning of winter. All spikes should be driven down, so as to hold the rail firm to the ties. This will greatly lessen the guttering of ties, it is also a good preventive of spread track, as it will have a tendency to keep snow from getting between the base of rail and tie.

The ditches in cuts should be examined closely, to see that nothing has accumulated in them that would in any way block the flow of water in the spring when the snow is melting. The ends of culverts, where there is not a continuous flow of water, should be boarded up and a long stick driven down at each end, so as to enable the section men to find them at the first signs of a thaw in the spring, when the boards should be removed and the snow cleared from the ends, so as to allow a free passage for the water. I have found it a very good plan to open up ditches in cuts, especially those that have a considerable amount of snow in them.

In the autumn, before the ground is frozen, all track signs should be straightened and put in proper shape, making sure that all bridges, road and farm crossings and switches are protected by flanger signs. Ballast must be removed from between ties on turnouts just underneath switch points, guard rails and frogs, to a depth of at least 4 ins. If this is done, the switches can be cleared of snow and ice at a great deal less trouble and expense. An old shovel and broom, hung to a post set near the switch stand, will be very handy for train crews wishing to use the switch during snow storms. Interlocking plants should be thoroughly cleaned out as to dirt, which may have accumulated from any cause. All debris and vegetation which may have accumulated underneath pipe lines for interlocking plants, must be thoroughly cleaned out to a depth of 6 ins., so there will be no possible chance for snow to drift around the plant.

A small amount of salt may be used in switch points, frogs and guard rails to good advantage in severe weather and when there are frequent snow storms, but in no case should it be used on interlocking plants. If it is used on detector bars, pipe lines, and locks of the plant, it will rust them and shorten the life of the plant.

Shimming of Track.—There is no work connected with track repairs requiring more care and judgment than shimming. All mud ballasted track, and even track properly ballasted with gravel, will heave in spots from the action of the frost, and heaving spoils the surface of the track. Inequalities as small as a fourth of an inch should be corrected by shimming the track. Shims should be made of hardwood, and those of half an inch thick and over must have holes bored to receive the spikes. The practice of placing shims, larger than half an inch thick, angling on tie, should not be allowed. All spikes should be drawn, holes plugged and ties edged off to a smooth and even surface, before placing the shim. It should then be placed underneath the base of rail, parallel with tie, and securely spiked.

Where shims exceed an inch thick, shimming spikes, 7 or 8 ins. long should be used. For 4 in. shims, a 3 in. plank and a 1 in. shim should be used, and for a 5 in. shim, 5 by 8 in. timber should be used. Wherever planks are used for shims, they must extend under both rails and be secured to tie with shim spikes. All shimmed track must be well braced, this is best taken care of by using a shim about 1½ in. thick, placing one end against the rail and spiking the other end to the tie. These braces should be used on every third tie, and under no circumstances should shims an inch thick be used on curves, without spread ties or rods being used to protect the gauge of the track. All shimmed track must be closely watched, especially high shimming. The snow should be cleaned away from the spikes on shimmed track at least once each week, and oftener if track is still heaving, in order to see that track is not spreading, that all braces are in proper shape, and that shims are not broken or crushed underneath the rail. If this rule is rigidly enforced, derailments caused by spread track and broken rails will be prevented. Too much care cannot be given to shimmed track. Where high shims have been used, it will be found necessary in the spring to replace them with smaller shims, as the frost leaves the ground (this is commonly called reducing shims), and this process will have to be followed up from time to time until the track has so settled as to make it possible to remove all shims. After shims have all been taken out, it is a good plan to take them to the car house, unless there is a very large amount of them, in which case they should be piled in neat piles at the emergency rail rests.

The heaving of track may be greatly lessened by having good drainage in cuts. The ditches in cuts should be so constructed as to carry the water off as fast as possible. Water should not be allowed to stand in cuts and along track, as it will soak into the roadbed, and not only make rough track, during the summer, but will cause it to heave a great deal worse during the winter. Poor drainage is the cause of a great deal of rough track, during both winter and summer. Another good remedy for bad heaving spots is to remove the clay from underneath the track to a depth of at least 4 or 5 ft. and fill in with good clean gravel. This work can be done by the section force and in no way endangers the safety of track. The best method of doing this is to have the gravel unloaded at the site where it is intended to be used, using one side of track for this, and the other side for the waste material that is taken from under the track. Both ends of the spot can be worked at the same time. After having placed a slow order on track, and putting out the proper cautionary signals, remove two or three ties from track and use them as a stringer running parallel with the track, bedding them in, so as not to disturb the surface of the track. Then proceed to remove the clay from under the track, taking a strip about 4 or 5 ft. long and the width of track. When this spot is dug out, fill in with gravel, take out the ties that were used as stringers,

placing them in their former positions, tamping them well. When this is done, repeat the process until the spot is completely dug out. Wherever this is done, there will be no more heaving and the company will be amply paid for the trouble and expense of removing the clay from the roadbed.

Placing Snow Fence.—As the greater portion of railways in the northern countries run in one general direction, which is east and west, and are exposed to severe and repeated snow storms, there should be some protection against drifting snow. This protection is best provided in the form of fences. Their efficiency will depend upon the strength, height, position and distance from the track. The fence should be placed at such a distance from the track that when drifted full the snow will not reach closer than 25 ft. from the track. The fence should be set up from track 12 ft. out for each foot in height of fence, thus if the fence is 10 ft. high it should be 120 ft. from the track, and so on, according to height of fence. As the general direction of the railways is east and west, the greater portion of the fence will be required on the north side of track, as the severest snow storms come from the north and west. It is a good plan to have the fence extend parallel with the track for the entire length of the cut, until nearing the ends of the cut, when the fence should be gradually drawn in, so as to be about 50 ft. from the track. This is to prevent snow from filling up the ends of the cut. I have found that snow walls properly built are of great value, and are often used in place of fences, where there is not too heavy drifting and the expense of permanent fences is not warranted. Snow fences should be set up in plenty of time, so as to avoid being caught with an early fall of snow, which may drift the cuts full and cause serious delays and unnecessary expense.

Clearing Switches, Interlocking Plants and Road Crossings.—During snow storms switches and interlocking plants must be kept cleared of snow, so as to be in working order at all times, especially interlockings, as it requires but very little snow to render them useless. There should be a sufficient amount of maintenance force on hand to keep them cleared of snow, either night or day, during storms, and as soon as the storm is over, the switches must be thoroughly cleaned out and station platforms and public road crossings cleaned off, and the flange way picked out. When clearing switches and interlocking plants of snow, it will be found a good plan to remove the snow from between the rails over the entire turnouts. If this is done it will prevent them from filling up with ice, and also keep the spikes clear, which will greatly aid the section force in holding track to gauge in turnouts.

Preparing Track for Snow Plow.—As soon as the condition of the track has been reported after a severe snow storm, the section foreman should take his force and put his section in shape for the snow plow. In cuts where the snow is drifted to a depth of 3 or 4 ft. the track in both ends of the cut should be cleared of snow and flanged out to where the snow has a depth of 2 ft. Snow is most apt to cause derailments where it is of slight depth and frozen to the rail, and this most frequently occurs at the ends of cuts, and by cleaning the cuts in the above manner the danger of derailments is avoided.

Snow Reports.—Immediately after a heavy snow storm the section foreman should ascertain the condition of his track, noting which cuts are drifted full and which are clear. These facts should be reported immediately to the roadmaster, in order that preparations may be made to clear the track. If the section is clear, it should be so reported.

Snow and Its Effects and Handling Snow Plow to Open Line.—All roads in the northern countries are obliged to contend with snow, and in the northwest especially. The keeping of the track clear constitutes one of the main items of cost of track maintenance. Snow must be contended with in many forms, the most common of which is drifted snow, but it is almost equally as difficult to contend with it when it fills the flanges of rails with ice, or when in melting and freezing it fills the track ditches, and flows over the track, covering the rails with ice and threatening derailment to the first passing train. The clearing of the track of snow belongs to the roadmaster's department, and is of vital importance to a railway. A man should be thoroughly competent and familiar with the best methods of "bucking" snow, before taking charge of an outfit to open up the track for traffic after a blockade. Before starting out on the road he should be thoroughly informed as to the condition of the amount of snow in cuts, especially the length and depth of the worst drifts. Locomotives in first class shape should be furnished for this work, and locomotive men that are familiar with the road should be furnished. The snow plow, if not a rotary, should be one of the best make and able to deliver the snow out of a 10 ft. cut. I have found that a snow plow that is independent of the locomotive, is best. It should have wings that can be let out or taken in as the conditions require. Snow plows differ a great deal as to make and design, but I would sugest one of the above mentioned style. A snow plow of this type should be carried directly ahead of the locomotive where heavy drifts are expected, and it is probable that one locomotive will not be able to handle the plow successfully. The second locomotive should follow close behind the first locomotive and plow, so as to be in readiness to assist when needed. No car or caboose should ever be placed between the two locomotives. When conditions of the above nature are known to exist, the second locomotive should carry a car of coal and a water car in the train. It is also a good plan to carry a bunk car of some kind, for sleeping quarters for laborers, especially when it is not known how long it may take to open the line. When the snow is reported hard, each drift should be carefully examined and its height and length noted. If the drift has not been faced by the section men (that is, shovelled out from the end of the drift to where its depth is about 2 ft.), it should be done before a run is made with the plow, for if this is not done it may cause derailment. Wherever the second locomotive is used in "bucking" snow, it should be uncoupled from the cars that it is handling. A run for a drift should never be made while locomotives are handling anything other than the snow plow. If it is not absolutely necessary to use both locomotives, it is a great deal safer and better to use but one. If snow is not too hard, a drift from 3 to 6 ft. deep and 600 to 800 ft. long can be cleared in one run. There is comparatively no danger in "bucking" soft deep snow at top speed.

The locomotives with a snow plow outfit should take fuel and water to their full capacity, at every point where it can be obtained, as unforeseen delays may be encountered. Each locomotive in the outfit should be equipped so as to be able to syphon water from the emergency tank that is carried. I have also found it a good plan to have a steam hose attached to the locomotive, as it can be used to thaw the ice and snow from the machinery and the track rails. When "bucking" snow, the speed of the locomotive should always be regulated by the length and depth of the drifts. An experienced locomotive man will regulate the speed so as to leave very little work for the shovellers; therefore the necessity of an experienced locomotive man. The locomotive's whistle should always be sounded before entering a cut, so as to give warning to those who may be working there. When it is necessary to make the second run for a cut the whistle must be sounded and make sure that all hands are out, as it is almost impossible to climb out of a snow cut when first opened up.

When the snow is both deep and hard, the rotary plow should be brought into use, if one is available, if not the crust should be shovelled out before any attempt is made with the plow, as "bucking" deep, hard, crusty snow without having the crust broken is very severe work for a locomotive and is dangerous for trainmen. It is better to have a little delay and be on the safe side; however, it is not advisable to start clearing the track of snow during the storm, especially a heavy storm, but be in readiness to start at the first signs of the storm abating. Cuts, where road crossings are located in them, must be dug out and the flangeway cleaned out before making a run with the plow. If a pilot flanger is attached to some locomotive which is making daily runs over the line, it will be found a great help in keeping the rail clear and the flange open. A local passenger locomotive, or local freight locomotive, should answer this purpose, and the running of the snow plow should not be confined entirely to the opening of the line, but it should be run occasionally during open weather. When being used on these trips it is not necessary to have a special locomotive for this purpose, as I have quite frequently seen the plow attached to a local freight. The benefit derived from running a plow in this manner is that the wings of the plow can be opened, and any snow that is drifted in near the track levelled down, and the line thoroughly flanged out, which will greatly benefit the line and make the handling of traffic much easier, besides it will take much heavier snow to block traffic than if it was left piled up close to the track.

The Intercolonial Ry. Efficiency Association held its regular monthly meeting at Sydney, N.S., Nov. 1, when the recently inaugurated merit and demerit system was discussed and adjourned to the December meeting. It was announced that about 200 of the I.R.C. employes had gone to Europe with the Canadian contingent for war service, and that their pay would be continued, each man filling up a form indicating the person to whom his pay cheque was to be made payable.

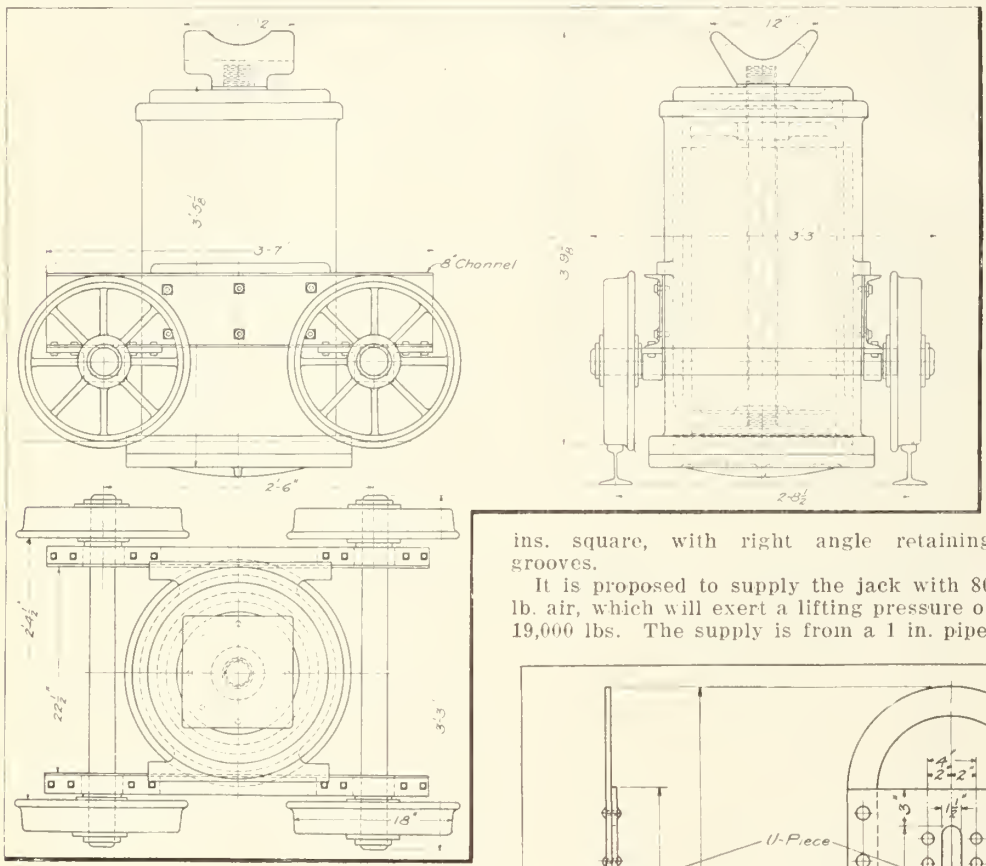
Railways in the United Kingdom give names to their passenger locomotives, and since the war, several of these names have fallen into disfavor. To keep up with the popular taste, the London and North Western Ry. has changed the name of its locomotive Germanic, to Belgic, and the Great Western Ry. has changed its Knight of the Black Eagle, to Knight of Liege.

With drop forge dies, a very good practice after the impressions have been sunk and completed in the die block, and before the dies are tempered, is to try them by pouring a lead casting, which will form a lead proof, showing any slight changes that may be required.

Railway Mechanical Methods and Devices.

Drop Pit Jack on Canadian Northern Railway.

A 10 ton drop pit jack, of the design shown herewith, has been made standard for use on the C. N. R. Of light construction, it is



10 Ton Drop Pit Jack on Canadian Northern Railway.

to be used for the removing of driving wheels, tender truck wheels and car wheels, and general repair pit service. While small in size, the telescopic action of the cylinder gives it as great a range as the larger jacks commonly in use, and it can be employed in pits only 5 ft. 5½ ins. deep.

The outer jack cylinder is carried by two lugs on the side, on two 8 in. channels, 3 ft. 7 ins. long, one on each side, to the under side of which, near each end of the channels, are bolted bearings at 2½ ft. centres. The axles carried in these hearings are 4½ ins. diam., with a 3 in. wheel fit, and are 3 ft. 3 ins. long. The wheels are 18 ins. diam., and have a spread of 28½ ins., to suit the rail centres of 32½ ins.

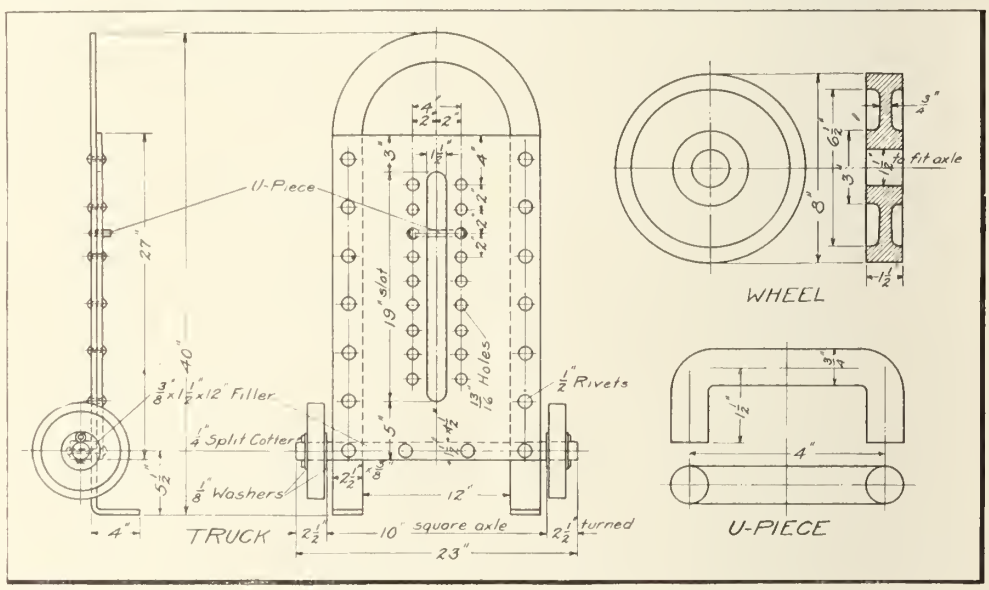
The jack proper consists of two telescoping cylinders, the inner one having a bore of 16 ins., and containing a piston of the same diameter, having three ½ in. packing rings. The inner cylinder, which, in a sense, is an outer piston, is 20 ins. diam., and is similarly fitted with packing rings. That a combined lift of 4 ft. is possible is due to the fact that the inner piston on reaching the top of its stroke, that is when it strikes the head of the inner cylinder, the latter, which as explained is also a piston, is carried upward until its flanged rim strikes against the stop collar of the outer cylinder. This makes it possible to operate in the 5 ft. 5½ in. pit, which is deemed to be a considerable advantage from the fact that it is more convenient for working, and much less dangerous. The top cover for the inner cylinder head is secured by twelve ⅞ in. studs, and the ring passing around the inner cylinder and fastened to the main cylinder is secured thereto by eight 1 in. studs, countersunk flush with the top face of the ring. The block on the upper end of the piston is 12 ins. square, with right angle retaining grooves.

It is proposed to supply the jack with 80 lb. air, which will exert a lifting pressure of 19,000 lbs. The supply is from a 1 in. pipe, fitted with a cut out valve and check valve. The exhaust is of similar size. A rubber hose connection is made on the far side of the cut out valve on the supply line. A ½ in. air release vent is fitted to the top cover of the inner cylinder, to enable the latter to fall back into its inactive position.

Cylinder Head Truck on Canadian Northern Railway.

The C. N. R. mechanical department has developed a handy truck for handling front cylinder heads, and placing them in position on the cylinders, which is illustrated herewith. The main part of the frame consists of a U member, 40 ins. long, of 2½ by ⅜ in. bar iron, the ends of which are bent at right angles to form 4in. shoulders. Across the face of this U form, there is a sheet of ⅜ in. plate, rivetted to the legs of the U, and with a 19 in. slot down the centre. Each side of the slot there is a row of 13-16 in. holes at 2 in. centres, in which may be inserted a U piece for a stop, this U piece being made of ¾ in. round iron. Near the base of the U frame, there is a 1½ in. square axle, the ends of which are turned for 1½ in. journals, with 8 in. wheels on the end, held in place by washers and cotter pins.

The cylinder head is placed on the truck with the lifting stud projecting through the central slot in the truck facing. On the end of the stud which projects through in this manner, there is secured a nut and washer, which holds the head securely on the truck. The head is adjusted in position, so that when the truck is swung up into its vertical position, the head will be practically in position to slip over the cylinder studs. The U piece mentioned is placed in the correct pair of 13-16 in. holes alongside the slot, and the head may be adjusted when the truck is in its vertical position by using a crowbar in the slot, resting on this U piece. By moving the truck forward, the head may be slipped over the studs.



Cylinder Head Truck for Fitting Heads without a Crane.

Montreal Harbor Commissioners Ry.—We are officially advised that the commissioners are not at present contemplating changing the operation of the lines on the Montreal Harbor property from steam to electricity.

The Canadian Northern Ry. moved into its new offices in the McLeod Block, McDougall Ave., Edmonton, Alberta, Nov. 2. The ticket, telegraph, express and freight offices are now located in the one building.

Surface Plate for Lathe Work in Timiskaming and Northern Ontario Railway Shops.

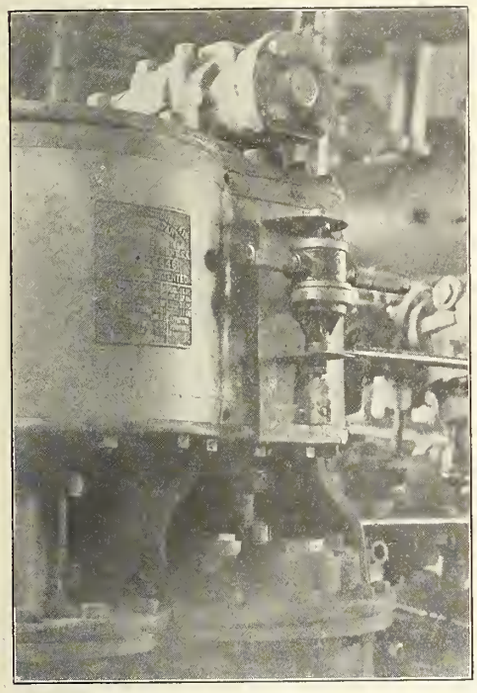
The use of the horizontal boring mill in railway shops has become so general that a great many mechanics would find it difficult to otherwise handle a job that would ordinarily be performed on such a machine. It is almost universally employed for boring holes which parallel plane surfaces, these latter being usually finished in the planer,

and then removed to the horizontal mill for boring.

In the T. and N. O. Ry. shops, at North Bay, Ont., a satisfactory substitute for the horizontal mill has been found by the use of a surfa e plate on a large engine lathe, the member to be bored being bolted thereto. An old slide valve cover plate, about 24 ins. square is used. In each corner of this cover plate there is a bolt hole, from the under side of which passes a long bolt, threaded through the greater part of the length, and with a nut on both sides of the plate. These four bolts may be secured in the T slots of a lathe carriage, and on this base the surface plate may be levelled in the position required with regard to the lathe centres. The work to be bored is bolted to this surface plate, and the tool is carried on a boring bar between the centres, the work moving with the carriage to secure the feed.

Grinding in Air Pump Valves, Timiskaming and Northern Ontario Railway Shops.

Instead of grinding in the poppet valves used on locomotive air pumps, there has been developed by C. Batley in the T. and N. O. Ry. shops at North Bay, Ont., a method of handling this work by means of a small air motor to provide the power. These poppet valves have a small vertical displacement on their seats, being stopped in their upper position by brass valve caps, which are screwed in the top of the cylinder casting. The device under consideration employs the threaded opening into which these plugs normally fit, an auxiliary plug performing the work.



Small Motor Mounted on Air Pump for Grinding in Poppet Valves.

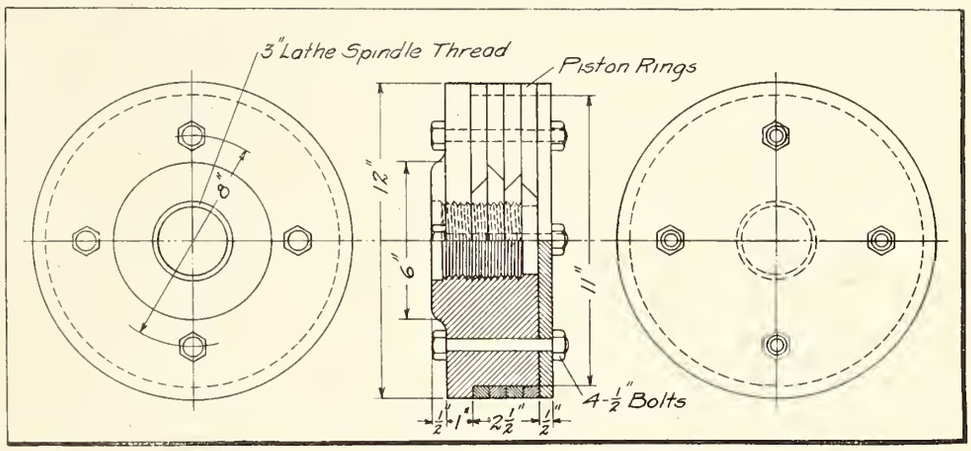
This auxiliary plug is hollow, and contains a thin disc in this hollow space, normally kept in its bottom position by a coiled pump spring, this disc being kept from falling out by an inner collar. When this plug is screwed in to its seat, the coiled spring inside seats the valve firmly on its seat. Through the centre of the auxiliary plug, there is a small hole, through which a small spindle passes, being screwed into the seated valve.

On the outer face of the steam cylinder, there is mounted in a sheet metal frame, which is attached to the cylinder by the cylinder head bolts, a small air motor, which is maintained in a stationary position. Between the air motor chuck and the head of the valve spindle, which projects through the auxiliary head, there is a universal joint connection, by means of which the spindle can be revolved. The universal joint connecting link is extensible, so that any one of the three valves may be operated on from the one position of the air motor.

In operation the air motor is mounted as shown in the accompanying illustration. The regular valve plug is removed, and the valve, with a grinding compound of glass dust and oil seated. Into the top of the valve, the auxiliary spindle is screwed, and over it the auxiliary valve head is slipped and screwed into position. The universal joint connection is applied, and the motor set in operation. The pump spring in the auxiliary head keeps the valve seated tight enough for the grinding in operation, which is continued just so long as is necessary. To apply more cutting compound, it is only necessary to unscrew the auxiliary plug, lifting the valve, and exposing the contact faces. The apparatus works admirably, we are informed.

Piston Ring Turning Jig, Canadian Pacific Railway North Bay Shops.

The piston rings that are cut from a stock sleeve and slotted, with a piece removed for springing purposes, require to be finally turned on the outside after springing, in order to insure a correct circular form. A jig has been developed in the C. P. R. shops at North Bay, Ont., for doing this work expeditiously. It consists of a solid head, that screws on the end of the headstock spindle of a lathe, on which the rings to be turned are slipped, and clamped in position for machining, by means of a circular plate, secured on the end of the head by four ½ in. bolts.



Piston Valve Ring Turning Jig.

The rings, as first turned and slit, are slipped over the body, and encircling their outer diameter, there is placed a circular band of steel, the ends of which can be drawn together by a clamping bolt. When this latter is clamped down as tightly as possible, the end plate is tightened up, securing the rings in place by end pressure, when the outer band may be removed, and the turning proceeded with. Rings may be quickly handled in this manner.

Grade Crossings Elimination on Intercolonial Railway at Moncton.

Plans have been prepared for the elimination of a number of grade crossings on the Intercolonial Ry. in Moncton, N. B. The proposed work consists of a subway at Main St., overhead bridges at Victoria St., Church and St. George Sts., and a new bridge at Union St. At Queen and Lutz Sts. a pedestrian subway is to be built, with an entrance on the west side of the tracks at the corner of Queen and Lutz Sts., and at the east side of the tracks there will be an entrance from both Queen and Lutz Sts. Between Robinson and Main St. a sidewalk 6 ft. wide is to be built along the west side of the railway property. The railway will also make all necessary changes to the sewers and pipe lines with which the scheme will interfere. Where the grade of Main St. is changed the railway will put in a modern pavement, and where there are changes in the other streets macadam pavements will be built.

In order that this scheme may be carried out the railway will have to change the grades of its tracks between the station and a point about half a mile beyond Union St. The base of rail at Main St. will be raised 6 ft.; at the west side of Lutz St. there will be practically no change; at Victoria St. the tracks will be lowered 12 ft.; at St. George Street 18 ft., and at Union Street 9 ft.

The principal grade crossing to be eliminated is that at Main St., and this is to consist of a subway the full width of the street. In order to do this the tracks will be raised 6 ft. above the present level of the street, and the street will be lowered 11½ ft. at the railway tracks, which is only 4¾ ft. lower than Main St. at the corner of Lutz St., and only 2½ ft. lower than Main St. at the corner of Robinson St. To lower Main St. as proposed at the tracks it will be necessary to start the depression of Main St. on the west side of the tracks at Bonacord St. and on the east side of the tracks opposite McBeath's grocery store, that is Main St. will retain its present levels at Bonacord St. and at McBeath's grocery store.

As Archibald St. is opposite the proposed subway on Main St. it will be necessary to depress this street in order to get an entrance to Main St., and it is the intention of the railway to widen the street about 30 ft. at Main St., and to gradually narrow this extra width in until about opposite the north boundary of the H. S. Armstrong property, where the street will retain its present width and levels, the depression of the street starting at this point. The sidewalk on the east side of the street will be maintained at its present level, with an easy flight of stairs to Main St., and a sidewalk will also be built on this side of the new

street level, thus having two sidewalks, one on the higher level and one on the lower level and the space between these two walks will be terraced and sodded.

Foundry St. will only be depressed very slightly, as the depression will only start at the east side of Cable St. At the subway there will be an entrance from Main St. to the station grounds by means of an easy flight of stairs.

The subway proper will consist of solid steel construction, but for ornamental purposes will be encased in concrete. The concrete will be panelled and the surface specially finished to give it an artistic appearance. Ornamental lights will be placed on the face of each end of the subway, and on the ceiling above the sidewalks, so that the subway will be brilliantly lighted by night.

Where Victoria St. crosses the tracks there is a slight grade downwards towards Church St., and in order to put an overhead bridge at this place it will be necessary to raise the road level 11 ft. The approach to the east end of the bridge will start about 70 ft. west of Church St., and the approach to the west end of the bridge will start about 40 ft. west of Robinson St. This bridge will also be of solid steel construction encased in concrete, panelled and finished similar to the Main St. subway.

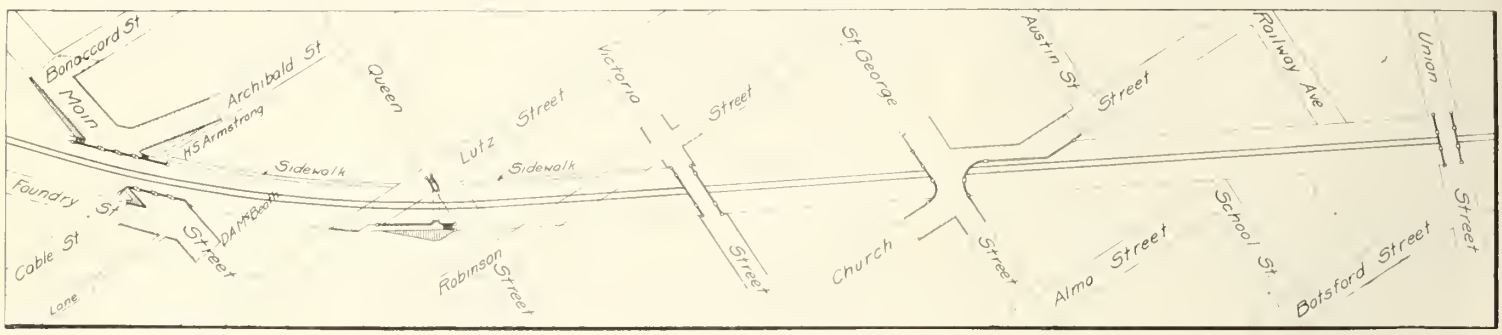
At present Church and St. George Sts. cross the present tracks at a level considerably lower than the original surface of the streets. This depression in the streets will be taken out and the new level will be practically the same as the original street level. At this place the proposed bridge is to be the full width of St. George St., and will be built so that St. George St. from the east will gradually curve round into Church St. This bridge will also be of solid steel construction, encased in concrete, with the same style and finish as the Main St. subway.

The present bridge at Union St. will be removed, and a new bridge of similar design to that of Victoria and St. George Sts. will be put in. The street level over the tracks at this place will be brought down to the original surface of Union St., this practically making a level roadway at this place.

The pedestrian subway at Queen and Lutz Sts., which the railway will build, will be 10 ft. wide and 8 ft. high, will be of original construction and will be lighted with ornamental lights. The entrance to the subway on the west side of the tracks will be by an easy flight of steps, and the entrance on the east side of the tracks will be by another easy flight of steps from Queen St. and by a slight incline from Lutz St.

In the Main St. subway there will be pillars in the centre of the street, which are absolutely necessary to prevent further depression of this street. In order to make one single span across Main St. it would be necessary to depress the street at least 4 ft. more than it is at present contemplated. Many of the subways in the larger cities in Canada and elsewhere have a similar arrangement to the one on Main St., and in many cases it is considered more or less of an advantage as it divides the traffic in opposite directions. The railway proposes to make all these crossings of the most modern construction and ornamental design so that when the scheme is finished it will be a big improvement to the appearance of that part of the city. The proposed improvements will cost in the neighborhood of $500,000, and should add greatly to the comfort and safety of the citizens by eliminating the danger of level crossings, and also the blocking of streets. It is the intention to start only the Main St. subway this year, and the contract for it has been given to Soper and McDougall, Ottawa.

We are indebted to C. B. Brown, Chief Engineer, Canadian Government Railways, for the foregoing information.

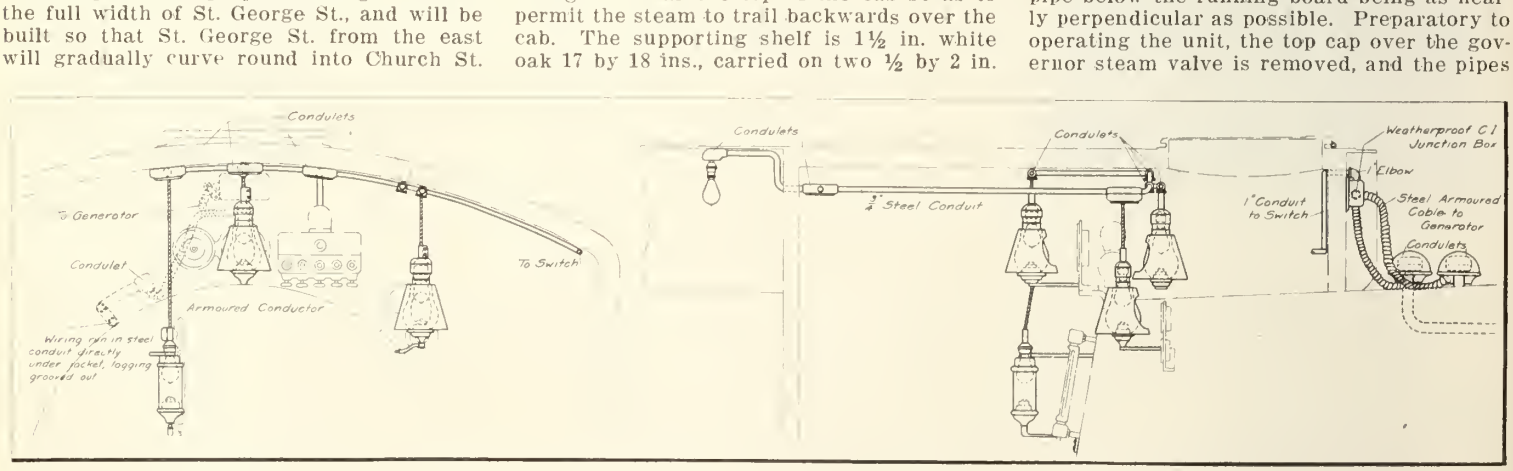


Grade Crossings Elimination on the Intercolonial Ry. at Moncton, N.B.

Locomotive Headlight Installations on Canadian Northern Railway.

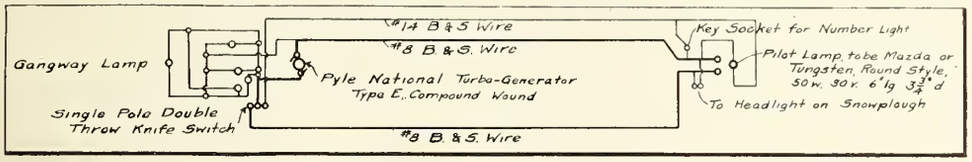
The C. N. R. Mechanical Department standardized its locomotive electrical installations recently, so that the manner of installing, and the nature of the wiring, as well as all the parts entering into the installation, have been reduced to a standard form, applying to all road locomotives on the system. The generator is of the Pyle-National E type, located immediately in front of the cab, crosswise of the boiler, with the generator on the left hand side, with a 2 in. exhaust pipe bent at an angle of 45°, just long enough to clear the top of the cab so as to permit the steam to trail backwards over the cab. The supporting shelf is 1½ in. white oak 17 by 18 ins., carried on two ½ by 2 in. wrought iron forged supports, at 12¾ in. centres. On the left side there is a ½ in. grab iron. The generator is secure to this stand by four ½ in. bolts, carrying fibre washers and bushing to thoroughly insulate the generator. Steam for operating the unit is to be as dry as possible, supplied through a ½ in. steam valve with metal disc and seat, and so located as to be conveniently accessible from the engineman's position. If the valve is necessarily inaccessible, an extension rod on the valve handle is used. The steam pipe is of copper, installed without pockets, and arranged to drain towards the boiler. Only ball or taper joint unions, with no gaskets, are used. The drain from the turbine is of ⅜ in. pipe, contains no valve, and is free from bends, extending below the running board and close to the draught opening of the ashpan, the pipe below the running board being as nearly perpendicular as possible. Preparatory to operating the unit, the top cap over the governor steam valve is removed, and the pipes blown free from dirt and scale.

A diagrammatic plan of the wiring is given herewith. The main leads and arc lamp circuits are of no. 8 B. and S. stranded slow burning weatherproof triple braid wire, black outside, the three wires in one cable, and all other wiring is similar, but no. 14 stranded. The headlight will contain an arc light and



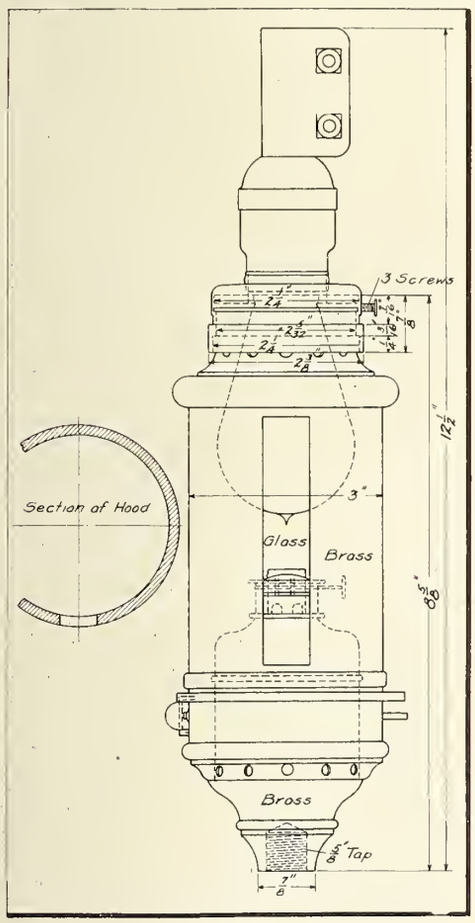
Cab Electric Light Installations on C.N.R. Locomotives.

a pilot lamp, the latter either mazda or tungsten, 50 watts, 30 volts, 6 ins. long overall and 3¾ ins. diam. The wiring and lights in the cab are also shown in an accompanying illustration, which shows an 8 c.p. steam gauge lamp, 8 c.p. air gauge lamp, 8 c.p. lubricator lamp, 8 c.p. water gauge lamp and 8 c.p. deck lamp in gangway, all either tungsten or mazda lamps.



Diagrammatic Wiring on C.N.R. Locomotives.

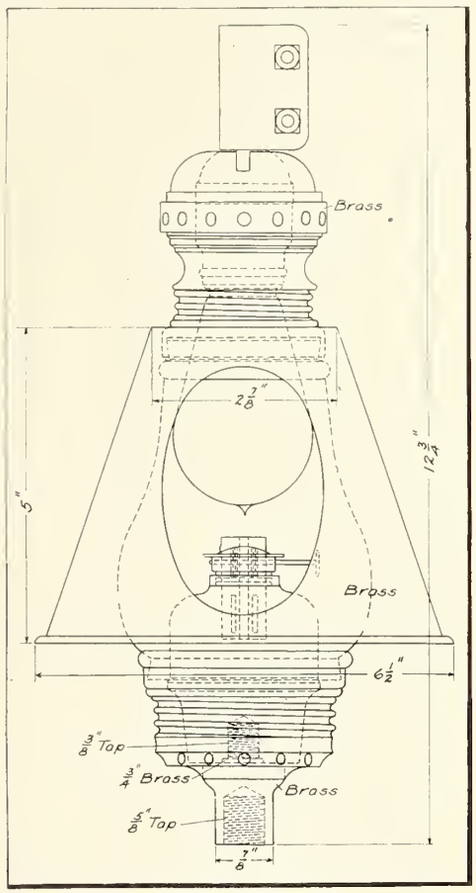
All the wiring to the cab and deck lamps is protected by 10 amp. fuses and blocks. The leads from the generator pass through a triple to a double plug cut out, and are protected by two 40 amp. 250 v. refillable cartridges, with the fuses all placed on a 60 amp. cut out block. The positive wires are tested by ringing with a magneto or some bell arrangement, and not by running the generator. The arc lamp lead is tapped for the pilot lamp at a point just within the case, and not inserted in the binding post within the arc lead. All wire splices are soldered and covered with friction tape, all socket and receptacle cover screws are soldered in place, and all wire connections in the sockets are soldered, making it impossible for screws to back out. All wires are soldered to switch



Lamp for Water Glass.

terminal posts. All armoured wire enters the sockets through a standard pipe bushing, to which it is soldered to prevent loosening the socket connections. There is a 40 amp. single pole double throw knife switch above the engineman's position, just over the window casing, operating, in its lower position, the arc lamp, and in the upper position, the pilot lamp.

All the wiring both inside and outside the cab, with the exception of the short connections between the generator and the junction box on the front of the cab, which is in flexible armoured steel conduit, is carried in steel conduit, with bushings where the wire passes in and out of the conduit or through metal. The gauge lamps are connected



Lamp for Steam Gauge, Lubricator and Brake and Signal Gauge.

with the overhead leads by armoured wire, which enters the lamp socket through a standard pipe bushing, to which it is well soldered. Crouse-Hinds condulets are used at these points.

The fixtures employed are illustrated herewith, all but the water gauge having wide openings in front, while for the water gauge there is only a vertical slot. In addition to the electric bulb in each, they combine an oil well auxiliary. The lamp socket at the top is of special design, made especially for the C. N. R., but it is claimed that it warrants the additional expense from the fact that it absolutely secures it to the cable.

The headlight has unique features. It has an auxiliary reflector for incandescent lamps, for use in yards and terminals where it would be inadvisable to use the arc lamp. This auxiliary reflector consists of a mirrored surface, 3½ by 10 ins., set at an angle of about 60 degrees from the horizontal, with the incandescent lamp in front, which reflects the light from the auxiliary mirror, into the main parabolic mirror, when the arc is not operating.

The headlight also has a snow plough connection, provided on all locomotives, as it has been found serviceable for many special minor purposes in wrecks, such as lighting clusters of lamps for auxiliary outfits, and making an inspection in the yard after dark.

Checking a Landslide in a Railway Cut.

Checking a landslide in a railway cut by breaking up the slope with massive blocks of concrete built in trenches running up the slope was practised with success on the Ebant & Nesslau Ry. in Switzerland. A sidehill cut had been made through an ancient landslip, the material consisting of clay and loam mixed with boulders and tree trunks, underlaid by a bed of marl. A longitudinal crack, about 200 ft. long, appeared in the slope of the cut, and similar cracks developed in the ground above the edge of the slope, while 33 ft. from this was a main road. A retaining wall was proposed, but it was evident that this would be overturned or carried away before the concrete could set. As an emergency measure, massive concrete blocks were built in the slope, the excavations being carried into the hard material over which the loose mass was sliding, so that the blocks could not move down the slope.

Four blocks, 33 ft. apart, were built, but as the slide continued to squeeze out between them two additional intermediate blocks were built. The slope then stood, but the pressure was so great as to partly raise the blocks, revolving them on their lower ends so that they tended to approach a steeper slope. One block moved outward 32 in. at the top, its foot remaining stationary. The trouble was due to water in the soil, but there was no time to put in any drainage system, and some immediate action was necessary, in view of the main road above the cut, and the possibility of starting a slide of the whole slope of the mountain above the cut.

C.P.R.'s Paris office not closed. — A. Catoni, Agent, C.P.R., Paris, France, has not closed the office there and removed to London, Eng., for the present, as stated in Canadian Railway and Marine World for October, on the authority of a London press dispatch. We are officially advised that the office has not been closed at all, and that, except for a visit of report to London which Mr. Catoni made towards the end of September, he has not been absent from Paris. As stated in Canadian Railway and Marine World for September, the office has been of great service to Canadians, people from the United States and British residents and visitors in France during the war, and as the Dominion Express Co.'s representative Mr. Catoni has been of great service to many who found themselves absolutely without funds.

The practice of assigning a special expert mechanic to laying out all the work to be done in a machine shop, has been found especially advantageous from many standpoints, the principal ones being the dexterity with which he handles the work, the saving in the time of the machines and the centralization of all jigs and templates.

Supplying fans with ball bearings has been suggested as a means of averting trouble from fans throwing oil from flooded bearings, with resulting damage to clothes, carpets, etc.

Many railways have found it desirable to change the driving tires of locomotives for re-turning, instead of dropping the wheels, and turning the tires on the original centres.

Orders by Board of Railway Commissioners for Canada.

Beginning with June, 1904, Canadian Railway and Marine World has published in each issue summaries of orders passed by the Board of Railway Commissioners, so that subscribers who have filed our paper have a continuous record of the Board's proceedings. No other paper has done this.

The dates given of orders, immediately following the numbers, are those on which the hearings took place, and not those on which the orders were issued. In many cases orders are not issued for a considerable time after the dates assigned to them.

22716. Oct. 17.—Approving location of C. P. R. station at Luxor, mileage 54.3 Kootenay Central Branch, B. C.

22717. Oct. 16.—Relieving C. P. R. from speed limitation of 20 miles an hour over its Virden-MacAuley Branch, Man., from mileage 0 to 14.

22718. Oct. 16.—Ordering Canadian Northern Ry. to move commercial spur at Barwick, Ont., 45 ft. closer passing track, and extend same over highway crossing just east of station building to point near turnout of switch, grade at least 14 ft. driveway entire length of commercial track, south side; erect signboards 250 ft. from crossing, showing no cars must be left standing on commercial track outside that point; work to be completed by July 15, 1915.

22719. Oct. 16.—Approving location of Lake Erie and Northern Ry. (C.P.R.) station in Glenmorris, Ont.

22720. Oct. 13.—Approving agreement between Bell Telephone Co. and Sparta Rural Telephone Co. of Sept. 23.

22721. Oct. 16.—Authorizing C. P. R. to open for traffic certain portions of additional track on its Lake Superior Division, Ont.

22722. Oct. 19.—Amending order 22661, Oct. 2, re interlocking plant at crossing of G. T. R. by Ottawa and New York Ry. by substituting Ottawa and New York Ry. for Ontario and Western Ry.

22723. Oct. 17.—Suspending, pending investigation by Board, rates in C. P. R. Tariff, C. R. C. E. 2872 on coal in carloads.

22724. Oct. 19.—Authorizing C. P. R. to construct its Lacombe Easterly Branch across certain highways between mileage 143.61 and 149.15 from Lacombe, Alta.

22725. Oct. 19.—Authorizing Campbellford, Lake Ontario and Western Ry. (C. P. R.) and Oshawa Ry. to operate over crossing at Prospect St., Oshawa, Ont., without first stopping trains and cars.

22726. Oct. 17.—Authorizing C. P. R. to build for Town of Russell, Man., a highway crossing at Augusts St., and close 2 highway crossings; and approving re-location of C. P. R. station there.

22727. Oct. 16.—Authorizing C. P. R. to build across road allowance at mileage 63.7 Bredenbury Subdivision, Man.

22728. Oct. 17.—Authorizing Canadian Northern Ry. to open for traffic portion of railway from Avonlea to Gravelburg, Sask., until July 15, 1915; speed of trains limited to 15 miles an hour.

22729. Oct. 17.—Approving G. T. R. plan showing block signal on westbound main line between Junction Cut and Dundas, Ont., as required by order 22672, Oct. 6.

22730. Oct. 19.—Approving location of Glengarry and Stormont Ry. (C.P.R.) stations and grounds at Bridge End, mileage 5.28, and Glen Gordon, mileage 12.78, Lancaster Tp., Ont.

22731. Oct. 20.—Authorizing Canadian Northern Ry. to build a spur for Alberta Block Coal Co., through south half Sec. 10 and north half Sec. 3-29-20, w.4.m., Alta.

22732. Oct. 19.—Declaring that Niagara, St. Catharines and Toronto Ry. Co. is senior to Erie and Ontario Ry. for all tracks when build at crossing in Lot 32, Con. 5, Gainsboro Tp., Ont.

22733, 22734. Oct. 20, 21.—Approving location of G. T. Pacific Ry. stations at Burns Lake, mileage 316.8, and at Savory, mileage 345.5 Prince Rupert East, B. C.

22735. Oct. 20.—Approving change in location of G. T. R. siding for Lord and Burnham Co., St. Catharines, Ont.

22736. Oct. 20.—Relieving C. P. R. from speed restriction of 10 miles an hour on trains over crossing of Nipissing St., Sturgeon Falls, Ont.

22737, 22738. Oct. 20, 21.—Authorizing C. P. R. to build spurs for Moose Jaw Sand and Gravel Co., Moose Jaw, Sask., and for Empire Water Works Supply Co. of Canada, Winnipeg.

22739. Oct. 20.—Authorizing Canadian Northern Ry. to open for traffic its North Battleford northwesterly line from Edam, to Turtleford, mileage 36 to 57, speed of trains limited to 15 miles an hour.

22740. Oct. 20.—Authorizing Canadian Northern Ry. to build spur for Rosedeer Coal Co., Rosedeer, Alta.

22741. Oct. 21.—Authorizing Fertile Valley rural municipality no. 285, Sask., to build highway crossing over Canadian Northern Ry. on surveyed road north of Sec. 3, Tp. 29, R. 29, w. 3.m., Sask.

22742. Oct. 22.—Dismissing application of Town of Pointe-aux-Trembles, Que., for order to open up Fifth and Sixth Aves. across Canadian Northern Ry.

22743. Oct. 23.—Authorizing C. P. R. to build bridge 43.1, Lachine Canal swing span, Farnham subdivision, near Highlands, Que.

22744. Oct. 23.—Approving G. T. Pacific Ry. application for approval of locations of certain stations in Cariboo District, B. C.

22745. Oct. 24.—Ordering Michigan Central Rd. and G. T. R. to publish tariff of joint rate of 50c a ton, on sand from St. David's Sand Co., St. Catharines, Ont., to Merritton; rate to be effective not later than Nov. 9, cars to be loaded to full carrying capacity, subject to minimum weight of 60,000 lbs.

22746. Oct. 23.—Extending to Dec. 13, time within which C. P. R. shall complete subway between Lots 5 and 6, Con. 5, Toronto Tp., Ont.

22747. Oct. 24.—Authorizing Imperial Bank to pay Canadian Northern Ry. $400, deposited to Board's credit, with accrued interest.

22748. Oct. 21.—Extending for 30 days from date time within which G. T. R. shall complete cattle pass on H. Lewis's farm, near Burford, Ont.

22749. Oct. 20.—Authorizing Campbellford, Lake Ontario and Western Ry. (C.P.R.) to divert forced road in n. ½ Lot 11, Con. 7, Richmond Tp., to carry same across railway at right angles, at mileage 55.87; and authorizing it to take lands forming part of Lot 11, Con. 7, and rescinding order 19481, May 30, 1913.

22750. Oct. 22.—Amending order 22699, Oct. 9, re C. P. R. crossing of McLennan Ave., North Toronto, Ont.

22751. Oct. 23.—Dismissing applications to open up Mercier Ave., Lebrun, Azilda, De Rochebleave, and Confrecoeur Sts., across C. N. Quebec Ry.; and authorizing the opening up of Baldwin, Des Ormeaux and Hector Sts., Montreal.

22752. Oct. 23.—Authorizing Van Buren Bridge Co. to build temporary crossing over C. P. R. near St. Leonards, N. B.

22753. Oct. 23.—Authorizing C. P. R. to connect with Oshawa Ry. near Oshawa, Ont.

22754. Oct. 26.—Authorizing Canadian Northern Ontario Ry. to open for traffic its line from mileage 273.97 from Toronto, to Capreol Jct., 3.03 miles.

22755. Oct. 24.—Authorizing Saskatchewan Highway Commissioners to build highway crossing over Canadian Northern Ry. Goose Lake Branch, at east end of station grounds at Netherhill, Sask.

22756. Oct. 24.—Relieving G. T. R. from speed limitation of 10 miles an hour over crossing of highway at Strathmore, Que.

22757. Oct. 26.—Authorizing Glengarry and Stormont Ry. (C.P.R.) to connect with Ontario and Quebec Ry. (C.P.R.) 700 ft. east of mileage 37, being mileage 0, Glengarry and Stormont Ry.

22758. Oct. 24.—Approving revised location Kootenay Central Ry. (C.P.R.) from Lot 288, mileage 96.16, to n.w. ¼ Lot 353, mileage 109.41, East Kootenay District, B.C.

22759. Oct. 26.—Approving revised location portion of C.P.R. Thompson Subdivision, mileage 30 to 33, B.C.; and authorizing it to build additional track, at grade, across two highways.

22760. Oct. 26.—Ordering that crossing of Kingston Road by Canadian Northern Ontario Ry., in Lot 33, Con. 1, Sidney Tp., be protected by gates operated by day and night watchmen; cost to be paid half each by C. N. O. R. and Campbellford, Lake Ontario and Western Ry. (C.P.R.); pending installation, all train movements to be flagged over crossing.

22761. Oct. 27.—Extending to Dec. 31, 1915, time within which Canadian Northern Ontario Ry. shall complete transfer track with G.T.R. in Port Hope, Ont.

22762. Oct. 23.—Authorizing G. T. Pacific Branch Lines Co. to take additional lands required for station grounds in n.w. ¼, Sec. 4-17-26, w. 2 m., Moosejaw District, Sask.

22763. Oct. 26.—Extending to Dec. 31 time within which G.T.R. shall complete subway at crossing of Thompson Road, Bertie Tp., Ont.

22764. Oct. 23.—Dismissing application of Town of Victoriaville, Que., for extension of Albert St. across G.T.R.

22765. Oct. 26.—Authorizing C.P.R. to use bridges 98.1, 119.2, 94.0.

22766. Oct. 16.—Authorizing C.P.R. to build bridge 20.42 over Pays Plat River, near Pays Plat, Nipigon Subdivision, Ont.

22767. Oct. 27.—Approving locations of G. T. Pacific Ry. stations at mileage 1225.7, 1248.5, 1212.5, 1255.4, 1208.2, 1269.6, Cariboo District, B.C.

22768. Oct. 23.—Authorizing G. T. Pacific Ry. to build spur for N. M. Paterson & Co., Fort William, Ont.

22769. Oct. 27.—Approving locations of eight G. T. Pacific Ry. stations in British Columbia.

22770. Oct. 27.—Relieving C. N. Ontario Ry. from speed restriction between Perth Road Pit and Chaffey's Locks, Toronto-Ottawa Line, with exception of portion between mileage 174 and 175.25, and 181 to 181.25 from Toronto, where speed shall be limited to 15 miles an hour.

22771. Oct. 26.—Approving location of Glengarry and Stormont Ry. (C.P.R.) station and yard in Cornwall, Ont.

22772. Oct. 27.—Authorizing City of Vancouver, B.C., to build highway over C.P.R., by bridge, from the easterly end of Dunsmuir St to junction with Georgia-Harris St. bridge, now under construction; cost to be paid by the city.

22773. Oct. 6.—Approving plan S.D.-233 showing signal protection to be installed by G.T.R. between Richmond St. and St. Henri Station, Montreal.

22774. Oct. 27.—Approving G.T.R. clearances, etc., over sidings of Canada Forge Co., Welland, Ont.

22775. Oct. 28.—Approving G.T.R. location and details of its new station at Waterville, Que.

22776. Oct. 28.—Authorizing C.P.R. to build siding for Wayagamack Pulp and Paper Co., Three Rivers, Que.

22777. Oct. 27.—Approving agreement between Bell Telephone Co. and South Ham Telephone Co.

22778. Oct. 28.—Approving C.P.R. re-location of station at Eganville, Ont.

22779. Oct. 28.—Approving, until further ordered by Board, Esquimalt and Nanaimo Ry. Standard Freight Mileage Tariff, C.R.C. 268.

22780. Oct. 29.—Authorizing G.T. Pacific Ry. to enter T. Gowan's lands, Ingelow, Man., for building fire guard.

22781. Oct. 28.—Authorizing Kettle Valley Ry. to build across highway near station 108+10, west of Penticton, B.C.

22782. Oct. 29.—Authorizing Erie and Ontario Ry. to operate, temporarily, for construction purposes only, over G.T.R. crossing at Dunnville, Ont., between 7 a.m. and 6 p.m.; all trains to stop before crossing and to be flagged over.

22783. Oct. 29.—Extending, to May 1, 1915, time within which Toronto, Hamilton and Buffalo Ry. shall complete branch line for Dominion Power and Transmission Co., as authorized by order 21558, March 26, and amended by order 21591, Apr. 4.

22784. Oct. 30.—Ordering G. T. Pacific Ry. to build a 10-car spur at Old St. Louis, Sask., with trailing point switch toward bridge over South Saskatchewan River; to be completed within 30 days from date.

22785. Oct. 29.—Ordering C.P.R. to install, within 60 days, an improved type of automatic bell at crossing of highway between Lots 5 and 6, Toronto Tp., at mileage 12.61; 20% of cost to be paid by railway grade crossing fund.

22786. Oct. 28.—Authorizing C.P.R. to build two spurs for J. Ayhram, Montreal.

22787. Oct. 28.—Approving, until Dec. 31, clearances between G.T.R. and telegraph poles carrying Great North Western Telegraph Co.'s wires and railway wires, between Guy St. and St. Henri station, Montreal.

22788. Oct. 28.—Authorizing G.T.R. to build siding for Library Bureau of Canada, south of Isabella St., Ottawa.

22789. Oct. 30.—Authorizing G. T. Pacific Ry. to enter lands of H. Siehel, west ½ Sec. 25-18-19, w. 2 m., Sask., for building a fireguard.

22790. Oct. 29.—Relieving G.T.R. from speed limitation of 10 miles an hour over crossing of second public highway, near Neustadt, Ont.

22791. Oct. 29.—Authorizing Kettle Valley Ry. to build across 7 highways in British Columbia, subject to inspection by B.C. Department of Public Works.

22792. Oct. 29.—Ordering G.T.R. to flag all switching movements over crossing of Wentworth St., Hamilton, Ont.

22793. Oct. 30.—Authorizing C.P.R. to relocate existing spur and extension for I. Desormeau, in Lot 313, Cote St. Francis, Que.

22794. Oct. 30.—Extending, to Nov. 30, time within which C.P.R. shall install gates at St. Thomas and Bonaventure Sts., Three Rivers, Que.

22795. Oct. 28.—Authorizing C.P.R. to build siding for H. de Chires, in Lot 136, St. Martin concession, St. Felix de Valois Parish, Que.

22796. Oct. 30.—Authorizing Guelph Radial Ry. to connect interchange track with G.T.R. on Suffolk St., Guelph, Ont.

22797. Oct. 31.—Authorizing C. N. Ontario Ry. to open for freight traffic portion of its line from Cassells St., North Bay, to Capreol.

22798. Oct. 31.—Approving, until further ordered, Great Northern Ry. Standard Freight Mileage Tariff, C.R.C. no. V-36, on Victoria and Sidney Ry.

22799. Nov. 2.—Amending order 22520, Sept. 9, re installation of automatic bell by G.T.R. at crossing one mile west of Peterborough, Ont.

22800. Oct. 31.—Authorizing Algoma Central and Hudson Bay Ry. to build overhead bridge for street railway and highway across its tracks between Catheart St. and Wilde Ave., Tagona, Ont.; and rescinding order 16778, June 11, 1912.

22801. Oct. 31.—Authorizing Edmonton, Dunvegan and British Columbia Ry. and Canadian Northern Ry. to operate over crossing in Sec. 33-55-25, w. 4 m., south of Morinville, Alta., without first stopping trains.

22802. Nov. 3.—Establishing collection and delivery limits of Dominion Ex. Co. in Kentville, N.S.

22803. Nov. 2.—Authorizing Erie and Ontario Ry. to operate construction trains, temporarily, between 7 a.m. and 6 p.m. over crossing of Michigan Central Rd. near Attercliffe, Ont.

22804. Nov. 2.—Dismissing application of City of Calgary, Alta., for order directing C.P.R. to pay cost of building pavement at subway at Ninth Ave.

22805. Nov. 2.—Authorizing Lake Erie and Northern Ry. to build bridge across mill pond, mileage 0.13, Galt, Ont.

22806. Nov. 3.—Approving location and details of Erie and Ontario Ry. station, Dunnville, Ont.

22807. Nov. 2.—Authorizing C.P.R. to build extension to siding for Toronto Carpet Manufacturing Co. at Parkdale, Ont.

22808. Nov. 3.—Dismissing application of cities of Vancouver and North Vancouver, B.C., against change of plans of North Vancouver Ferry pedestrian subway by C.P.R.; and applying for order directing C.P.R. to pay cost of such alteration.

22809. Nov. 2.—Authorizing Canadian Northern Ry. to build spur for Star Coal Mines, Ltd., in ½ Sec. 28-28-19, w. 4 m., Alta., and certifying correction showing C.N.R. as owner of right of way from station 2+40 to 28+12, instead of C.P.R.

22810. Nov. 4.—Ordering that stations to be erected by G.T. Pacific Ry. at Foreman and Aleza Lake, B.C., approved by order 22744, Oct. 23, be according to G.T.P.R. standard structural plan 1.

22811. Nov. 4.—Approving C.P.R. plan 44108, March 31, 1913, showing standard reinforced concrete trestle for double track.

22812. Nov. 3.—Authorizing C.P.R. to rebuild bridge 41.2 at Shields, B.C.

22813. Nov. 4.—Authorizing C.P.R. to use bridges 37.9 and 88.6, Toronto Subdivision, and 61.51, 81.5 and 25.94, Woodstock and Tobique Subdivisions, N.B.

22814. Nov. 3.—Authorizing C.P.R. to open for traffic certain portions of its second track on Cartier, Chapleau and Nipigon Subdivisions, Lake Superior Division, Ont.

22815. Nov 3.—Approving C.P.R. clearances at crossing of pipe and wooden conveyor across siding into Melcher's distillery, mileage 1.79, Berthier Subdivision, Que.

22816. Nov. 4.—Authorizing C.P.R. to open for traffic its line from Gimli to Riverton, Man., mileage 0 to 26.

22817. Nov. 4.—Ordering Esquimalt and Nanaimo Ry. to install gates at crossing of Victoria and Campbell River trunk road, south of Duncan Station, B.C.; gates to be operated by day and night watchmen; cost of building, maintaining and operating to be paid, half by City of Duncan, B.C., and half by E. & N. Ry.

22818. Oct. 30.—Authorizing G.T.R. to build siding for Ford Motor Co. of Canada, Sandwich East Tp., Ont., and rearrange tracks.

22819. Nov. 4.—Ordering that transfer track for interchange of traffic between G.T.R. and C.P.R. at Listowel, Ont., be built near Reserve St.; work to be done by C.P.R., Town of Listowel to pay one third cost of installing, balance divided equally between the two companies.

22820. Nov. 2.—Authorizing Kettle Valley Ry. to carry traffic over its line from Hydraulic Summit to Penticton, mileage 75.6 to 133.7 west of Midway, speed of trains limited to 10 miles an hour within town limits.

22821. Nov. 2.—Approving Bell Telephone Co. agreement with Chapeau Rural Telephone Co., Sept. 11.

22822. Nov. 5.—Relieving C.P.R. from speed limitation of 10 miles an hour over crossing at mileage 175, Kenora Subdivision, Ont.

22823. Nov. 5.—Approving location and layout of Lake Erie and Northern Ry. station at Paris, Ont.

22824. Nov. 4.—Authorizing G.T. Pacific Ry. to build its Lake Superior Branch across Fort William Electric Ry., on Empire Ave., at Sprague St., installation and operation of half-interlocking plant to be paid by G.T.P.R.

22825. Nov. 5.—Approving revised location of C.P.R. Swift Current Northwesterly Branch, from mileage 111.95 to 122.58, Sask.

22826. Nov. 4.—Authorizing Sudbury-Copper Cliff Suburban Electric Ry. to build across C. P. R. at Elm St., Sudbury, Ont., to cross Y on Elm St., immediately south of main line; to cross spur to Sudbury Construction and Machine Co., and Sudbury Brewing Co. on Lorne St.; and to cross C.P.R. Stobie Branch north of main line crossing Elm St.; and apportioning cost of protection to be provided.

22827. Nov. 4.—Authorizing G.T. Pacific Branch Lines Co. to enter lands of N. Smith, Stoney Beach, Sask., between mileage 26.1 and 26.3, for building fireguard.

22828. Nov. 6.—Authorizing G.T. Pacific Branch Lines Co. to build across 25 highways on its Yorkton Branch, Sask., between mileage 0.5 and 23.6.

22829. Nov. 6.—Authorizing G.T.R. to build extension to siding for P. Del Sole, Lot 105, St. Bruno Parish, Que.

22830. Nov. 6.—Authorizing C.P.R. to build double track at grade across road allowance between Secs. 29 and 30-17-5, w. 3 m., mileage 54.36, from Moose Jaw, Sask.

22831. Nov. 6.—Authorizing C.P.R. to build spur for Yahk Lumber Co., Cranbrook, B.C., from Kootenay Central Ry., mileage 36.1 from Colvalli, at Wasa.

22832. Sept. 21.—Authorizing C.P.R. to build double track and road diversion between Secs. 22 and 23-18-13, w. 2 m., at mileage 51.41 from Broadview, Sask.

22833. Nov. 6.—Approving location of Lake Erie and Northern Ry. station at Galt, Ont. Ont.

22834. Nov. 7.—Establishing collection and delivery limits of Dominion Ex. Co. in Red Deer, Alta.

22835. Nov. 7.—Authorizing C.P.R. to build spurs for T. D. Robinson & Sons, and Dominion Lumber and Fuel Co., Winnipeg, and authorizing Winnipeg Electric Ry. to build across first named spur on Selkirk Ave. W. E. Ry. to pay cost of operating and maintaining protective appliances; C.P.R. to pay cost of building diamond and extra cost of extending interlocking plant; and rescinding order 21287, Jan. 29.

22836, 22837. Nov. 9, 7.—Ordering that stations to be built by G.T. Pacific Ry. at Savory, Burns Lake, Dewey, Newlands, Longworth, Giscome, Lindup, and Shelley, B.C., be in accordance with G.T.P.R. standard structural plan 1.

22838. Nov. 9.—Authorizing Erie and Ontario Ry. to build, at grade, across Broad St. East, Dunneville, Ont..

22839. Nov. 10.—Authorizing Town of Whitewood, Sask., to close Balfour St., and open up Lalonde St. across C.P.R.

22840. Nov. 5.—Authorizing Alberta Public Works Department to build highway over C.P.R. east of Sec. 7-8-4, w. 5 m. and close old crossing.

22841. Nov. 10.—Authorizing C.P.R. to build spur for McCormick Manufacturing Co., London Tp., Ont.

22842. Nov. 10.—Authorizing C.N. Ontario Ry. to build across and divert highway at mileage 255.4, Field Tp., Nipissing District.

22843. Nov. 10.—Ordering that City of Fort William, Ont., and owners of industries served by spur authorized by orders 17869 and 18908, Oct. 24, 1912, and Mar. 20, 1913, pay pro rata to C.P.R. $2,103.91 additional; C.P.R. to refund to them half tolls charged by it for traffic over said spur, until said amount has been repaid to industry owners.

22844. Nov. 9.—Amending order 22559, Sept. 17, re St. John and Quebec Ry. crossing of C.P.R. spur at Fredericton, N.B.

22845. Nov. 7.—Ordering Dominion Atlantic Ry. to build farm crossing for Mrs. A. E. Copeland, Deep Brook, N.S., at her expense.

22846. Nov. 11.—Authorizing Brantford Municipal Ry. Commission to rebuild bridge carrying Grand Valley Ry. across G.T.R., near Blue Lake, Ont., applicant to raise bridge to its original height should G.T.R. decide to raise its grade at the bridge.

22847. Nov. 10.—Authorizing G.T. Pacific Ry. to divert road in n. e. ¼ Sec. 8 and s. e. ¼ Sec. 17-44-5, w. 4 m., Alta.

22848. Nov. 9.—Amending order 22672, Oct. 6, re G.T.R. spur connecting with westbound main track in West Flamboro Tp., Ont.

22849. Nov. 9.—Authorizing Van Buren Bridge Co. to build across C.P.R., Edmundston Branch, near St. Leonard, N.B., applicant to provide interlocking plant.

22850 Nov. 10.—Authorizing G.T. Pacific Ry. amended location of spur in Sec. 7-53-23, w. 4 m., Alta.; and rescinding order 17827, Sept. 24, 1912, in same connection.

22851. Nov. 11.—Suspending order 22211, July 14, re railway crossing on Spruce Ave., Edmonton, Alta.

22852. Nov. 10.—Authorizing Erie and Northern Ry. for construction purposes only for three months to operate over crossing, near Diltz, Ont., of G.T.R. and Wabash Rd., E. & O. Ry. to give G.T.R. 12 hours advance notice when it desires to use crossing, so G.T.R. may appoint a watchman, at E. & O. R.'s expense, to protect train movements.

22853. Nov. 9.—Authorizing City of London, Ont., to build highway crossing over G.T.R. at Ashland Ave.

22854. Nov. 9.—Extending to June, 1915, time within which St. John Ry. shall instal half interlocking plant required by order 21914, June 1., 1914, at crossing of C.P.R. on Main St., St. John, N.B.

22855. Nov. 12.—Apportioning cost of grade separation at North Toronto, exclusive of Yonge St., as follows:—10% of separation of grades at Avenue Rd. to be paid by Toronto Ry.; 20% of cost of subways at Davenport and Spadina Roads, and Howland Ave., not exceeding $5,000 in any one case, to be paid out of railway grade crossing fund; after deducting contributions from these two services, 25% of remainder to be paid by City of Toronto; city's contribution to be for all highways at which grade separation is effected, except Yonge St., from east of Summerhill Ave. to where grade runs out west of Dovercourt Road; balance of cost to be paid by C.P.R.

22856. Nov. 12.—Authorizing C.P.R. to operate bridges 11.9, 7.6, and 66.6, Brandon, Emerson and Souris Subdivisions, Man.

22857. Nov. 12.—Approving location of G.T. Pacific Ry. stations, at Rose Lake, Forestdale, Decker Lake, Walcott, Quick and Priestly, B.C.

22858. Nov. 12.—Authorizing Maine Central Rd. to build branch in Clifton Tp., Que.

22859. Nov. 12.—Approving location of G.T. Pacific Ry. station at Palling, B.C.

22860. Nov. 10.—Approving agreement between Bell Telephone Co. and Thessalon Tp., Ont., Oct. 20.

22861. Nov. 12.—Ordering that application for recommendation to Governor in Council for sanction of amalgamation agreement between Toronto, Hamilton and Buffalo Ry. and Erie and Ontario Ry. be made to the Board on Dec. 15.

22862. Nov. 11.—Authorizing G.T.R. to build siding, from Lot 23, Con. 7, Crowland Tp., Ont., connecting with Michigan Central Rd. siding south of Dover St., Welland.

22863. Nov. 13.—Approving clearances between south track of C.P.R., Island St. team yard, Montreal, and fence alongside.

Canadian Northern Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, increases, or decreases, compared with those for 1913-14, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$1,594,300	$1,163,800	$430,500	x $83,800
Aug.	1,367,700	1,123,000	244,700	x 163,900
Sept.	2,109,600	1,519, 00	590,700	65,800
Oct.	1,895,300	1,332,100	563,200	x440,900
	$6,967,200	$5,138,100	$1,829,100	x$622,800
Decr.	$1,468,400	$ 845,600	$ 622,800	.....

x Decrease.

The mileage under operation during the above periods was 4,670 in 1914, against 4,432 in the previous year.

Canadian Pacific Railway, Earnings, Etc.

Gross earnings, working expenses, net earnings, increases or decreases, compared with those of 1913-14, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$10,481,971.72	$6,703,525.89	$3,778,445.83	x$328,347.35
Aug	8,917,764.38	6,554,606.68	3,373,157.70	x 597,981.54
Sept.	10,754,139.67	6,387,091.28	4,367,048.39	x 48,530.30
	$31,153,875.77	$19,645,223.85	$11,508,651.92	x$984,859.19
Dec.	$ 4,430,728.55	$ 3,445,869 36	$ 984,859.19	.....

x Decrease.

Approximate earnings for October, $9,152,000, against $14,357,000 for Oct., 1913.

Grand Trunk Railway Earnings, Etc.

Gross earnings, working expenses, net earnings, etc., compared with those for 1913, from July 1, 1914:—

	Gross Earnings	Expenses	Net Earnings	Increase or Decrease
July	$4,724,000	$3,668,200	$1,055,800	.....
Aug.	4,853,600	3,564,100	1,259,500	x$61,800
	$9,577,600	$7,232,300	$2,345,300	.....

x Decrease.

Approximate earnings for September, $4,671,559, and for October, $4,407,438, against $4,870,641 for Sept., and $5,051,101 for Oct., 1913.

Mileage under operation at Oct. 31, 4,533, as at Oct. 31, 1913.

Grand Trunk Pacific Railway Earnings.

The approximate earnings of the Prairie Section and Lake Superior Branch, 1,104 miles, for October were $605,560, against $994,303 for Sept., 1913. Aggregate earnings for four months ended Oct. 31, $2,224,757, against $2,732,674 for the same period 1913.

A wireless telephone system is being installed by the Union Pacific Rd. for communication with its overland trains. There will be stations at Grand Island and North Platte, Neb., Cheyenne and Green River, Wyo., and Ogden, Utah. High towers and heavy sending equipment (5 and 10 kw.) will be used to overcome communication difficulties in the Rocky Mountains.

Blue Flag Holder, Canadian Pacific Railway.

The Canadian Pacific Car Department is using a blue flag holder that appears to meet all requirements. The accompanying illustrations show the appearance and general construction. The sizes of materials used are as follows:—Spring clamp for gripping rail head (fig. 4) is made of one piece of ⅝ in. half round. The foot piece used for forcing the clamp over the rail is 1½ by ⅛ in by 4½ ins. The mast is made of 1¼ in. o.d. seamless tubing 1-16 in. thick, 32 ins. long. This is cylindrical for 9 ins. from the lower end, and above this point one side is pressed in so that the cross section is crescent shape, thus forming a recess that permits the flag, when wrapped around the cross bar, to be folded so that it is very compact and convenient to carry. The flag is secured to the cross bar by means of a light strip of metal and 4 small stove bolts, and the lower edge of the flag is weighted with a piece of steel bar, thus ensuring the full area always being in view, regardless of wind conditions. This is an important feature, as the ordinary flag attached to a perpendicular mast hangs limp when the wind is not blowing, and if attached to a stick that is horizontal the flag may not be very conspicuous if the wind is blowing strongly from the observer's direction.

At night it is equally as useful as in the day time, the only change required being to wrap the flag around the cross bar and hang a lantern over the bar (fig. 3), the folds of the flag serving to prevent lantern from creeping off.

One of the most important advantages of this arrangement is the fact that it makes possible the enforcement of rules requiring that the flag be located a specified distance away from the car that it is protecting This is important, as flags displayed against a dark object, like a car painted black, are not conspicuous as they would be if placed some distance in front of same.

The Board of Railway Commissioners' circular respecting the use of flags for protection of car repairers was published in Canadian Railway and Marine World for May, 1913, and the blue flag stand used at the Canadian Northern Ry. Winnipeg shops was described in the Dec., 1913, issue, pg. 559.

Fig. 1.—Blue Flag on Rail in Front of Passenger Car. (Car not undergoing Repairs.)

Cartridge case manufacture at Angus Shops.—We are officially advised that the report in a Toronto financial paper that the C.P.R. had received a large order to make brass cartridge shells at its Angus shops, Montreal, is incorrect, and that no such order has been placed.

Canaidan Steel Foundries Ltd.—M. E. Duncan, Vice President Canadian Car and Foundry Co., has been elected a director of Canadian Steel Foundries, Ltd., one of the Canadian Ca rand Foundry Co.'s subsidiaries, succeeding the late J. R. Wilson.

Railway Mileage in Alberta.

The Department of Railways for Alberta issued a statement regarding railway building in the province, Nov. 14, in which it was stated that at the end of the year there will be a total of 4,250 miles of railway in operation in the province, as against 2,100 in 1911. Of this mileage 950.10 miles have been or will be put in operation during this year. Most of this mileage has been built this year, but it is uncertain whether it will all be in operation by Dec. 31. The mileage built by the several companies is as follows:—

	Miles	Miles
Alberta and Great Waterways Ry.		
To North Lac La Biche		140.0
Central Canada Ry.		
McLennan to 20 miles from Peace River		30.0
Canadian Northern Ry.		
Edmonton-Onoway, Onoway-Pembina	63.0	
Edmonton-Camrose	47.0	
Warden Jct.-Nordegg	178.0	
		288.0
Canadian Pacific Ry.		
Coronation towards Sedgewick	25.0	
Red Deer to Rocky Mountain House	64.5	
Mountain to bonndary	32.0	
Stirling easterly from Foremost	25.7	
Suffield branch extension	26.6	
Gleichen to Shepard	40.8	
Empress to Bassano	118.5	
		333.1
Edmonton, Dunvegan & B.C. Ry.		
Smith to Big Smoky River		159.0
Total		950.1

New Books, Etc.

Any of the books mentioned may be obtained through Canadian Railway and Marine World at the published price.

THE CONVENTIONAL SIGNS FOR USE ON RAILWAY profiles, right of way and track maps and structural plans; 27 pgs., 6 by 9 ins., paper. American Railway Engineering Association, 900 South Michigan Ave., Chicago, Ill. Single copies, 25c.; 10 to 25 copies, 20c. each; 25 to 100 copies, 15c. each.

These are the standard symbols recommended by the association for use on maps, profiles, etc., and they have been adopted by the Interstate Commerce Commission in its specifications for maps and profiles.

AMERICAN RAILWAY ENGINEERING ASSOCIATION BULLETIN, no. 170—188 pgs., 6 by 9 ins., paper. American Railway Engineering Association, 900 South Michigan Ave., Chicago, Ill.

This bulletin contains the report of committee on rail, including influence of carbon on the properties of rails, formula for deflection of rails in drop test, study of a rail with internal fissures, rail failure statistics for 1913, by M. H. Wickhorst, Engineer of Tests, Rail Committee; also comparative service tests of 100 lb. sections P.S. and A. R.A.A. on the Pennsylvania lines west of Pittsburg, by W. C. Cushing, Chief Engineer, Maintenance of Way, Southwest System.

C.P.R. Home Guard.—A C.P.R. company of the Montreal home guard is to be formed, to consist of about 250 men, the arms and equipment to be supplied by the railway company. Half of the company will be enrolled from the offices and employes at Angus shops and the other half from the Windsor and Place Viger stations. All departments of the service will be embraced in the composition of this company. At a later date miniature rifle ranges will be established at Angus and Windsor station, where members of the company will be afforded an opportunity to practise marksmanship.

Rogers Pass Tunnel, Canadian Pacific Railway.

The accompanying diagram shows the progress made on the Rogers Pass tunnel, in the Selkirk Mountains, up to Oct. 9, 1914. The tunnel, of which a full description appeared in Canadian Railway and Marine World for June, 1914, will be five miles long, and will pass under Mount Macdonald, practically paralleling the present line. The summit elevation of the new line will be 539 feet lower than on the present line; and, while the maximum gradient of 2.2 per cent. will still be maintained, the length of it will be reduced from 22.15 miles to 6.61 miles. A new survey, for a considerable distance either side of the tunnel, was necessary, the line diverging from points 23 miles apart on the old line. The new line will be five miles shorter.

We are officially advised that on Oct. 31, at the east end of the tunnel there were 5,114 feet of pioneer tunnel driven, but as the pioneer tunnel portal is 740 feet west of the main tunnel portal, it was then 5,854 feet in from the main tunnel portal. The timbering through the soft ground, 1,218 feet, had been completed, and the steam shovel, worked by compressed air, had progressed 751 feet, leaving 467 feet before reaching rock.

At the west end the pioneer tunnel was in 2,285 feet, but as the pioneer tunnel portal is 807 feet east of the main tunnel portal, it was in 3,092 feet from the main tunnel portal. All the sills and plumb posts were in, and also 28 feet of completed timbering, leaving 334 feet of segment to be placed on the plumb posts and wall plates before reaching the point of excavation in the solid rock section. There was 1,375 feet of main heading completed at the west end.

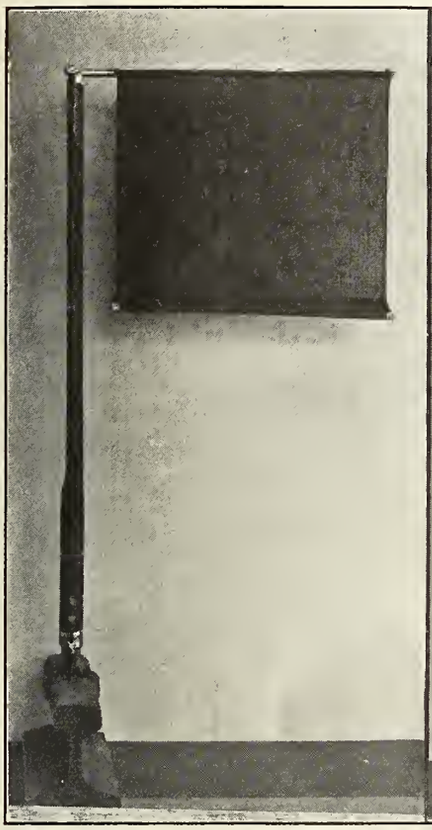
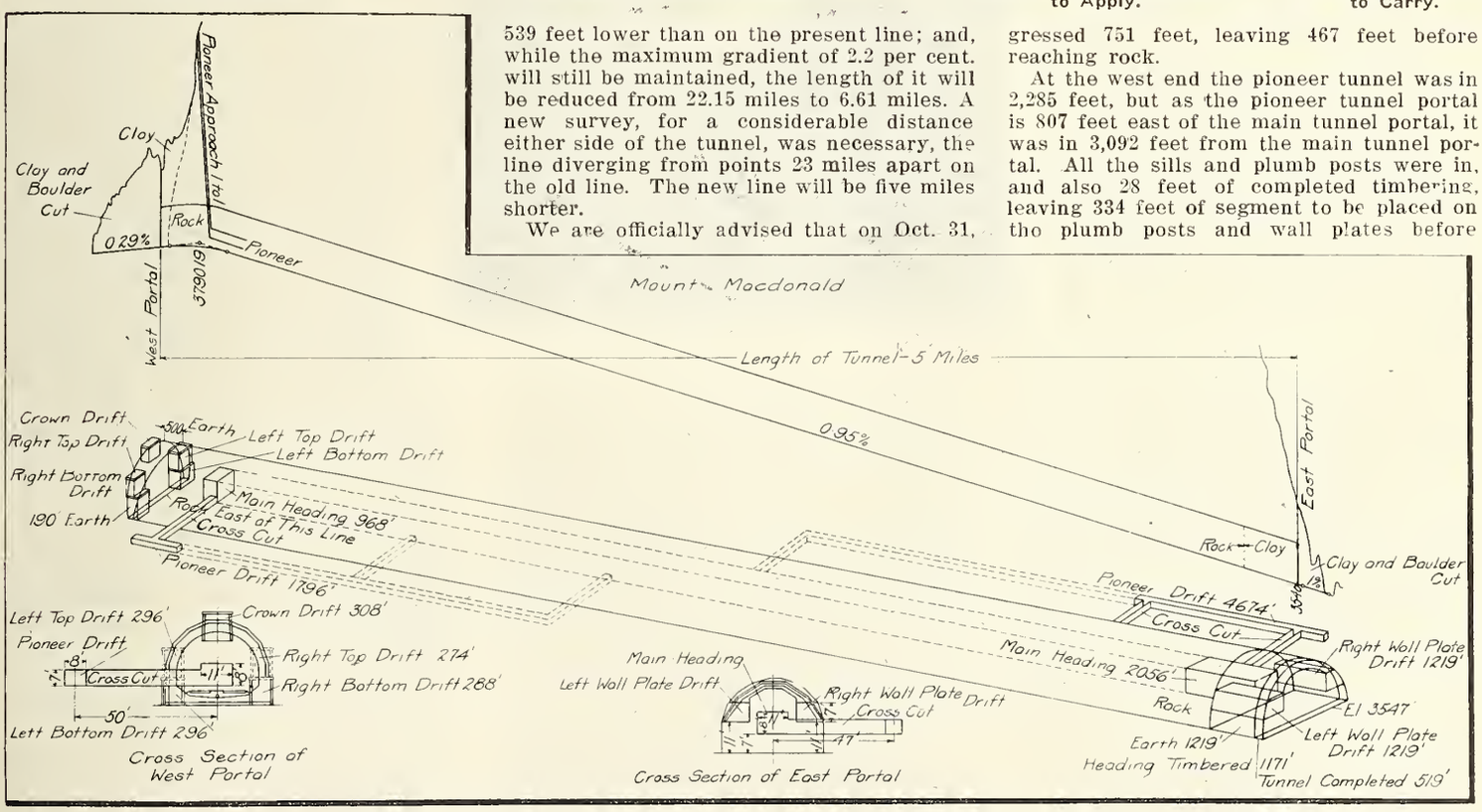


Fig. 2.—Arrangement of Blue Flag in Daytime.

Fig. 3.—Arrangement of Flag with Blue Lantern at Night.

Fig. 4.—Spring Clamp Withdrawn from Mast Ready to Apply.

Fig. 5. — Flag Folded Ready to Carry.



Rogers Pass Tunnel, Canadian Pacific Railway. Progress Diagram, Oct. 9, 1914.

George Bury's Promotion on the Canadian Pacific Railway.

George Bury, now Vice President, C.P.R., in charge of the company's Interests from Port Arthur, Ont., to Vancouver Island, will, on Jan. 1, succeed the senior Vice President, D. McNicoll, at Montreal. The President, Sir Thos. G. Shaughnessy, made the official announcement, Nov. 19, as follows:—

"David McNicoll, Vice President of the C.P.R. Co., who has been connected with the company and one of its acquired lines, the Toronto Grey and Bruce Ry., for upward of 40 years, has signified his desire to be relieved from the very arduous duties of the position he has so long held, for such a long period of rest and recuperation as his present condition of health makes desirable, and he has, therefore, resigned, to take effect Jan. 1 next. He will remain on the board of directors, and, when his health permits, it is expected that he will be asked to accept another important post in connection with the company's affairs. He retires with the esteem, and indeed, affection of the directors, officials, and employes of the company. Vice President George Bury, now in charge of the company's interests west of Lake Superior, will be Mr. McNicoll's successor."

Mr. Bury's Career.

He was born at Montreal, Mar. 6, 1866, and entered C.P.R. service on 1883, since when he has been, to 1887, clerk in Purchasing Department, and in General Manager's office; 1887 to 1889, secretary to Vice President, and afterwards to President; 1889 to March, 1890, acting Superintendent, Sleeping, Dining and Parlor Car Service; March, 1890, to Sept., 1899, successively, Assistant Superintendent, Chalk River, Ont., and superintendent, North Bay, Ont.; Sept., 1899, to Feb., 1901, Superintendent, Fort William, Ont.; Feb., 1901, to Feb., 1902, Superintendent, Crows Nest Pass Line, Cranbrook, B.C.; Feb. to May, 1902, Assistant General Superintendent, Lake Superior Division, North Bay, Ont.; 1905 to Feb., 1907, General Superintendent, Central Division, Winnipeg; Feb., 1907, to Mar. 1, 1908, Assistant General Manager, Western Lines, Winnipeg; Mar. 1, 1908, to Oct., 1911, General Manager, Western Lines, Winnipeg; Oct., 1911, to Dec., 1913, Vice President and General Manager, Western Lines, Winnipeg; Dec., 1912, to Dec., 1914, Vice President in charge of Western Lines, Winnipeg.

P179 George Bury.

Western Appreciation of Mr. Bury.

The Winnipeg Free Press, the leading paper in the vast territory between Lake Superior and the Pacific Coast, over which Mr. Bury's present jurisdiction extends, says: "The West will note with lively interest and much satisfaction the promotion of George Bury, for the past three years Vice President for the C.P.R. Western Lines, to the position of Vice President and General Manager of the whole system. For the people of the west regard Mr. Bury as one of themselves; and, admirably administered as the C.P.R. is, it will certainly not suffer by having as its chief executive officer, under the President, one who has an intimate knowledge of conditions in the west and has shown himself sympathetic towards the special problems with which this half of the Dominion has to deal. Mr. Bury has won this high position on his merits. He has climbed the ladder rung by rung. Beginning as a stenographer in the general offices, he rose step by step through the offices of divisional superintendent, general superintendent, general manager of western lines, and western vice president to his new and onerous position, which, however, is not likely to mark the bounds of his career. In all of these capacities, Mr. Bury has made good. His high reputation has been justly earned and is thoroughly deserved.

"Until within a few years, Mr. Bury's remarkable talents were applied almost entirely to the technical business of operating a railway efficiently and economically; but in the position which he has lately held in Winnipeg he has had to deal with the still more exacting problems arising from the adjusting of the relations between the railway and the public. There have been some classic examples of great railway operators making shipwreck of their careers by their inability to deal with the public. No man can be a great railway administrator in Canada at the present time unless he has many of the qualities of the successful public man. The people of the west, who have had substantial grounds for their grievances against the railways, have noted, with pleasure, increasing indications that Mr. Bury has the viewpoint of the modern twentieth century railway manager, which puts the railway where it belongs as the servant of the public which employs it and makes possible its success. This, in the present state of public opinion —which is not likely ever to revert to its old attitude of patient submissiveness—is the only road to peace and prosperity for railways.

"Mr. Bury will take with him to Montreal the good wishes of the people of Western Canada, and their confident expectation that in this great field in which his energies and abilities will find ample room to play he will repeat, on a larger scale, the notable successes which have made his career to date so remarkable."

Grand Trunk Railway Betterments, Construction, Etc.

Track Elevation in Montreal.—A report on track elevation in the city was, on Nov. 19, stated to be ready for presentation to the city council. The estimated cost of the work, based on G.T.R. plans, is $8,211,000. It is made up of the revised estimate of $5,903,745 with the addition of the following percentages:—For general expenses and contingencies, 5%; for interest on cost of construction for two years, 6%; consequential damages, $500,000; commission for financing, 3%. The engineering questions involved are now under study by G. R. Macleod, city engineer on railways and bridges. He is engaged chiefly in checking the estimates and determining how far expenditure has been entailed by changes asked by the city.

Port Huron, Mich., Shops.—The residents of Port Huron, Mich., Nov. 21, concluded a canvass in the city to raise $100,000 as a bonus to the company to rebuild the car shops which were burned about a year ago. The company invited the city to give a bonus of $100,000, promising to spend $75,000 for land, and $250,000 on the first section of the buildings. The company does not propose to build on the old site, but has chosen that now occupied by the Port Huron Engine and Threshing Co. (Nov., pg. 508.)

Abandonment of a Railway in New York State.

The N.Y. Supreme Court issued an order some little time since to the receiver of the Buffalo and Susquehanna Ry. to cease operating trains and take up the track from Buffalo southeast to Wellsville, N.Y., 90 miles. The line has been in the hands of a receiver for over two years. It is the least profitable part of the B. & S.R. lines to operate. Lines located further south in Pennsylvania do an extensive coal business, but the difficult grades to the north make it cheaper to send the coal to lake ports over other roads than to haul it over the B. & S. line from Wellsville. The abandonment of the road will be a serious matter to the farming communities along it which depend upon it for transportation. The roadbed and tracks are in good condition, and represent an investment that could not be replaced, probably short of $2,000,000. Residents along the line appealed to the N.Y. Public Service Commission. Through the efforts of that body, the execution of the court's order was postponed for a month, in the hope that someone could be found willing to take over and operate the road.

Calgary Stockyards.—The Calgary, Alberta, City Council decided, Nov. 13, to submit a bylaw to the ratepayers at the annual municipal elections for the purpose of authorizing the raising of $240,000 by debentures to purchase the Alberta stockyards from the C.P.R.

THE VICTORIA ROLLING STOCK & REALTY CO., OF ONTARIO, LIMITED.

Notice is hereby given that a dividend of three per cent. on the paid-up capital stock of the Company for the half-year ended Nov. 30th, 1914, has been declared payable Dec. 1st, 1914, to the shareholders on record as of the 30th of Nov., 1914.

By order of the Board.

G. T. CHISHOLM, Secretary.

Toronto, Nov. 20th, 1914.

Power House Equipment for Leonard Shops, Quebec, National Transcontinental Railway.

Tenders were received up to Dec. 1 for the power equipment for the N.T.R. Leonard shops power house, Quebec. There were four separate specifications, viz.: water tube boilers and chain grate stokers, feed water heater, engines or turbines, and generators, switchboard and wiring.

There are to be five 500 b.h.p. high pressure (200 lb.) water tube boilers, arranged in 2½ batteries, fed with chain grate mechanical stokers. Each stoker will be capable of burning sufficient semi bituminous slack coal or crushed run of mine coal to develop 150% of the rated capacity for 2 hours, and 165% for shorter periods. The combined efficiency of each stoker and boiler will be at least 70%. The fifth boiler will be arranged so that the stoker will satisfactorily burn either coal or refuse from the mill or carpenter shop, from which the refuse will be brought to the furnace by an exhaust system. The economy of each boiler at its normal rated capacity will not be less than an equivalent evaporation of 8½ lbs. of water from and at 212 degrees Fahr. per lb. of run of mine bituminous coal, containing approximately 12,000 b.t.u., with due allowance for moisture in the coal and ash. The steam must not contain more than 2% moisture 5 ft. from the main stop valve. The boilers will carry a guarantee that when properly operated they will be smokeless at least 95% of the time. Each boiler will have a superheater that under normal working conditions will give a superheat of at least 100 degrees Fahr. It will be so arranged as to be capable of being flooded when getting up steam. All exposed parts of the boiler will be protected by a 4 in. layer of non conducting material, in the form of blocks of plastic cement. Each boiler will be equipped with a full set of gauges and tools. There will be a feed water heater of sufficient capacity to heat 80,000 lbs. of water per hour from 60 to 210 degrees Fahr., and capable of standing a hydrostatic pressure test of 15 lbs. per sq. in. It will be of the sectional built up type, with doors through which the trays may be removed. It will have a baffle plate oil separator, a balanced feed valve operated by a copper float to maintain a constant level of water, an automatic overflow relief valve to relieve the water when it rises too high, and a filter so arranged that the sludge may be blown off.

Alternative proposals were invited for reciprocating engines and horizontal steam turbines for the main power, the latter of the bleeding type, to operate at 3,600 r.p.m. The engines specified are to be two vertical 3 cylinder, 3 crank, compound non condensing forced lubrication, to develop continuously 750 h.p. at full normal load at 360 r.p.m. with 200 lbs. steam at the throttle, when exhausting against 5 lbs. back pressure in the exhaust pipe. They are to be capable of carrying a 25% overload. Each of these will be direct connected to a 500 k.w., 360 r.p.m., 3 phase, 60 cycle, 600 volt, engine type, revolving field, a.c. generator. The alternative specification for the turbine called for a generator to meet the different requirements of the higher speed. Each generator will have, direct connected, a 20 kw., 250 volt, 360 r.p.m., d.c. compound interpole exciter generator.

There will also be a compound engine similar to the above, but of the 2 crank, 2 cylinder type, to develop 150 h.p. at 450 r.p.m., with a reserve overload capacity of 25%. This engine will drive a combination unit consisting of a 75 k.w. a.c., and a 75 k.w. d.c., generator mounted on the same shaft. The a.c. generator will have the same characteristics as the 500 k.w. machines, while the d.c. generator will be a 250 volt, compound interpole machine. This combination unit is intended for early installation, as soon as there is sufficient boiler capacity, in order that it may provide power for testing the cranes and erecting the machine tools in the shops, as well as lighting the plant during construction.

There are to be two motor generator sets, each consisting of a 400 k.v.a., 720 r.p.m., 3 phase, 60 cycle, 600 volt, synchronous motor, direct connected to a 150 k.w., 250 volt, compound, interpole, d.c. generator, each unit to have a small variable speed (slip ring), 600 volt, 3 phase, starting motor, mounted on the extended shaft, and capable of being started from the switchboard. There will be an additional motor generator set, consisting of a 150 k.v.a., 720 r.p.m., 3 phase, 60 cycle, 600 volt, self starting, synchronous motor, direct connected to a 75 k.w., 250 volt, compound, interpole, d.c. generator.

The switchboards will consist of 17 panels; 4 for the 500 k.w. generator, one of which will blank, but drilled for future installations; an a.c. totality panel; 1½ for lighting; 4½ for a.c. feeders; a swinging bracket; an outside power panel; 1½ for d.c. feeders; a d.c. totality panel; a panel for the d.c. generators; and 2½ for the synchronous motors.

Railway Mechanical Conventions.—At a meeting of the joint committee of the American Railway Master Mechanics' Association and the Master Car Builders' Association, at New York, recently, it was decided that the 1915 meetings will be held at Atlantic City, N.J., those of the former June 9 to 11, and of the latter June 14 to 16. Invitations were received in addition to Atlantic City, from Washington, D.C., Chicago, Ill., and San Francisco, Cal. Several of the committee favored San Francisco, but it was concluded that few of the members would be able to undertake the long journey, and that the attendance would suffer.

Railway Route Maps Approved.—The Minister of Railways on Oct. 28 approved railway route maps as follows:

High River, Saskatchewan and Hudson Bay Ry., from Tp. 18, R. 1 w. 4 m., near Red Deer Forks, to Pas, Man., about 470 miles;

Western Lominion Ry., from Pincher, via Pincher Creek, to a point within 5 miles of Cardston, Alta., about 45 miles.

Dominion Foundation Co., Ltd., has been incorporated under the Dominion Companies Act, with an authorized capital of $50,000 and head office at Montreal, the incorporators being M. J. Butler, M. Can. Soc. C.E., Hugh Doheny, Hugh Quinlan, Angus W. Robertson and M. J. O'Brien.

C.P.R. Land Sales.—The sales for October in Manitoba, Saskatchewan, and Alberta were 18,935 acres, about 4,000 more than in September. The number of sales was 92, and of these 42 were to parties outside Canada, 40 of whom have settled in Alberta.

E. E. Trask, who is stated to be interested in the dry dock project at Owen Sound, is reported to have stated that the necessary capital to finance the scheme had been arranged for, sufficiently at least to warrant that contracts be let. He does not think that much will be done this year, but contracts should be placed within two months. The plans have been approved by the Public Works Department at Ottawa, and a Government subsidy was practically assured.

Dominion Government Grain Elevator at Vancouver, B C.

The Dominion Government received tenders to Nov. 30, for the construction of a reinforced concrete elevator at Vancouver, to complete the chain of Government terminal and interior elevators between Port Arthur and the Pacific coast.

The site has been selected on Stewart St., between Salisbury Drive and Commercial St., and the proposed plant will consist of storage house, work house, sacking plant, transformer house, conveyor galleries and track shed. The storage house will be 232 by 71 ft., with 52 circular and 32 interspace bins, with capacity for about 950,000 bush. The work house will be 126 by 62 ft., with 32 circular, 21 interspace and 15 outer space bins, with capacity for about 300,000 bush., and with passenger elevator tower 12 by 16 ft. The sacking and transformer house will be 62 by 25 ft. The track shed will be 52 by 150 ft., and there will be seven parallel tracks on the wharf, and five tracks between the wharf and the C. P. R., a total of nearly two miles. Receiving hoppers, with a capacity of 2,000 bush., will be placed at each of three car ways in the track shed, and there will be hoppers at each of the three receiving legs, making nine in all. Two sets of automatic sacking scales will be installed, each scale with a hopper capacity of from two to six bush., and capable of weighing 1,500 bush. an hour. Grain will be conveyed to vessels by two-belt galleries one on either side of the wharf. The driving machinery will consist of 40 three phase 60-cycle a.c. motors, with an aggregate horse power of 1,520.

It is stated that work will be commenced almost immediately, and be completed by Nov., 1915.

The Commissioners of the Transcontinental Railway.

NOTICE TO CONTRACTORS.

Tenders for Travelling Cranes.

SEALED TENDERS, addressed to the undersigned, and marked on the envelope "Tender for Travelling Cranes," will be received at the office of The Commissioners of the Transcontinental Railway, at Ottawa, Ont., until 12 o'clock noon of the 4th day of January, 1915, for the furnishing and erection complete, in accordance with the sketches and specifications of the Commissioners, of one or more, or all of the Travelling Cranes, as listed in the specifications, which are to be erected in the Locomotive and Car Shops Plant of the National Transcontinental Railway, at Quebec, P.Q.

Sketches may be seen and form of tender and specifications obtained at the office of Mr. W. J. Press, Mechanical Engineer, Ottawa, Ont.

Persons tendering are hereby notified that tenders must be made on the forms supplied by the Commissioners and that each tender must be signed and sealed by all the parties to the tender, and witnessed, and be accompanied by an accepted cheque on a Chartered Bank of the Dominion of Canada, payable to the order of The Commissioners of the Transcontinental Railway, for a sum equal to ten per cent (10%) of the amount of the tender.

The cheque forwarded by the party whose tender is accepted will be deposited to the credit of the Receiver General of Canada as security for the due and faithful performance of the contract according to its terms. Cheques forwarded by the parties whose tenders are rejected, will be returned within ten days after the signing of the contract.

The right is reserved to reject any or all tenders.

By order,
P. E. RYAN,
Secretary.

The Commissioners of the
Transcontinental Railway.

Dated at Ottawa, November 18th, 1914.

Newspapers inserting this advertisement without authority from the Commissioners, will not be paid for it.—70749.

Mainly About Railway People.

CHARLES KISLINGBURY, Divisional Superintendent at Bristol, Eng., of the Great Western Ry., has retired.

BRAYTON IVES, who was President of the Northern Pacific Ry. from 1893 to 1896, died recently at Ossining, N.Y.

E. B. TILT, Engineer of Tests, C.P.R., read a paper on characteristics of materials before the Canadian Railway Club in Montreal, Nov. 10.

F. H. PHIPPEN, General Counsel, Canadian Northern Ry., Toronto, was operated on in New Yorw, N.Y., Nov. 25, for gall stones.

HON. FRANK COCHRANE, M.P., Minister of Railways and Canals, left Ottawa, Nov. 24, for an inspection trip over the Intercolonial Ry.

HARRY DEAN, division freight agent, Pere Marquette Rd., Detroit, Mich., died there, Nov. 22, after 18 years service with the company.

F. J. HOLMAN, for over 40 years in G.T.R. service, during the latter half as foreman of the Bridge and Building Department at Stratford, Ont., has been superannuated.

A. H. NICHOL, Land Agent, C.P.R., died at Bowen Island, B.C., recently, from the effects of a gunshot wound, accidentally self-inflicted while on a shooting trip.

W. T. WEBSTER, who was appointed General Freight Agent, Chicago, Indianapolis and Louisville, Ry., Chicago, Ill., recently, was, in the early 90's, in the G.T.R. Freight Department.

A. S. GOODEVE, a member of the Board of Railway Commissioners, lectured before the Canadian Club at Liskeard, Ont., recently, on New Canada, an epoch in Canadian history.

SCOTT GRIFFIN, heretofore European Railway and Steamship Manager, Canadian Northern Ry., London, Eng., has returned with his wife and family to Toronto, where they will live in future.

ROBT. HOBSON, Vice President and General Manager, Steel Co. of Canada, and BASIL MAGOR, Vice President, National Steel Car Co., both of Hamilton, Ont., were in England in November.

Herbert Holt, son of H. S. HOLT, director C.P.R., Montreal, who since graduating from the Royal Military College has been with the 3rd Dragoon Guards in Egypt, is now with his regiment in France.

H. GRAY, formerly Assistant Manager Land Department, C.P.R., London, Eng., sailed from England recently for Kumasi, West Africa, where he has secured a position with a mercantile firm.

G. McLAREN BROWN, European Manager, C.P.R., London, Eng., was a member of the Lord Mayor and Sheriffs' committee for the arrangement of details for the Lord Mayor's procession and banquet there, Nov. 9.

H. R. CHARLTON, General Advertising Agent, G.T.R. and G.T. Pacific Ry., Montreal, who retired recently from the Presidency of the Montreal Press and Advertising Club, has been elected an honorary President.

William Williams, father of LADY DONALD MANN, died at St. Catharines, Ont., Oct. 28, aged 88, and was buried at Winnipeg, where he lived for some 50 years until removing to St. Catharines about ten years ago.

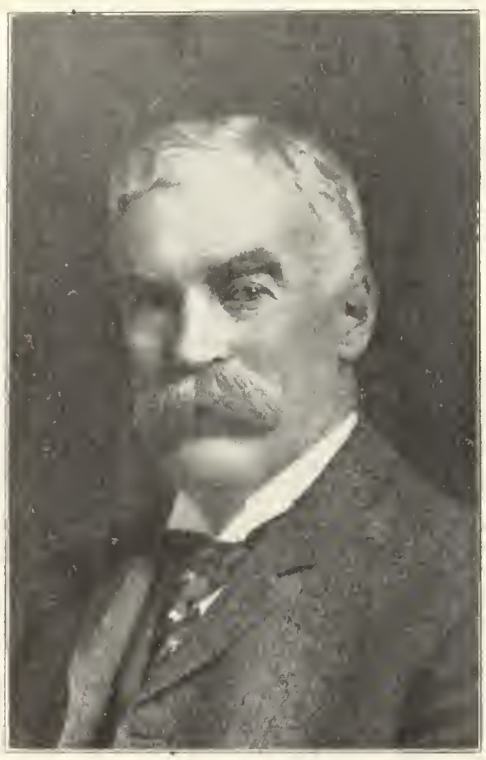
LT. COL. G. R. STARKE, Secretary-Treasurer, Dominion Transport Co., Ltd., Montreal, has been appointed Commissioner of the Boy Scouts for the Province of Quebec, succeeding the late Lt. Col. J. H. Burland.

F. E. BRADBURY, of Boston, Mass, who was accidentally killed in Chicago, Ill., Nov. 4, was concerned in the acquirement of the Canadian Northern Ry. right of way over the proposed route between Toronto, Hamilton and Niagara Falls.

A. F. STEWART, Chief Engineer, Mackenzie, Mann & Co., Ltd., Toronto, and Chairman, Canadian Society Civil Engineers, Toronto branch, gave an illustrated address before the branch on bridges destroyed during the South African war.

LT. COL. G. S. RENNIE, M.D., Surgeon in Chief, Toronto, Hamilton and Buffalo Ry., and Dominion Power and Transmission Co., Hamilton, Ont., will be in command of one of the field artillery batteries which is being mobilized in Toronto for overseas service.

A. J. TAYLOR, Canadian Freight and Passenger Agent, Chicago, Milwaukee and St.



P402 W. H. Biggar, K.C.,
Vice President and General Counsel, Grand Trunk Railway and Grand Trunk Pacific Railway.

Paul Ry., Toronto, who has been on leave of absence for some time, owing to ill-health, has gone to California for the winter, accompanied by his wife and daughter.

J. VIPOND DAVIES, Vice President of Jacobs & Davies, Inc., consulting engineers, Montreal and New York, has been awarded the Telford gold medal of the Institution of Civil Engineers, London, Eng., for his paper on the extensions of the Hudson River tunnels of the Hudson & Manhattan Rd.

The London and North Western Ry., (Eng.) directors have made the following appointments: Superintendent of the Line, L. W. Horne; Assistant Superintendent of the Line, W. M. Turnbull; Indoor Assistant to Superintendent of the Line, E. C. Grindley.

W. P. HINTON, Assistant Passenger Traffic Manager, G.T.R. and G.T.P.R., has been appointed Chairman Executive Committee, Eastern Canadian Passenger Association, vice, H. G. Elliott, formerly General Passenger Agent, G.T.R., who has been superannuated.

R. J. FLAHERTY, who has been exploring in the Labrador, Ungava and Hudson Bay districts for two or three years past, for a syndicate headed by Sir Wm. Mackenzie, was married in New York, Nov. 12, to Miss F. J. Hubbard. He is a son of R. H. Flaherty, mining engineer, Mackenzie, Mann & Co., Ltd., Toronto.

DONALD M'DERMID, who died in Toronto Nov. 1, age 70, after a long illness, was for a number of years a railway contractor and had contracts on western portions of the C.P.R. main transcontinental line in the eighties. One of his daughters is the widow of the late J. H. Graham, at one time Paymaster, and subsequently Local Treasurer, C.P.R., Winnipeg.

MAJOR J. K. BERTRAM, of Dundas, Ont., who has been appointed adjutant in the second Canadian overseas force, is a nephew of Henry Bertram, and of Col. Alexander Bertram, of the John Bertram & Sons Co., and a son of Dr. T. A. Bertram, the crack rifle shot. He is a graduate of the Royal Military College, Kingston, Ont., and is a medical student at McGill University, Montreal.

THOMAS HENRY, formerly Traffic Manager, Richelieu and Ontario Navigation Co., and now Passenger Traffic Manager, Canada Steamship Lines, Ltd., Montreal, and J. M. LYONS, ex-General Passenger Agent, Canadian Government Railways, and now Eastern Traffic Agent, Reid Newfoundland Co., Moncton, N.B., have been elected honorary members, American Association of Passenger Traffic Officers.

DUNCAN MACPHERSON, M.Can.Soc. C.E., who retired recently from the position of Assistant to the Chairman, National Transcontinental Ry. Commission, on account of the work being practically completed, except the adjusting of the final estimates and finishing up the repair shops at Quebec, is still residing in Ottawa and taking a short rest, after 33 years of continuous railway service, after which he will do consulting work for a time and perhaps take up military duties of some kind.

ELDRED DALSTON TOYE, whose appointment as Storekeeper, Ontario Grand Division, Canadian Northern Ry., Toronto, was announced in our last issue, was born at Dalston, Ont., Apr. 27, 1891, and entered railway service in July, 1909, since when he has been to May, 1910, storeman, C.N. Ontario Ry., Parry Sound; May, 1910, to Nov., 1911, assistant, Stores Department, same road, Toronto; Nov., 1911 to July, 1914, chief clerk, same department, Toronto; July to Oct. 23, 1914, Storekeeper, same road, Toronto.

GUY CALTHROP has been appointed General Manager, London and North Western Ry. of England, succeeding Sir Robt. Turnbull, formerly Superintendent of the Line, who has been General Manager since Sir Frank Ree's sudden death in February last. Mr. Calthrop, who is still in the early forties, entered the L. & N.W.R.'s traffic department in 1886. In 1902 he was appointed General Superintendent of the Caledonian Ry., and in 1908 became its General Manager. He left England in 1910, on his appointment as General Manager of the Buenos Ayres and Pacific Ry.

H. G. ELLIOTT, whose retirement from the position of General Passenger Agent, G.T.R., Montreal, was announced in our last issue, was born Aug. 22, 1860, and entered railway service in 1882, as city ticket agent, Central Vermont Ry., Montreal; he entered G.T.R. service in May, 1897, and held positions in the Traffic Department at various points until May, 1900, when he was ap-

pointed Assistant General Passenger and Ticket Agent. He was subsequently First Assistant General Passenger Agent at Montreal, and was until Mar., 1911, in a similar position at Chicago, Ill., when he was appointed General Passenger Agent at Montreal.

THOMAS EEDSON, formerly Freight Accountant and Freight Claim Agent, Michigan Central Rd., Detroit, Mich., who died there, Nov. 1, was born at Niagara Falls, Ont., Jan. 4, 1842, and entered railway service in 1872, in the Treasurer's office, Canada Southern Ry. during construction, and continued with that company as cashier from the commencement of its operation until its amalgamation with the Michigan Central Rd., Jan. 1, 1883, since when he was consecutively, to Sept., 1883, clerk at St. Thomas, Ont.; Sept., 1883, to Jan., 1884, clerk, Auditor's office, Detroit, Mich.; Jan. 1, 1884, to Oct. 1, 1886, Chief Travelling Auditor; from Oct. 1, 1886, Freight Accountant and Freight Claim Auditor, all with Michigan Central Rd.

KEITH ROSS CAMERON, who died in Toronto, Nov 5, aged 42, of pneumonia, was in railway service for a number of years. He started as a boy in the Northern Ry.'s service in Toronto, in the office of Jas. Webster, now President and Manager Caraquet and Gulf Shore Ry., Bathurst, N.B., being transferred to Allandale, Ont., as operator, when the Northern was taken over by the Grand Trunk. Subsequently he was an operator on the Duluth South Shore and Atlantic Ry., at Marquette, Mich., and then went to the Lake Erie and Detroit River Ry., serving first as dispatcher, and then as trainmaster at Ridgetown, Ont. After the L.E. & D.R. was taken over by the Pere Marquette, he was in the Canadian Freight Association's office in Toronto, from 1910 to 1912, under T. Marshall, and latterly was in real estate business.

LORNE CAMERON THOMSON, whose appointment as General Storekeeper, Eastern Lines, Canadian Northern Ry., Toronto, was announced in our last issue, was born at Kingston, Ont., Nov. 25, 1882, and entered railway service May 1, 1897, since when he has been, to Nov., 1900, in General Storekeeper's office, C.P.R., Montreal; Nov., 1900, to Feb., 1901, storekeeper. C.P.R, Quebec. Que.; Feb., 1901, to May, 1902, storekeeper, C.P.R., Brownville Jct., Me.; May, 1902, to June, 1904, Divisional Storekeeper, C.P.R., McAdam Jct., N.B.; June, 1904, to Aug., 1905, Divisional Storekeeper, C.P.R., Farnham, Que.; Aug. to Oct., 1905, storekeeper, Section A, Angus Shops, C.P.R., Montreal; Oct., 1905, to Mar., 1907, chief clerk to General Storekeeper, C.P.R., Montreal; Mar., 1907, to Dec., 1911, storekeeper, Canadian Northern Ontario Ry., Parry Sound, Ont.; Dec., 1911, to June, 1914, storekeeper, C.N. Ontario Ry., Toronto; June to Nov., 1914, Division Storekeeper, Ontario Grand Division, Canadian Northern Ry., Toronto.

In connection with the inauguration recently of through passenger service on the Grand Trunk Pacific Ry., it is interesting to note the experience H. McCALL, Superintendent at Edson, Alta., has had in connection with its operation. He was associated with the first mixed and passenger services on the line from Portage la Prairie, Man., westwards, in their various stages from Portage la Prairie Edmonton, Alta., and thence westward to Edson, Alta. From Edson and Jasper, B.C., he has handled all traffic east and west for the past three years, and in September supervised the operation on his division of the first through express trains between Edmonton and Prince Rupert, B.C., and accompanied the same through his division. In addition to supervising the operation of the line west of Edmonton to Prince George, B.C., he had charge of track laying on about 450 miles of the Mountain Section. He has been in the company's service over 9 years, living most of the time on his car.

JAMES NEIL MURPHY, whose appointment as Trainmaster, C.P.R., Souris, Man., was announced in our last issue, was born at Mooretown, Ont., May 10, 1879, and entered railway service in July, 1897, since when he has been, to June, 1898, operator, Manitoba and Northwestern Ry., Winnipeg; June 20, to Sept. 3, 1898, operator, C.P.R., Winnipeg; Sept. 3, 1898, to Dec. 15, 1899, ticket clerk, C.P.R., Brandon, Man.; Dec. 15, 1899, to Mar. 11, 1900, operator, Columbia and Western Ry., Smelter Jct., B.C.; Mar. 11, to Oct. 15, 1900, Division Engineer's clerk, C.P.R., Smelter Jct., B.C.; Oct. 15, 1900, to Feb. 2, 1901, storekeeper, Trail Smelter, Trail, B.C.; Feb. 2, 1901, to May 1, 1902, Division Engineer's clerk, C.P.R., Trail, B.C.; May 1, 1902, to Jan. 7, 1905, accountant, Construction Department, C.P.R., Winnipeg; Jan. 7 to May 21, 1905, clerk, C.P.R., Kenora, Ont.; May 21 to July 19, 1905, dispatcher, C.P.R., Lipton, Sask.; July 19 to Oct. 11, 1905, clerk, C.P.R., Kenora, Ont.; Oct. 11, 1905, to Feb. 1, 1909, chief clerk, C.P.R., Kenora, Ont.; Apr. 7, 1909, to Apr. 27, 1910, instrumentman, C.P.R., Alberta Division; Apr. 27, 1910, to Sept. 16, 1914, Resident Engineer, C.P.R., Alberta Division.

D. McNICOLL, Vice President, C.P.R., Montreal, whose retirement is announced, effective Jan. 1, was born at Arbroath, Scotland, Apr. 7, 1852, and entered railway service Aug. 20, 1866, since when he has been, to 1873, clerk, Goods Manager's office, North British Ry., in Scotland; 1873 to 1874, similar position with the Midland Ry., in England; 1874, billing clerk, Northern Ry., Collingwood, Ont.; 1874 to 1881, chief clerk, General Manager's office, Toronto, Grey and Bruce Ry.; 1882 to 1883, General Freight and Passenger Agent, Eastern and Ontario Divisions, C.P.R.; 1889 to Jan., 1896, General Passenger Agent, all lines and steamships, C.P.R.; Jan., 1896, to Apr., 1899, Passenger Traffic Manager, C.P.R., Montreal; Apr., 1899, to Apr., 1900, Assistant General Manager, C.P.R., Montreal; Apr., 1900, to Dec., 1903, Second Vice President and General Manager, C.P.R., Montreal; Dec., 1903, to date, Vice President (Senior), C.P.R., Montreal. He was elected a director of the company in 1904, and was also appointed a member of the Executive Committee in 1906. It is announced that he will retain the two latter positions. He is also a director of Molson's Bank. While in Toronto, Nov. 24, Mr. McNicoll is reported to have stated that he has been granted a year leave of absence by the President, and he intends spending this in travelling, chiefly in the south.

Railway Rolling Stock Notes.

The C.P.R., between Oct. 15 and Nov. 15, ordered 23 steel flat cars and 265 steel frame box cars from its Angus shops, Montreal.

The Quebec Central Ry. is reported to have ordered 2 American (4-4-0) locomotives, to be built in its own shops at Sherbrooke, Que.

The C.P.R., between Oct. 15 and Nov. 15, received the following rolling stock from its Angus shops:—8 steel first class cars, 88 steel frame box cars, 2 refrigerator cars, 2 single track flangers. 3 double track flangers and 1 class D4 locomotive.

The Canadian Northern Ry., Sept. 12 to Nov. 12, received the following additions to rolling stock: 11 colonist cars from Canadian Car and Foundry Co., 10 colonist cars from Crossen Car Co., 3 baggage cars from Preston Car and Coach Co., and one consolidation locomotive from Canadian Allis Chalmers, Ltd.

The G.T.R. has rceived 12 first class cars from Canadian Car and Foundry Co., 2 baggage cars from National Steel Car Co., 5 mail cars from Pressed Steel Car Co., and 2 suburban locomotives from Montreal Locomotive Works.

The 8 steel sleeping cars which the Intercolonial Ry. has ordered from the National Steel Car Co. will have steel underframes and exteriors, with steel bunks and partitions, and be in 10 sections with drawing room at each end. The bodies will be 73½ ft. long, 10 ft. wide over eaves, and 14 ft. 2 ins. high from rail to top of roof. The bodies will be mounted on 6 wheel trucks. The price of these cars is $28,250 each.

We are officially advised that the Intercolonial Ry. has ordered rolling stock as follows:—6 first class cars from Canadian Car and Foundry Co.; 8 all steel sleeping cars from National Steel Car Co.; 4 steel frame, interior wood finish, sleeping cars from Preston Car and Coach Co. It is also stated that 200 standard steel flat cars, 80,000 capacity, have been ordered from the Nova Scotia Car Works, and 250 freight cars, 50 tons capacity, from the Eastern Car Co.

Following are chief details of the 6 steel frame first class cars which the Intercolonial Ry. has ordered from Canadian Car and Foundry Co., to be built at its Amherst, N.S., works:

Length over end sills	74 ft.
Width over side sills	9 ft. 9½ ins.
Underframe	Steel fish belly type.
Draft gear	Tandem.
Vestibule	Steel construction, steel trap doors and steel frame steps.
Air brakes	Westinghouse LN—1812.
Heating	Gold Car Heating Co.
Lighting	30 volt.
Trucks	Simplex all steel 6-wheel, 80,000 lbs. capacity.
Weight complete	141,000 lbs.

The New Ladysmith Lumber Co., Nanaimo, B.C., ordered a 2-4-2 saddle tank locomotive recently from Canadian Locomotive Co., delivery being made in November. Following are the chief details::

Weight on drivers	40,000 lbs.
Weight, total	55,000 lbs.
Wheel base, rigid	5 ft.
Wheel base, total	18 ft. 6 ins.
Heating surface, firebox	43 sq. ft.
Heating surface, tubes	360 sq. ft.
Heating surface, total	403 sq. ft.
Driving wheels, diar.	40 ins.
Driving wheel centres	Cast iron
Cylinders, diar. and stroke	12 by 16 ins.
Boiler, type	Radial stayed
Boiler pressure	165 lbs.
No. and diar. of tubes	100—1¾ ins.
Length of tubes	7 ft. 11 ins.
Injectors	Ontario
Safety valves	Locomotive pop
Brakes	Westinghouse automatic
Packing	Metallic
Tank capacity	750 imp. galls.
Coal capacity	2,000 lbs.

Following are the chief details of the 4 baggage and 2 postal cars which the Intercolonial Ry. has built in its Moncton Shops, and which have been mentioned in a previous issue:—

	Baggage	Postal
Underframes	Steel.	Steel.
Length over end sills	60 ft. 10⅝ ins.	65 ft. 10⅝ ins.
Length over buffer face plate	64 ft. 8⅝ ins.	69 ft. 8⅝ ins.
Length inside	60 ft. 0⅜ ins.	65 ft. 0⅜ ins.
Width over side sills	9 ft. 9 ins.	9 ft. 9 ins.
Width inside	8 ft. 10⅜ ins.	8 ft. 10⅜ ins.
Height of rail to top of roof	14 ft. 2 ins.	14 ft. 2 ins.
Trucks, type	4-wheel	6-wheel
Trucks, design	Simplex	Simplex
Trucks, material	Steel	Steel
Truck wheel base	8 ft.	11 ft.
Trucks, centre to centre	44 ft. 10 ins.	49 ft. 10 ins.
Lighting	Gas	Gas
Heating	Straight steam	Straight steam
Journal boxes	McCord	McCord
Brake beams	Simplex	Simplex

Transportation Appointments Throughout Canada.

The information under this head, which is almost entirely gathered from official sources, is compiled with the greatest care, so as to ensure absolute accuracy. Anyone who may notice any error in our announcements will confer a favor by advising us.

Canada Steamship Lines. — THOMAS HENRY has been appointed Passenger Traffic Manager. Office, Montreal. The position of Operating Superintendent of Passenger Steamers, heretofore held by him, has been abolished. Pursers, stewards and the company's hotels will hereafter be under the Passenger Traffic Manager's jurisdiction.

Canadian Government Railways.—R. A. KLOCK, heretofore General Tie and Timber Agent, Moncton, N.B., has been assigned to other duties there.

H. B. FLEMING, Superintendent, National Transcontinental Ry., between Moncton and Edmundston, N.B., under operation by the Canadian Government Railways, has had his jurisdiction extended to cover the N.T.R. between Moncton, N.B. and St. Jean Chrysostome, Que., which is on the St. Charles Branch, I.R.C., 12.9 miles west of St. Charles Jct., and 4 miles east of Chaudiere Jct., and is the junction point with the N.T.R.

HOWARD A. RYAN has been appointed Assistant Superintendent, National Transcontinental Ry., between Edmundston, N.B., and St. Jean Chrysostome, Que., in charge of station service, train service and track. Office, Monk, Que.

Canadian Northern Ry.—WM. PHILLIPS, heretofore European Traffic Manager, has been appointed European Railway and Steamship Manager, vice Scott Griffin, who has returned to Canada. He will also continue to perform the duties of European Traffic Manager. Office, London, Eng.

H. B. AKIN, heretofore in the Stores Department, C.P.R., Moose Jaw, Sask., has been appointed Division Storekeeper, Quebec Grand Division, C.N.R. Office, Joliette.

F. E. HARTSHORN has been appointed Trainmaster, Quebec Division, Quebec Grand Division, vice J. Fagan, transferred at his own request to the train service. Office, Joliette.

J. A. PATTERSON, who was City Ticket Agent at Niagara Falls, N.Y., during the summer, has been appointed City Ticket and Express Agent at Belleville, Ont.

F. H. DUNKLEY, heretofore machinist, has been appointed gang foreman, Winnipeg Shops, vice W. Webster, resigned.

Canadian Pacific Ry.—J. A. MOORE, heretofore Car Foreman, White River, Ont., has been appointed Car Foreman, Muskoka, Ont., vice E. E. Potter, on leave of absence for military duty.

JOHN FLYNN, heretofore carpenter, London, Ont., has been appointed Car Foreman, White River, Ont., vice J. A. Moore, transferred.

D. D. COSSAR, heretofore Locomotive Foreman, Moose Jaw, Sask., has been appointed Locomotive Foreman, Winnipeg.

G. ARMSTRONG, heretofore Bridge and Building Master, Regina, Sask., has been appointed Bridge and Building Foreman there.

T. S. BERTRAM, heretofore Locomotive Foreman, Revelstoke, B.C., has been appointed Locomotive Foreman, Moose Jaw, Sask., vice D. D. Cossar, transferred.

W. H. WORTMAN, heretofore Shop Foreman, Vancouver, B.C., has been appointed General Foreman Ogden Shops, Calgary, Alta., vice A. Sturrock, transferred. The position of shop foreman at Vancouver will not be filled.

W. E. CLINE, heretofore Chief Dispatcher, Cranbrook, B.C., has been appointed Chief Dispatcher, Edmonton, Alta., vice C. W. Fisher, transferred.

C. W. FISHER, heretofore Chief Dispatcher, Edmonton, Alta., has been appointed Chief Dispatcher, Lethbridge, Alta., vice W. J. Manley.

J. S. CARTER, formerly General Agent, Atlantic Steamships, Winnipeg, has been appointed District Passenger Agent, Nelson, B.C.

A STURROCK, heretofore General Foreman, Ogden Shops, Calgary, Alta., has been appointed District Master Mechanic, Cranbrook, B.C., vice A. Mallinson.

W. J. PENTLAND has been appointed City Passenger Agent, St. Louis, Mo., vice T. J. Barnes, resigned.

Erie Rd.—S. J. SHARP has been appointed Canadian Passenger Agent. Office, Toronto

Grand Trunk Pacific Ry.—L. C. PEARSON has been appointed station agent at Prince George, B.C.

Grand Trunk Ry.—We are officially advised that no appointment of Signal Engineer has been made to fill the vacancy caused by the departure of Lieut. R. F. MORKILL for active service in Europe.

The following station agents have been appointed:—Newtonville, Ont., F. G. Greenfield; Omemee Jct., Ont., V. H. Fisher; Markham, Ont., H. S. Snider; Tavistock, Ont., G. F. Holley; Suspension Bridge, N.Y., H. G. Smith; outside agents:—Montreal, Windsor Hotel, L. W. Lindsay; Berlin, Ont., A. E. Pernfuss; Wallaceburg, Ont., McDougall and Martin. The station at Humberstone, Ont., has been closed.

Montreal Warehousing Co., Ltd.—A. T. LANE is acting Manager and Secretary, no permanent appointment having yet been made of a successor to the late G. H. Hanna.

National Transcontinental Ry.—See Canadian Government Railways.

Toronto, Hamilton and Buffalo Ry.—T. McCLYMONT has been appointed Foreman Boiler Maker, Hamilton, Ont., vice F. Fell, acting Foreman.

White Pass and Yukon Ry.—A Seattle, Wash., press dispatch of Nov. 2, says O. L. DICKESON has announced his intention of resigning as president of the W.P. & Y.R. and the Yukon Navigation Co., and that he will probably relinquish his duties about Feb. 1.

Burrard Inlet Tunnel and Bridge Company's Proposed Bridge.

The report of R. Modjeski, consulting engineer, Chicago, on the plans and tenders referred to him, was considered by the directors, Nov. 13. The report covers 31 pages of typewritten matter, and thoroughly analyses the three plans submitted to Mr. Modjeski, which were the alternative plans put in competition with the design for the bridge over the Second Narrows at Burrard Inlet prepared by Sir Wolfe Barry, which was found to be too expensive.

The report in its opening statement says:—"Probably on account of the lack of time that the bidders had in preparing alternate designs all three of the plans are mostly sketches lacking in sufficient detail and are not in proper order to serve as contract plans. There has been an evident tendency on the part of the bidders to conform as much as possible with the official plans, which in a measure accounts for some inconsistencies and for the bidders hesitating to meet the local conditions frankly. The three tenders are placed in the following order of merit:—Canadian Bridge Co. and Missouri Bridge Co., $1,846,000; Dominion Bridge Co., $1,916,000; C. A. P. Turner and the Western Foundations Co., $1,744,881.

The report suggests that neither of the tenders be accepted, but that the tenderers be given an opportunity to revise their plans and estimates in the light of his criticism. Perhaps a better way, however, it is suggested, would be for the Board to have a new and complete set of plans prepared and invite new bids thereon. In this connection the report contains the following suggestions:—"Your official design should embody the various points in this report, the principal ones being:—A substantial substructure with pneumatic foundations similar to the design of the Missouri Bridge and Iron Co. A deeper draw span similar to the one shown on accompanying diagram to avoid deflection, designed as a continuous structure. A single long fixed span, similar to the design furnished by Mr. Turner, on condition that a change in the crown grant for portions of the bed of the Narrows may be secured. An approach viaduct of girders supported on reinforced concrete base similar to the design prepared by Mr. Turner."

In a drawing attached to the report Mr. Modjeski shows an arrangement of the electric railway tracks and highway floor for the main bridge different from what appears on the plans submitted by the bidders. The tracks are shown near the east truss, leaving an unobstructed 18 ft. roadway in the centre. An advantage of this plan, it is claimed, is that the floor beams will be somewhat lighter and therefore more economical, while the two trusses will be nearly alike. The electric railway tracks could either cross over to the centre of the highway approach as soon as they leave the main bridge or remain on one side until the end of the approach is reached.

The directors decided to send a copy of the report to the Provincial Government, and to the Department of Railways at Ottawa, before taking it up for further consideration. (See Railway Developments, pg. 544 this issue.)

Suit Over Rogers Pass Tunnel Contract.

Particulars have been filed in the British Columbia courts in connection with the action J. A. McIlwee & Sons, Denver, Col., against Foley, Welch & Stewart, in which $539,756 is claimed. Foley, Welch & Stewart are contractors, to whom the C.P.R. let the contract for boring the tunnel, with connecting lines, at Rogers Pass, B.C., at an estimated cost of about $10,000,000. It is set out in the particulars that the plaintiffs entered into a contract for the boring of a five mile tunnel, the defendants to provide tools, mules, equipment, air for ventilation and for drilling purposes, and to make monthly advances on account of work done. The plaintiffs undertook to drive 900 ft. a month, and were to receive a bonus of $1,000 for every foot of tunnel driven beyond the 900 ft. a month, the total bonus to be earned not to exceed $250,000. Work was started April 2, and so much was done that early in September $215,076 had been earned on bonus account. The plaintiffs allege that the defendants then began to hinder them in their work, and that, after considerable friction, the general contractors annulled the sub contract Sept. 24. The claim is made up as follows: Bonus earned, $215,076; bonus which they were prevented from earning, $34,924; loss of profit on contract for pioneer tunnel, $125,325; loss of profit on contract for centre tracking, $164,036.

In painting steel cars, whenever possible, every sheet on the roof should be sand blasted and primed with red lead immediately after.

Canadian Pacific Railway Construction, Betterments, Etc.

Algonquin Hotel.—We are officially advised that plans for the main wing of the new Algonquin Hotel, St. Andrews, N.B., have been prepared by Barrot, Blackader and Webster, under the direction of D. H. Mapes, Superintendent of Building Construction, C.P.R. The plan follows the old lines, a main building with two wings. The building stands on a site of 20,000 sq. ft., and will be constructed almost entirely of reinforced concrete—terra cotta partitions being utilized in the interior. In order to give an artistic appearance to the front of the main building a quantity of lumber, embedded in concrete will be employed. The roof will be of red slate The building will consist of four stories and two basements. The building is intended to be plain and simple both inside and out, but is to be equipped with all modern appointments. The staircases and stairwalls are to be absolutely fireproof and are to be provided with swing doors opening on to fire corridors, so that in case of fire the occupants of each separate section can gain access to these staircases, and be able to get out without going through the fire. The building is being erected by P. Lyall and Sons Construction Co., Montreal.

Eastern Division.—In connection with the new station facilities at the Palais, Quebec, two large freight sheds are under construction north of the present freight sheds and close to the bank of the St. Charles River. The shed for incoming freight is 600 by 50 ft., and that for outgoing 400 by 30 ft. The concrete foundations of the incoming freight shed were completed Nov. 1, and the steel superstructure is in course of erection, while the concrete foundations for the outgoing shed were expected to be finished Nov. 30. The two sheds are expected to be ready for business May 1, 1915. The present freight sheds and the existing passenger station will then be demolished and a new union passenger station erected on the site for joint use with the National Transcontinental Ry. The plans for this building are in course of preparation. The tracks in the yard are to be rearranged to meet the new conditions.

The Board of Railway Commissioners has authorized the rebuilding of the Lachine swing span, 43.1, Farnham Subdivision, Highlands, Que.

Ontario Division.—The south spans of the new double track bridge across the Humber River between Lambton and Islington, were being placed in position Nov. 20. It is expected that the work will be entirely completed and the double track fully in operation early in December.

Second Track, Main Transcontinental Line.—The Board of Railway Commissioners has authorized the operation of trains over further sections of the second track under construction on the Cartier, Chapleau and Nipigon Subdivisions.

In a recent interview George Bury, Vice President, is reported to have said that about half the main line mileage between Fort William, Ont., and Vancouver is double track During this year about 350 miles of second track have been completed, viz., west of Brandon, Man., 40 miles; in the vicinity of rBoadview, Man., 30 miles; between Indian Head and Moose Jaw, Sask., 84 miles; in the vicinity of Swift Current, Sask., 56 miles; west of Revelstoke, B.C., 25 miles; in the Kamloops district, 34 miles; east of Vancouver, 80 miles. Total, 349 miles.

Manitoba Division.—The extension of the branch line heretofore terminating at Gimli was opened for traffic to Icelandic River, 25.4 miles, Nov. 9. The name Icelandic River has given place to Riverton, the change being announced at the public celebration which took place.

Saskatchewan Division.—A large number of men have been employed in Moose Jaw, and sent out to some grading work, north of Elbow. This is probably grading on station yards and sidings.

On the Weyburn-Lethbridge line, which was opened for traffic to Gowanlock, Oct. 7, the train service has been extended 7 miles to Altawan, a station on the Saskatchewan-Alberta boundary.

Alberta Division.—The Board of Railway Commissioners has approved of revised location plans for the Swift Current northwesterly branch from mileage 111.25 to 122.53, the section ending at sec. 15, tp. 23, r. 2, west 4th meridian.

In connection with construction on the Weyburn-Lethbridge line in Alberta, the line is being operated easterly from Sterling, the junction point with the old Alberta Ry. and Irrigation Co.'s line, to Foremost. Grading easterly from Foremost was reported, Nov. 4, to have been completed for 25 miles, and G. H. Webster's contracting outfit has laid up for the season. The distance from the end of grade to the Alberta-Saskatchewan boundary is 42 miles. No contract has been let for grading this.

The question of the laying of a transfer track between the C.P.R. and the Grand Trunk Pacific Ry. in Calgary is under consideration by the Board of Trade and representations have been made to the two companies.

Pacific Division.—The Board of Railway Commissioners has approved revised location plans on the main transcontinental line, mileage 30 to 33, on the Thompson Subdivision, and to lay a second track across two highways in that mileage. This is a re-location of a portion of the line which is necessary in connection with the second track construction now in progress.

Revised location plans have been approved by the Board of Railway Commissioners for the Kootenay Central Ry., under construction, mileage 96.16 to 102.41. (Nov., pg. 504.)

The Late F. Augustus Heinze.

F. A. Heinze, who died at Saratoga, N.Y., Nov. 5, aged 42, of cirrhosis of the liver, was, at one time, largely interested in copper mining in Montana and British Columbia, and in railway building in the Pacific province. In the nineties, when President of the Montana Ore Purchasing Co., Butte, Mont., he made a contract with the Le Roi Mining Co., Rossland, B.C., to smelt 20,000 tons of ore to be taken from the Le Roi mine there. This contract involved the construction of a smelter. He organized the British Columbia Smelting and Refining Co., which located its works at the mouth of Trail Creek, on the Columbia River, 4½ miles from the Le Roi mine. It was proposed to handle the ore from the mine to the smelter by a series of horse and gravity tramways, the mine being 2,600 ft. higher than the smelter. This method of transportation was abandoned, and a narrow gauge railway was constructed under the Trail Creek Tramway Co.'s charter, work being started in the latter part of 1895. It was about 13 miles long, and extended from the wharf at the mouth of Trail Creek (now the town of Trail), through the town of Rossland to the Le Roi mine. It was built on a 4% compensated grade with curvature up to 25 degrees.

Shortly after the smelter began operation, it was found that additional railway facilities were necessary to secure a regular and economical supply of coke, and as the Crowsnest coke was then available, it was decided to build a railway from Rossland to Castlegar, where ferry connection was made with the C.P.R. at Robson. This was a standard gauge line, 29.3 miles long, and was built under the Columbia and Western Railway Co.'s charter, granted by the B.C. Legislature in 1896, which authorized the construction of a railway from Trail, via Rossland and Midway, to Penticton on Okanagan Lake. After operating the line between Rossland and Castlegar for about two years Mr. Heinze sold the interests of the British Columbia Smelting and Refining Co., the Columbia and Western Ry., and the Trail Creek Tramway to the C.P.R. for $800,000, about 270,000 acres of land in the vicinity being included in the sale.

F. P. Gutelius, now General Manager, Canadian Government Railways, Moncton, N.B., was General Superintendent, and had direct and entire charge of Mr. Heinze's railway construction and operation interests in B.C. W. F. Tye, who afterwards was Chief Engineer, C.P.R., was the Chief Engineer, and J. G. Sullivan, now Chief Engineer, Western lines, C.P.R., was Assistant Chief Engineer. A. C. Dennis, now in charge of Foley Bros., Welch and Stewart's contract for the Rogers Pass Tunnel construction on the C.P.R., was assistant engineer.

One of Mr. Heinze's first visits to Victoria, B.C., was in 1895, for the purpose of securing a charter for the Columbia and Western Ry. Among the features of his campaign was a lavish dinner at the Driard Hotel for the members of the Legislature. He secured the charter and a large land grant. He was in Victoria for the last time, a few weeks before his death, to see the Government on matters connected with the property he retained when he sold out his railway and some other interests in B.C. to the C.P.R.

An old deal in connection with the Canada Atlantic Ry.—In 1902, W. S. Webb, then President Rutland Rd., and some associates entered into an agreement to buy the Canada Atlantic Ry., along with some other lines in Canada. A deposit of $250,000 was paid in Jan., 1902, on an option expiring in May of that year. One of the members of the syndicate was to do the financing, and it was understood that the Rutland Rd. would take over the purchase. The financial houses refused to aid in getting the $11,000,000 necessary to carry through the deal, because W. S. Webb could not secure the guarantee of bonds from the Rutland Rd. H. L. Sprague, the third member of the syndicate on the option failing, and owing to the fall in Rutland Rd. stock, which ruined Mever, sought to recover damages from Webb, alleging that it was on account of his negligence that the deal fell through. The action was decided in New York, Nov. 20, when judgment was given in favor of Sprague, damages being fixed at $239,750.

Illegal Insurance.—It has been brought to the notice of the British Board of Trade that British insurance companies have insured or reinsured goods shipped on neutral vessels against risk of capture or detention by the British or allied governments. The Board of Trade is advised that such contracts of insurance or reinsurance are prohibited by law in England, and warns British insurance companies and underwriters against undertaking such business.

H. J. M. WILSON, telegraph operator for Pellatt & Pellatt, stockbrokers, Toronto, who died there Nov. 21, was the eldest son of the late James Wilson, at one time Superintendent, C.P.R., Toronto, and afterwards Claims Agent.

Railway Development.

Projected Lines, Surveys, Construction, Betterments, Etc.

Alberta and Great Waterways Ry.—We were officially advised recently that grading had been completed to mileage 131 from the junction with the Edmonton, Dunvegan and British Columbia Ry., and that track had been laid to mileage 30. A press report of later date states that track has been laid to mileage 45, and that ballasting is practically completed for 30 miles. Our official advices further stated it is expected to finish tracklaying to the end of the completed grading by Dec. 20. Supplies will then be taken in to the end of the track for next season's work.

Press reports state that a train service will be put in operation to Sucker Creek, early in December.

The Alberta Legislature has authorized the construction of a branch line from near Lac la Biche, southeasterly to the eastern boundary of the province. (May, pg. 500.)

Algoma Central and Hudson Bay Ry.—The Board of Railway Commissioners has authorized the company to build an overhead bridge to carry the highway and the International Transit Co.'s tracks across its tracks at Cathcart St. and Weldc Avc., Tagona, Sault Ste. Marie, Ont. (Nov., pg. 500.)

Burrard Inlet Tunnel and Bridge Co.—Owing to the lack of a quorum of directors the consideration of R. Modjeski's report on the tenders for the building of the proposed bridge across the Second Narrows of Burrard Inlet, Vancouver, B.C., was adjourned recently to a date to be fixed by the president. (Nov., pg. 500.)

Central Canada Ry.—The Alberta Legislature has passed an act providing for the financing and building of the line from its junction with the Edmonton, Dunvegan and British Columbia Ry. to the Peace River Crossing; authorizing the building of a branch line from Sucker Creek to Grouard, about 30 miles, and providing for the guarantee of bonds for $20,000 a mile in aid of the construction. We are officially advised that the line starts from the Edmonton, Dunvegan and British Columbia Ry., in the vicinity of Round Lake, where there will be a divisional point, which will be named McLennan. The line then runs northwesterly to the Hart River, and along that river to Peace River Crossing, crosses the Peace River, and proceeds southerly to Dunvegan. The contractors for the building of the line are J. D. McArthur & Co., Ltd., Winnipeg. This year about 30 miles of grading has been done, and track will be laid on this mileage as soon as track laying on the E., D. and B.C. Ry. has reached McLennan. No further grading will be done until next spring. The distance from McLennan to the Peace River Crossing is about 45 miles. W. R. Smith, Edmonton, is Chief Engineer of this railway, as also of the E., D. and B.C. Ry. and of the Alberta and Great Waterways Ry. (Nov., pg. 500.)

Dominion Government Railway to Hudson Bay.—A press report states that at Oct. 31, track had been laid on 175 miles from Pas to Port Nelson, Hudson Bay. On the remaining 245 miles, a very considerable amount of grading has been done, at various points, but these are not connected up, beyond mileage 197 from Pas. The telegraph line has been completed to mileage 165 from Pas. It is expected that grading will be connected up as far as Manitou Rapids, mileage 242, by Dec. 31. At this point a steel bridge, 275 ft. long, is to be built, and it is expected to start putting in the concrete substructure as soon as it is possible to get in the plant and materials. A start will be made in the spring on putting up the station buildings. It is expected that the line will be fully completed by the end of 1916. The plant engaged on grading and bridge work, track laying and ballasting, consists of 3 steam shovels at Pas, and 2 at mileage 110; 13 locomotives; 100 Hart convertible cars and numerous box and flat cars, in addition to 2 passenger cars being operated as far as mileage 110. (Nov., pg. 500.)

An Ottawa dispatch, Nov. 16, states that the latest reports from construction headquarters show that 180 miles of track have been laid, and that in all 325 miles of grading have been completed. Grading and other work will be continued during the winter.

Edmonton, Dunvegan and British Columbia Ry.—We are officially advised that grading has been completed from Edmonton, Alberta, to mileage 290, which is 12 miles from the Big Smoky River, and that track has been laid to mileage 200. It is expected to have track laid to the end of the completed grading early in December. (Nov., pg. 500.)

Erie and Ontario Ry.—The Board of Railway Commissioners has approved of the location and detail plans of the station at Canal and Bridge streets, Dunnville, Ont. (Nov., pg. 500.)

Glengarry and Stormont Ry.—The Board of Railway Commissioners has authorized the company to connect its tracks with the Ontario and Quebec Ry. (C.P.R.) 700 feet east of mileage 37, Smiths Falls subdivision, mileage 0 of the G. and S. Ry.

Track was reported Nov. 7 to have been laid from St. Polycarpe, Que., to the east of the station in Cornwall, Ont. The steel for the remaining portion of the line has been delivered, and it was expected to have it laid by Dec. 1. Ballasting is in progress, and it is hoped to have the line ready for operation by Dec. 31. The passenger station at the corner of Pitt and Sixth streets, Cornwall, is practically completed, and considerable progress has been made with the freight shed, locomotive house, and turntable east of Sidney street. (Sept., pg. 418.)

High River, Saskatchewan and Hudson Bay Ry.—Application is being made to the Minister of Railways for approval of the route map of this projected railway from a point in any of the townships 25 to 29, range 1 west of the 4th meridian, Alberta, northeasterly to Saskatoon and on to the eastern boundary of Saskatchewan in either of the townships 52 to 56, and on to Pas, Man. The Saskatoon City Council has had the route map before it, and has arranged to send a representative to express the city's views upon it to the Minister. (See High River and Hudson Bay Ry., Nov., pg. 500.)

Intercolonial Ry.—A New Brunswick paper stated, Nov. 3, that four crews were putting up new and heavier bridges on the line, and that by the end of the year, 105 old and light bridges would be replaced.

Work on the old New Brunswick and Prince Edward Island Ry., taken over recently by the Railways Department, is reported to be progressing favorably. About 20,000 new ties have been put in, about four miles of new steel has been laid, and about half the mileage between Sackville and Cape Tormentine reballasted. The terminal at Cape Tormentine, the mainland terminus of the Prince Edward Island car ferry, is reported to be about half completed.

The contract for the subway under the tracks at Main St., Moncton, N.B., has been let to Soper and McDougall, Ottawa.

Kettle Valley Lines.—George Bury, Vice President C.P.R., completed a visit of inspection over the company's Western lines, including the K.V.R. now under construction, Oct. 30. The K.V.R., from Midway to Merritt, B.C., he is reported to have said; will be completed by June, 1915, when it will be taken over for operation by the C.P.R. (Nov., pg. 500.)

The Board of Railway Commissioners has authorized the opening for traffic of the line from Hydraulic Summit to Penticton, mileage 75.6 to 133.7 west of Penticton.

Lake Erie and Northern Ry.—It was announced in Brantford, Ont., Nov. 11, that the section from Brantford to Galt will be opened for traffic Jan. 1, 1915. The line has been leased to the C.P.R.

Plans for the station in Galt, filed with the Town Council, show a brick building with a 300 ft. platform, a short distance south of Main St.

A resolution has been passed by the Brantford Patriotic and War Relief Association inviting the City Council and the Board of Trade to co-operate with the L.E. and N. Ry. directors in applying to the Dominion Government to advance to the company the balance of the subsidy voted in aid of construction, in order that work on the Brantford-Port Dover section may be proceeded with. The amount is $192,000, and W. P. Kellett, General Manager, stated in a letter to the Association, Nov. 9, that it would be sufficient to finance construction for about five months. (Oct., pg. 468.)

Moncton and Buctouche Ry.—A temporary station has been provided at Buctouche, N.B., to replace the one destroyed by fire recently. A new building will, it is reported, be erected in the spring. (May, pg. 214.)

Northern Pacific and British Columbia Ry.—Application is being made to the Dominion Parliament for the incorporation of a company with this title, with power, in connection with the Northern Pacific Ry. Co., a U.S. railway, to enter into an agreement with the Vancouver, Victoria and Eastern Ry. and Navigation Co. and the Great Northern Ry., another United States railway, which owns the V.V. and E. Ry., for running rights over that line from the international boundary near Huntingdon to New Westminster and Vancouver, B.C. The applicants also desire to have power to acquire lands for station and terminal purposes. A. H. MacNeill, Vancouver, B.C., solicitor for applicants.

Pacific Great Eastern Ry.—A combination passenger and freight service has been placed in operation on the line from Squamish to the Lillooet River at Pemberton Meadows.

Plans have been deposited with the Minister of Public Works for a bridge over the Lillooet River between mileage 19 and 20, Alta., Lake Summit North, and approval has been asked for the same.

Pacific, Peace River and Athabasca Ry.—Application is being made to the Dominion Parliament to authorize the building of the following additional lines: From tidewater, at the head of Kitimat Arm, following the Kitimat River northerly to the summit between Kitimat and Lakelse Lake, thence northerly to the Skeena River, across that river by a high level bridge, and over the G. T. Pacific Ry., to the mouth of the Kitsumkalem River, following that river to the Seeax River, and on to the valley of the Naas River, at Aiyansh, about 112 miles; and from a junction of the Blackwater and Naas rivers along the valley of the former to the Galankeest River, on to the Skeena River, and along that river to the mouth of the Bear

River, about 57 miles. Pringle, Thompson, Burgess & Cote, Ottawa, solicitors for applicants. (Oct., pg. 468.)

Prince Edward Island Ry.—We are officially advised that the spur line connecting the existing line with the car ferry terminal under construction at Carleton Point, P.E.I., will be three miles long. The general character of the grading is light, cuttings, of red soil, requiring ploughing and picking 18 ins. below surface. The culverts are of corrugated iron pipe with concrete walls, and one having a 6 ft. concrete arch. Track is being laid with 80 lb. steel, and is to be completed to Carleton, 2.5 miles, this year. The cutting to the terminal will not be completed until the approach to the landing has been advanced sufficiently to remove the plant now in the way of railway grading. The plans of the layout of the railway terminals at the car ferry landing have not yet been completed. (Nov., pg. 501.)

St. John and Quebec Ry.—F. P. Gutelius, General Manager, Canadian Government Railways, made a trip of inspection over the completed portion of this railway, Nov. 6, and is reported to have said that everything was nearly ready so that it could be taken over for operation as a branch of Intercolonial, under the terms of the agreement. The section completed is between Centreville and Gagetown, 120 miles, and gives connection with Fredericton, an entrance having been arranged for with the Intercolonial Ry. and the C.P.R. The entrance is from the south by laying a second track on the C.P.R. right of way from Victoria Mills to the I.R.C., Y., then along the I.R.C. tracks, crossing the spur north of the C.P.R. tracks by a diamond.

In connection with press reports as to the probable starting of construction on the Quebec Extension Ry. from Washburn, Me., to the Quebec boundary, we are officially advised that beyond completing surveys, no definite plans have been decided on. (Nov., pg. 501.)

Western Dominion Ry.—The Minister of Railways has approved of the route map of this projected railway to a point within five miles of Cardston, Alberta, and has directed that the line go through Cardston, in accordance with the plans approved by the Alberta Government. The Canadian Northern Ry. opposed the approval of the route submitted west of Pincher Creek into the Kootenay Pass, and the consideration of this section was postponed to enable the two companies to reach an agreement. The plans submitted to the Minister showed a route starting in tp. 5, range 5, at the Kootenay Pass, and running northeasterly through the southeast portion of tp. 6, range 4, west 5th meridian, then along the south fork of the Old Man River to tp. 6, range 1, where the river is crossed. A little further east the route crosses the survey of the Kootenay and Alberta Ry., and then proceeds almost directly for Pincher Creek. A branch line runs from Pincher Creek to Pincher station. The line proceeds easterly and southeasterly from Pincher Creek, passing a few miles to the east of Fishburn, then southerly across the Blood Indian reserve, then crossing Lee Creek some miles south of Cardston reaches Acton. The irrigation canals are crossed north of Kimball, and the international boundary is reached in tp. 1, range 23. It is reported that the line will connect at the boundary with a branch of the Chicago, Milwaukee and St. Paul Ry., or its subsidiary, the Chicago, Milwaukee and Puget Sound Ry. (Oct., pg. 468.)

Winnipeg. — The commissioners of the Greater Winnipeg Water District made a trip of inspection of the railway under construction from St. Boniface to Indian Bay, Shoal Lake, Lake of the Woods, Nov. 8. The Northern Construction Co., which has the contract for building the line, ran a special train for the party as far as Birch River, mileage 70, to which point track has been laid. A bridge with a 50 ft. span is being built at this point. Grading is practically completed to Shoal Lake, and it is expected to have track laying completed by the end of December. The total cost of the line will be about $1,250,000, and it is expected that after the construction of the water supply works has been completed it will be taken over by one of the railway companies entering Winnipeg.

The first station out of St. Boniface is at Deacon, which will be the operating headquarters. There is under construction a station building, with yards and other facilities, offices, locomotive house, and a residence for the Superintendent. The commissioners have asked tenders for 350 tons of 60 lb. steel rails, 150 kegs of track bolts, and 20 kegs of rail spikes. (Nov., pg. 501.)

Traffic Orders by the Board of Railway Commissioners.

The dates given for orders are those on which the hearings took place, and not those on which the orders were issued:—

C.P.R. Car Load Rates on Coal.

22723. Oct. 17, Re C.P.R. tariff, C.R.C. E 2870, applying on coal, in carloads. Upon the complaint of Montreal Board of Trade. It is ordered that the rates published in said tariff be suspended pending investigation by the Board.

Sand Rates to Welland Ship Canal.

22745. Oct. 24. Re application of St. David's Sand Co., Ltd., of St. Catharines, Ont., for a joint rate on sand from its pit near Niagara Falls, over the Michigan Central Rd. to Niagara Falls, and thence over the G.T.R. to the Welland Ship Canal works, where the sand is to be used. It is ordered that the M.C.R. and the G.T.R. file a joint rate of 50 cents a ton of 2,000 lbs. on sand from the applicant company's pit to Merritton, to be made effective not later than Nov. 9, 1914, the cars to be loaded to their full carrying capacity, subject to a minimum weight of 60,000 lbs.

Esquimalt and Nanaimo Ry. Freight Tariff.

22779. Oct. 28. Re application of Esquimalt and Nanaimo Ry., under sec. 327 of the Railway Act, for approval of its Standard Mileage Freight Tariff C.R.C. 268. Upon its appearing that the tolls and mileage groups of the said tariff for all distances covered by the company's railway are the same as those of the Pacific Standard Tariff prescribed for similar distances on the main land of British Columbia by general order 125, May 30, 1914, and approved by order 22412, Aug. 17, 1914. It is ordered that tariff 268 be approved until further ordered.

Victoria and Sidney Ry. Freight Tariff.

22798. Oct. 31. Re application of Great Northern Ry., under sec. 327 of the Railway Act, for approval of its Standard Freight Tariff of Maximum Tolls, C.R.C. no. V. 36, to apply on the Victoria and Sidney Ry. Upon the report and recommendation of the Chief Traffic Officer, and upon its appearing that the tolls and mileage groups of the said tariff for all distances are the same as those of the Pacific Standard Tariff prescribed for similar distances on the main land of British Columbia by general order 125, May 30, 1914, and approved by order 22412, Aug. 17, 1914. It is ordered that the said tariff, C.R.C. no. V. 36, be approved until further ordered.

The 24 railway systems in Great Britain have contributed over 54,000 men to the British colors since war was declared.

Great Northern Railway Lines in Canada.

Vancouver, Victoria, and Eastern Ry. and Navigation Co.—Application is being made to the Dominion Parliament for an extension of time for the building of the main line from Vancouver easterly, and the various branch lines authorized to be built by sec. 19, chap. 75, of the Statutes of British Columbia, of 1897; chap. 89 of the Dominion Statutes, 1898; chap. 111 of the Dominion Statutes of 1902, chap. 172 of the Dominion Statutes of 1905, and chap. 172 of the Dominion Statutes of 1910. The main lain being built under these statutes starts from Port Guichon and extends easterly, via Hope, to near Grand Forks, B.C., where it runs on to a connection with Great Northern Ry. lines in the U.S. It has amalgamated the old New Westminster Southern Ry., and at several points runs across the international boundary. It has an agreement for running rights over a section of the Canadian Northern Pacific Ry. easterly to Hope, and is interested with the Kettle Valley lines in the building of two sections easterly of the Hope Mountain Summit.

Vancouver Terminals.—O. S. Brown, of the Great Northern Ry. engineering staff, Seattle, Wash., at a recent meeting of the Vancouver City Council's Railway Committee, reported that the Woodland and Clarke drive bridges should be finished Sept. 1, 1915, and the approach to Commercial drive in April, 1915. Plans for the general terminals and the station on False Creek are in course of preparation, but no definite date can be fixed for starting that section of the work. Everything, Mr. Brown said, called for by the agreement is being done. (Nov., pg. 504.)

C.P.R. Purchases in British Columbia.—Complaint having been made a little while ago that the C.P.R. favored eastern firms, etc., in buying for its B.C. Division, a conference was held in Vancouver, Nov. 12, between R. Marpole, General Executive Assistant; F. W. Peters, General Superintendent, and a delegation from the B.C. Manufacturers' Association, at which it was shown that the complaint was unfounded. It was stated that materials, etc., of Canadian manufacture, to the value of over $600,000, were used in the construction of the station and pier at Vancouver recently, and that the largest portion of this amount was spent on B.C. products. It was also shown that during the 10 months ended Oct. 31, the company bought goods in Vancouver to the value of $356,347.

Litigation re Canada and Gulf Terminal Ry.—The hearing of the case brought by Rene Dupont against M. J. O'Brien, H. J. Lyons, and the Canada Gulf and Terminal Ry., commenced at Quebec, Nov. 2. The action involves a claim for $380,000, and the plaintiff, as organizer and participant in the construction of the road, seeks an accounting of the construction. In the course of the evidence it transpired that subsidies had been given on account of construction as follows: By municipalities, $20,600; Province of Quebec, 143,200 acres of land, and Dominion Government, $210,000.

C.P.R. Western Employes and the War.—A Calgary, Alberta, dispatch says:—Ten employes of the C.P.R. Department of Natural Resources have enlisted in the second Canadian contingent. The C.P.R. operating department in Calgary has agreed to contribute $380 a month for the duration of the war to the Red Cross Society, contributors to include mechanics and employes of the Ogden shops. The Department of Natural Resources has undertaken $116 monthly.

Canadian Northern Railway Construction, Betterments, Etc.

Canadian Northern Quebec Ry.—The locomotive house at Longue Pointe, Montreal, was destroyed by fire Oct. 30, with three locomotives, and a quantity of machinery. The loss is placed at $150,000.

Montreal Tunnel and Terminal Co.—It is reported that about a mile of the excavation necessary to complete the tunnel to its full dimensions has been done, and that about 600 ft. of the lining has been completed.

Montreal-Ottawa-Port Arthur Line.—The bridge across the Back River at Montreal was reported, Nov. 20, to be completed, but not finally passed for operation. From this bridge the line is completed to Ottawa, and beyond Ottawa to the Ottawa River at Chats Falls, where the bridge across the river was reported, Nov. 20, to be 30% completed. The grading is all completed to North Bay, and the track is laid right through with the exception of about two miles in the town of Pembroke. One lift of ballast has been given on the line through to North Bay, except for 15 miles, while a second lift of ballast has been given on about 100 miles of track to North Bay. It is expected that the steel bridge work on the line will be completed by Jan. 31, 1915. In addition to the ballasting the only work which will be carried over to 1915 will be the buildings at stations, etc.

The Board of Railway Commissioners has authorized the opening for freight traffic of the section from Cassels St., North Bay, mileage 229 from Ottawa to Capreol. From thence to Port Arthur the line is completed. It has been operated to Ruel for some time, in connection with the line via Parry Sound to Toronto. The Board of Railway Commissioners has authorized the opening for traffic of a piece of line from mileage 275 on the Toronto line to Capreol Jct. This is a divergence from the original line, necessitated by the completion of the line from North Bay.

Canadian Northern Ry.—The Board of Railway Commissioners has authorized the opening for traffic of the branch from Avonlea, on the Radville-Moose Jaw line, to Gravelburg, Sask., 80 miles.

We are officially advised in connection with the report that the Northern Construction Co. had a contract for grading for 23 miles from Medicine Hat to Hanver, Sask., that the C.N.R. has arranged to have a certain amount of grading done north of Medicine Hat by the farmers in the vicinity in order to give them employment and that the work is being supervised by the Northern Construction Co.'s staff. It is reported that 300 men with 200 teams are employed.

The Board of Railway Commissioners has authorized the opening for traffic of the line northeasterly from North Battleford, Sask., between Edam, mileage 38, and Turtleford, mileage 57.

M. H. MacLeod, General Manager and Chief Engineer, was in Edmonton, Alberta, Nov. 10, and is reported to have said that on the main line construction westerly, track had been laid to 82 miles west of Yellowhead Pass, and that ballasting had been completed to 45 miles west of the pass. It was expected to tie up the steel with the gang working easterly early in December. He also stated that arrangements were being made for putting a train service on the following mileages:—On the line from Strathcona to Camrose, 45 miles; on the main transcontinental line to Onoway, 70 miles, and from Onoway to the Pembina River on the line to the Peace River Valley, 33 miles.

Canadian Northern Pacific Ry.—A. Ferguson, representing the Department of Railways, completed a visit of inspection over the lines under construction, Nov. 17. S. H. Sykes, who accompanied Mr. Ferguson on the trip, is reported to have said track is now laid to 82 miles west of Yellowhead Pass, and it was expected to complete the tracklaying to the bridge site at mileage 85 west of the Pass, Nov. 20. The erection of the bridge at this point is expected to be completed by Dec. 31, when tracklaying will be resumed westerly, to meet the gangs working northerly from Kamloops. On this section there remain only gaps totalling 45 miles to connect up the steel being laid easterly and westerly.

Port Mann Shops.—All of the structures at the repair shop plant at Port Mann, B.C., have been completed and are ready for the installation of equipment. The main buildings are constructed of reinforced concrete with wood and steel roof trusses. The largest structure is 276 by 143 ft. in plan, and is laid out in two main bays, one for erecting and the other for repair purposes. Other structures are a 15 stall round house, an 80 ft. turntable, a store house, boarding house to accommodate 150 men, and an 80,000 gal. steel water tank on a steel tower. The main repair shop has a 30 ft. gallery or elevated platform running the full length of the building and intended for light repair work. The two main bays of this structure are to be served by 10 ton traveling cranes, and modern drill, press and lathe equipment is to be installed. For lifting locomotives there is planned an electrically operated pair of jacks which can be spaced as desired between the limits of 25 and 45 ft. The new shops are about 1½ miles from dockage facilities, where seagoing vessels come, via the Fraser River, to deliver supplies for the machine shops or the construction work now in progress in the interior of British Columbia.

Vancouver Island.—The work in connection with the construction of the ferry dock and terminals at Patricia Bay, near Victoria, is being proceeded with. A temporary wharf has been erected for the landing of rails and supplies. About 80% of the line between Victoria and Patricia Bay has been completed, and it is expected to have it finished Dec. 31. (Nov., pg. 503.)

Railway Finance, Meetings, Etc.

Canadian Pacific Ry.—At a meeting of directors, Nov. 9, a dividend of 2½% on the common stock for the quarter ended Sept. 30 was declared, being at the rate of 7% per annum from revenue and 3% per annum from special income account, payable on Jan. 2, 1915, to shareholders of record on Dec. 1.

Grand Trunk Pacific Ry.—A mortgage, dated June 29, 1914, made between the G.T. Pacific Saskatchewan Ry., the Royal Trust Co., and the Saskatchewan Minister of Railways, securing an issue of 4½% sterling terminal bonds, guaranteed by the province, was filed with the Provincial Secretary at Regina, Nov. 6.

Grand Trunk Pacific Branch Lines.—There has been deposited with the Secretary of State at Ottawa a mortgage deed dated June 5, made between the company, the Royal Trust Co., and the Province of Saskatchewan, secuirng an issue of 4½% sterling terminal bonds. The proceeds are to be used for the construction of terminal facilities at Regina, Saskatoon, and other points in Saskatchewan. The bonds are guaranteed, both as to principal and interest by the province.

Lake Erie and Northern Ry.—A meeting of shareholders will be held at Montreal, Dec. 7, to decide upon the raising of funds for the completion of the railway, by the issue of bonds, and to approve of the form of mortgage to be given to secure the payment of the same.

Ottawa and New York Ry.—The Dominion Parliament is being asked to authorize the company to lease its line to the New York Central and Hudson River Ry.

St. Lawrence and Adirondack Ry.—Application is being made to the Dominion Parliament for authority to lease the company's line to the New York Central and Hudson River Ry.

Southampton Ry.—Application is being made to the Board of Railway Commissioners for a recommendation to the Governor in Council, approving of the leasing of its railway in New Brunswick to the C.P.R.

The Temiscouata Ry. Bondholders' Committee, Ltd., give notice that the railway company has decided to pay interest at the rate of 1¼% for the year ended June 30 on the consolidated mortgage income bonds, payment to be made on or before Dec. 31. The actual date of payment has been left indefinite on account of the present conditions of exchange, but so soon as the date is fixed and the committee have received the dividend on the consolidated mortgage income bonds which they hold a similar payment will be made on the committee's provisional certificates, notice of which will be advertised and sent to the certificate holders.

Timiskaming and Northern Ontario Ry.—The net return from the operation of this railway, owned by the Ontario Government, for the financial year ended recently is $250,000, practically the same as for the previous year. The capital investment in the undertaking is reported as $19,000,000, and the annual interest charges $700,000; there is, therefore, a deficit of about $450,000 for the year.

Toronto, Hamilton, and Buffalo Ry.—A meeting of the shareholders was held at Hamilton, Ont., Nov. 11, when the agreement for taking over the Erie and Ontario Ry., now under construction to Dunnville, Ont., was approved. The shareholders of the latter company also met and approved of the agreement. Application will be made to the Board of Railway Commisioners, Dec. 15 for a recommendation to the Governor in Council to ratify teh agreement.

Large Holders of Bank Stocks.—Among the 45 persons who each hold $100,000 or more, par value, in one of the Canadian chartered banks are the following who are connected with transportation interests in some way or other: R. B. Angus, director C.P.R., Montreal, $100,000, Bank of Montreal; Sir Montagu Allan, Montreal, $175,000, Merchants Bank; estate of the late Senator Gibson, Beamsville, Ont., $100,000, Dominion Bank; C. R. Hosmer, director C.P.R., Montreal, $120,000, Bank of Montreal, $60,000, Merchants Bank, $132,500, Royal Bank; H. S. Holt, director C.P.R., Montreal, $210,000, Royal Bank; Senator MacKeen, Halifax, ex-President Halifax Electric Ry., $100,000, Royal Bank; W. D. Matthews, director C.P.R. and President St. Lawrence and Chicago Navigation Co., Toronto, $138,000, Dominion Bank; Sir Edmund Osler, director C.P.R., Toronto, $150,000, Dominion Bank; Sir Henry Pellatt, director Toronto Ry., Toronto, $228,500, Home Bank, in trust; estate of late Sir Robert Reid, formerly President Reid Newfoundland Co., Montreal, $216,000, Bank of Montreal; estate of late James Ross, Montreal, $111,100, Bank of Montreal; estate of late Lord Strathcona, $277,700, Bank of Montreal; W. J. Sheppard, ex-President Northern Navigation Co., Waubaushene, Ont., $100,000, Royal Bank.

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NOTICE TO ADVERTISERS.

ADVERTISING RATES furnished on application.

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A Section of the Alberta Railway Act Declared Invalid.

The Imperial Privy Council's Judicial Committee has declared one of the sections of the Alberta Railway Act to be ultra vires. The act (statutes of 1907, chap 8), provided in Sec. 82, as follows:—

"82. The company may take possession of, use or occupy any lands belonging to any other railway company, use and enjoy the whole or any portion of the right of way, tracks, terminals, stations or station grounds of any other railway company and have and exercise full right and powers to run and operate its trains over and upon any portion or portions of the railway of any other railway company, subject always to the approval of the Lieutenant Governor in Council first obtained or to any order or direction which the Lieutenant Governor in Council may make in regard to the exercise, enjoyment or restriction of such powers or privileges.

"(2) Such approval may be given upon application and notice and after hearing the Lieutenant Governor in Council may make such order, give such directions and impose such conditions or duties upon either party as to the said Lieutenant Governor in Council may appear just or desirable, having due regard for the public and all proper interests and all provisions of the law at any time applicable to the taking of land and their valuation and the compensation therefor and appeals from awards thereon shall apply to such lands and in cases under this section where it becomes necessary for the company to obtain the approval of the Board of Railway Commissioners for Canada it shall do so in addition to otherwise complying with this section."

In the session of 1912, an amending act (chap. 7), was passed, providing in Sec. 7 to add to section 82 of the act of 1907, quoted above, as follows:—

"(3) The provisions of this section shall extend and apply to the lands of every railway company or person having authority to construct or operate a railway otherwise than under the legislative authority of the Province of Alberta in so far as the taking of such lands does not unreasonably interfere with the construction and operation of the railway or railways constructed and operated or being constructed and operated by virtue of or under such other legislative authority."

The Canadian Privy Council decided on Jan. 4, 1913, that certain questions in connection with the Province's right to enact the section quoted above should be submitted to the Supreme Court of Canada, pursuant to the Supreme Court Act, Sec. 60. The question came before the Supreme Court in Feb., 1913, and the court decided that it was not competent to the Alberta Legislature to enact legislation authorizing the construction and operation of railways in such a manner as to interfere with the physical structure or with the operation of railways subject to the jurisdiction of the Dominion Parliament of Canada. Judge Brodeur dissented, being of the opinion that such legislation would be within the jurisdiction of the provincial legislature provided that in its effect there should be no unreasonable interference with Dominion railways.

The Province then appealed to the Imperial Privy Council's Judicial Committee which, on Oct. 22, upheld the Supreme Court of Canada's decision. Lord Shaw, who delivered their Lordships' judgment for Lord Moulton, said railways such as were described in the British North America Act, Sec. 92, came under the exclusive authority of the Dominion Parliament. The provincial legislature, therefore, had no power to effect by legislation the line or works of such a railway, and their Lordships had no hesitation in pronouncing that the act in dispute was ultra vires of the Alberta Legislature. Their Lordships were of opinion that the decision appealed from was correct. They would accordingly advise His Majesty that the appeal should be dismissed, but without costs.

Nominations for Officers of Canadian Society of Civil Engineers.

The following have been nominated for officers and members of council for 1915: For President, F. C. Gamble, Chief Engineer, Public Works Department, Victoria, B.C.; for Vice President for 3 years, A. E. Doucet, District Engineer, National Transcontinental Ry., Quebec; A. St. Laurent, Public Works Department, Ottawa. For Vice President for 1 year, E. E. Brydone-Jack, Professor of Civil Engineering, Manitoba University; Gordon Grant, Chief Engineer, National Transcontinental Ry., Ottawa.

For councillors, District 1, S. P. Brown, Chief Engineer, Montreal Tunnel, etc., Canadian Northern Ry.; H. R. Safford, Chief Engineer, G.T.R.; A. Surveyer, Montreal; R. M. Wilson, Montreal. District 2, C. B. Brown, Chief Engineer, Canadian Government Railways, Moncton, N.B.; F. W. W. Doane, City Engineer, Halifax, N.S. District 3, A. Amos, Quebec; T. A. J. Forrester, Quebec. District 4, G. J. Desbarats, Deputy Minister Naval Service, Ottawa; A. J. Grant, Superintending Engineer, Trent Canal, Peterborough, Ont. District 5, S. B. Clement, Chief Engineer, T. & N.O. Ry., North Bay, Ont.; J. L. Weller, Engineer in Charge, Welland Ship Canal, St. Catharines, Ont. District 6, W. G. Chace, Winnipeg; F. H. Peters, Calgary, Alta. District 7, N. J. Ker, Vancouver; D. O. Lewis, District Engineer, Canadian Northern Pacific Ry., Victoria, B.C.

Harmony of Farming and Transportation Interests in the Northwest.

Representatives of the Grain rGowers' Association of Manitoba and Saskatchewan, the United Farmers of Alberta, and the Canadian Manufacturers' Association met in Winnipeg early in November to consider a number of matters of mutual interest. An authorized statement handed to the press, summarizing the results of the conference, contained the following references to transportation matters:

"Another of the needs is for better and cheaper transportation from the farm to the ultimate market. Embraced under this heading are the problems of good roads, of shipping and receiving facilities, and of rail and water rates. To arrive at an intelligent understanding of any of these would call for weeks of careful study; to devise and to apply the proper remedy would be a matter perhaps of years. Again the question arises, Who is to do it, and how is it to be financed?

"In this connection it is but fitting that we should acknowledge with gratefulness the generous spirit with which the railway companies have responded to appeals for relief in specific instances. With their help many a difficult situation has been successfully tided over, and we trust that friendly co-operation may long continue to characterize the relations of farming and transportation interests."

It is dangerous to forge high speed steel after the temperature has dropped below a bright yellow.

Birthdays of Transportation Men in December.

Many happy returns of the day to:—

E. T. Agate, M. Can. Soc. C. E., District Engineer, Canadian Northern Ontario Ry., Sudbury-Port Arthur Line, Sudbury, born at Pittsford, N. Y., Dec. 7, 1874.

J. H. Barber, M. Can. Soc. C. E., Engineering Department, C.P.R., Montreal, horn at Cobourg, Ont., Dec. 20, 1856.

H. E. Bissell, Right of Way and Claims Agent, Grand Trunk Pacific Ry., Winnipeg, born near Noyan, Que., Dec. 31, 1867.

G. Blackbird, Locomotive Foreman, G.T. R., Richmond, Que., born at East Dereham, Norfolk, Eng., Dec. 23, 1849.

N. E. Brooks, M. Can. Soc. C. E., Engineer of Maintenance of Way, Western Lines, C.P.R., Winnipeg, born at Sherbrooke, Que., Dec. 25, 1866.

Harold Browning, steamship agent, etc., Windsor, Ont., born at Stamford, Lincolnshire, Eng., Dec. 2, 1864.

T. C. Burpee, M. Can. Soc. C. E., ex Superintending Engineer, Canadian Government Railways, now of Edmundston, N.B., born at Sheffield, N.B., Dec. 11, 1852.

W. W. Butler, Vice President, Canadian Car and Foundry Co., Montreal, born at Danville, Ohio, Dec. 9, 1862.

M. M. Campbell, Building Inspector, G. T. R., Montreal, born at Bridgeton, N. B., Dec. 17, 1879.

W. C. Casey, General Agent, Passenger Department, Atlantic Steamship Lines, C. P. R., Winnipeg, born at Moncton, N. B., Dec. 12, 1882.

H. Foster Chaffee, ex Passenger Tr ffic Manager, Canada Steamship Lines, Ltd., born at Knowlton, Que., Dec. 18, 1868.

A. H. Chave, Purchasing Agent and Assistant to First Vice President, Canadian Car and Foundry Co., Montreal, born at Williamsbridge, N. Y., Dec. 26, 1872.

W. H. Gardiner, City Freight Agent, C. P. R., and District Freight Agent, Esquimalt and Nanaimo Ry., Victoria, B. C., born there Dec. 6, 1859.

H. H. Gildersleeve,, Manager, Northern Navigation Co., Sarnia, Ont., born at Kingston, Ont., Dec. 15, 1865.

A. S. Goodeve, member Board of Railway Commissioners for Canada, born at Guelph, Ont., Dec. 15, 1860.

A. J. Gorrie, ex-General Superintendent, Canadian Northern Quebec Ry., Quebec, born at Raith, Kirkcaldy, Scotland, Dec. 10, 1868.

W. H. Grant, Manager of Construction, Mackenzie, Mann and Co., Ltd., Toronto, born at Acton, Ont., Dec. 8, 1858.

F. P. Gutelius, M. Can. Soc. C. E., General Manager, Canadian Government Railways, Moncton, N. B., born at Mifflinburg, Pa., Dec. 21, 1864.

D. B. Hanna, Third Vice President, Canadian Northern Ry., Toronto, born at Thornliebank, Scotland, Dec. 20, 1858.

J. J. Hennigar, General Agent, Canada Steamship Lines, Ltd., Hamilton, Ont., born at Topeka, Kan., Dec. 21, 1884.

G. Hiam, District Freight Agent, C. P. R., Fort William, Ont., born at Montreal, Dec. 14, 1888.

E. W. Holton, General Passenger Agent, Northern Navigation Co., Sarnia, Ont., horn at Belleville, Ont., Dec. 15, 1872.

S. P. Howard, ex-General Freight Agent, Eastern and Lake Superior Divisions, C. P. R., Montreal, born there, Dec. 30, 1865.

A. J. Isbester, Assistant District Engineer, Port Arthur District, Canadian Northern Ry., Port Arthur, Ont., born at Ottawa, Dec. 18, 1879.

R. Johnson, Night Locomotive Foreman, C.P.R., Sortin Yard, Montreal, born at Quebec, Que., Dec. 24, 1863.

S. R. Joyce, Travelling Passenger Agent, G. T. R., Toronto, born at Napanee, Ont., Dec. 15, 1887.

J. T. McGrath, ex-Superintendent of Motive Power and Equipment, Chicago and Alton Rd., Bloomington, Ill., born at Toronto, Dec. 6, 1869.

A. T. McKean, City Freight Agent, C. P. R., Winnipeg, born at St. John, N. B., Dec. 18, 1886.

A. E. Macdonald, General Claims Agent, Canadian Northern Ry., Winnipeg, born at Woolwich, Eng., Dec. 11, 1870.

L. Macdonald, Division Freight Agent, G. T. R., Toronto, born at Montreal, Dec. 10, 1871.

A. D. MacTier, General Manager, Eastern Lines, C. P. R., Montreal, born at Blairgowrie, Scotland, Dec. 27, 1867.

A. Price, Assistant General Manager, Eastern Lines, C. P. R., Montreal, born at Toronto, Dec. 6, 1861.

G. D. Robinson, Assistant Export and Import Freight Agent, C. P. R., Toronto, born at St. John, N. B., Dec. 7, 1877.

Collingwood Schreiber, C.M.G., Hon. Mem. Can. Soc. C. E., General Consulting Engineer to Dominion Government, Ottawa, Ont., born at Bradwell, Essex, Eng., Dec. 14, 1831.

F. P. Smith, Secretary, Canada Steamship Lines, Ltd., Montreal, born there, Dec. 23, 1873.

C. E. E. Ussher, Passenger Traffic Manager, C. P. R., Montreal, born at Niagara Falls, Ont., Dec. 29, 1857.

H. H. Vaughan, M. Can. Soc. C. E., Assistant to Vice President, C. P. R., Montreal, horn at Forest Hill, Essex, Eng., Dec. 26, 1868.

R. C. Vaughan, Assistant to Third Vice President, Canadian Northern Ry., Toronto, born there, Dec. 1, 1883.

A. P. Walker, M. Can. Soc. C. E., Divlsion Surveyor, Ontario Division, C. P. R., Toronto, born at West Hartlepool, Eng., Dec. 9, 1860.

E. H. Wood, Division Car Foreman, Ontario Division, C. P. R., Toronto, born at St. John, N. B., Dec. 30, 1880.

National Transcontinental Railway Construction.

We were officially advised, Nov. 17, that the Intercolonial Ry. expected to begin operating the entire section of the National Transcontinental Ry. between Moncton, N B., and St. Jean Chrysostome, Que., the point of junction with the Intercolonial near Levis, Nov. 23. The distance is 457.7 miles.

The service previously given extended from Moncton to St. Eleuthere, Que., 290.8 miles. No definite arrangements have been made for the operation of any other part of the line, except as at present. It is expected, however, that arrangements for the permanent operation of the whole line will be concluded at an early date.

Tenders are under consideration for the supply of boilers and stokers, feed water heater, steam engines and stokers, generators, switchboard and wiring, at the Leonard shops, St. Malo, Que.

Tenders will be received to Dec. 8 for the supply of 150,000 ties, to he delivered at Belair and La Tuque, Que. (Nov., pg. 501.)

Railway Lands Patented.—Letters patent were issued during September in respect of Dominion railway lands in Manitoba, Saskatchewan, Alberta, and British Columbia, as follows:

Calgary and Edmonton Ry.....	1,116.00
Qu'Appelle, Long Lake and Saskatchewan Rd. and Steamboat Co.....	1,905.90
Total	3,021.90

Grand Trunk Pacific Railway Construction.

M. Donaldson, Vice President and General Manager, returned to Winnipeg, Nov. 2, after having made a full inspection by daylight of the entire main line from Winnipeg to Prince Rupert, and a general inspection of the branch lines in operation and under construction. Speaking of the main line construction he is reported to have said that the final lift of ballast on the 125 miles west of Fort George was expected to be completed by Nov. 15. The only work to be done on the main line was the completion of the terminal buildings at Fort George, Endako, Smithers and Pacific.

It was officially announced in Winnipeg, Oct. 29, that a contract had been let to Carter, Halls and Aldinger, Winnipeg, for the erection of terminal buildings at Fort George, Endako, Smithers and Pacific, B.C., at a total cost of $300,000. Reference was made to the reported letting of this contract in our last issue. The locomotive houses will have 12 stalls each, and the buildings at each place will include a machine shop, boiler house and coal plant, etc. Work has been started at the several points, and it is expected to have all the buildings completed by May 1, 1915.

It is proposed to use a number of oil burning locomotives on the line in British Columbia. For the storage of oil the Imperial Oil Co. is building a storage plant having a capacity of 150,000 gallons at Prince Rupert, and the G.T.P.R. is arranging for the building of storage plants at different points along the line as far east as Jasper Park.

Construction on the dry dock and the shipbuilding plant at Prince Rupert is being pushed forward. Two of the dry dock pontoons are in position, and five more are expected to be launched by Dec. 31. There are to be 12 pontoons in all, and the completed dock will lift a 20,000 ton steamer. The shipbuilding and repair plant is practically completed, as also are the wharves and docks. The whole work is expected to be completed by the end of 1915.

A Seattle, Wash., press dispatch, Nov. 12, states that plans for the new docks there are complete; that some preliminary construction work will be started Jan. 1, 1915, and that tenders for the main work will be asked for hy Jan. 31. The dispatch gives the following particulars of the work to be done: The new dock house will be a two story, slow burning frame structure, with a timber frame, sheathed in sheet iron. The waiting room will be on the Railroad Ave. end of the structure and not at the face of the pier, as in the burned building. It will be covered by a dome similar to that on the Coleman dock house. The new dock house will be plain. There will be no tower as on the old dock. A balcony will be provided for each side of the building. (Nov., pg. 501.)

The C.P.R. and Winnipeg Water Supply.—The Winnipeg City Council is said to have practically "found" $200,000 by a resolution passed by the C.P.R. directors in 1907 being turned up. By this resolution the C.P.R. agreed to pay the city $200,000 in 10 annual instalments, when the city took steps to acquire a permanent water supply. It was resolved at a council meeting recently that the C.P.R. be now asked to pay $20,000, the first annual instalment of the $200,000 promised. The only provision attached to the grant is that the supply must meet the approval of the company's engineers and a certain amount of progress must also have been made before the payment of any instalment.

Electric Railway Department

Ontario Railway and Municipal Board Order Re Toronto Railway.

The report to the Ontario Railway and Municipal Board on a survey of traffic requirements in Toronto and service furnished by the Toronto Ry., made by C. R. Barnes, assisted by J. H. Cain and J. M. Campbell, and which was summarized in Canadian Railway and Marine World for July, was taken up by the Board during October and the early part of November at several hearings, at which numerous witnesses were examined. On Nov. 9 the Board's opinion was announced as follows:—

This application was launched in Nov., 1911, and sets out in detail a list of alleged defaults of the respondent, and of defects in its street railway service in Toronto, having regard to the agreement between the parties hereto, and claims a remedy appropriate to each. These allegations and claims may be summarized as follows:—The refusal of the respondent to issue to passengers requesting them transfers from cars operating on one route to cars operating on another route, and asking an order directing the respondent to issue such transfers. The failure of the respondent to operate its cars on the Dundas St. route to the west limit of Keele St., and asking an order directing the respondent so to operate such cars. The failure of the respondent to operate its cars on the Queen St. route northerly along Roncesvalles Ave., and asking an order directing the respondent to operate all such cars along Roncesvalles Ave. to the Y at Humberside, and returning down Roncesvalles Ave. to Queen St. The failure of the respondent to operate its cars on the Church St. route to and around the Union Station, and asking an order directing the respondent so to operate such cars. The failure of the respondent to operate a sufficient number of cars, in consequence of which the cars operated are greatly overcrowded, and asking an order directing the respondent to operate 200 more cars. That the respondent withdraws its cars from operation too early during the hours when traffic is heaviest, and asking an order directing the respondent to continue to operate all cars in special service during such rush hours till 9 a.m. and till 7 p.m. That the respondent did improperly Y certain of its cars operated on the Bathurst St. route at Dupont St., and asking an order directing the respondent to Y all such cars at Christie St. That the respondent did improperly Y certain cars operated on the Parliament St. route at Pape Ave., and asking an order directing the respondent to Y all such cars at Greenwoods Ave. The failure of the respondent to operate all the cars on the King St. route to the easterly terminus of that route, and asking an order directing all such cars to be operated to said terminus.

After a number of sittings for taking evidence, the hearing of the application was adjourned on Feb. 20, 1912, in order that the applicant might procure a report from a traffic expert upon street railway transportation in Toronto, with suggestions for its improvement. Bion J. Arnold, of Chicago, was employed by the city, and submitted a report, Oct. 25, 1912, which was put in as evidence in support of the application. This report, in the traction improvement and development of the Toronto metropolitan district, contained a number of recommendations for the improvement of the street railway service in Toronto, and as a result the city's application was in effect enlarged, and in addition to the claims made in the original application, the city asked for an extension of the respondent's tracks and service along a number of specified streets, and for a rerouting of a number of the car services. Both parties subsequently submitted evidence bearing both upon the claims made in the original application, and those suggested by the recommendations contained in Mr. Arnold's report. In view of the fact that that report was based upon a survey of the requirements of the so called Toronto metropolitan district, which embraces areas in respect of which this Board has no jurisdiction upon this application, and in view further of the fact that the matters under enquiry required for their determination technical knowledge, and an experience to be gained only by long familiarity with street railway transportation problems in large cities, and their solution so far as they have been found susceptible of solution under present day conditions, the Board decided to procure the services of an independent expert adviser. C. R. Barnes was accordingly retained by the Board, he having had some 20 years experience as Electric Railway Expert on the Public Service Commission of New York State, investigating methods of construction, equipment and operation of electric street railways. Mr. Barnes presented his report to the Board, dated May 15, 1914, in which, after a comprehensive and detailed survey of the company's equipment and operation in its various departments, he made certain recommendations for the improvement of the service. These recommendations fall naturally into three groups, dealing respectively with:—Track extension and reconstruction; additions and improvements to rolling stock; improved methods of operation.

The expenditure involved in a compliance with these recommendations was estimated by Mr. Barnes at $2,950,000. The concluding paragraph of the report reads:—"Discussion of terms of franchise, contracts and protection of investment, has been intentionally omitted from this report, as it is considered that these matters do not properly come within the scope of this investigation." In this, no doubt, Mr. Barnes acted wisely, as he was concerned only in suggesting those physical changes and additions which, in his judgment, were necessary to bring the equipment and service up to the standard of completeness and efficiency which he had in mind. Obviously, however, those matters which Mr. Barnes properly excluded from his consideration cannot be overlooked by the Board, when expenditure of nearly $3,000,000 is in contemplation, and the suggestion is made that a large part of the company's equipment, still capable of rendering service, should be compulsorily retired and virtually scrapped. In particular it must be borne in mind that of the company's franchise period of 30 years, less than 7 years remain to run, and that the unexpired term of the franchise, and the earning power which it represents, are an important, if not the chief asset, of the company in financing so large an expenditure.

Another and recent development which cannot be overlooked by the Board is the fact that the company's revenues have shown a serious falling off for the last three months. The commencement of this decline is coincident with the outbreak of hostilities in Europe, and in view of the widespread trade disturbance caused by the onset of war, the shrinkage of the company's receipts may well have been occasioned by it. To what extent this falling off is due to the inevitable reaction after a period of expansion and overtrading, it is impossible to determine—equally conjectural is the probable duration of the period of depression on which we have entered. This is certain, that since early in August the company's receipts have fallen off, on an average, $1,000 a day. So serious a factor in the problem, affecting as it does the company's ability to assume new financial burdens, must not be lost sight of. Besides, the depletion of revenue evidences a falling off in the volume of travel, and therefore a probable proportionate relief of the chief grievance, to remedy which the application was launched—overcrowding.

At the hearing on Oct. 21 last, the attention of Mr. Barnes, when under examination, was called to this decline in revenue, and he was questioned as to it and its effect by Mr. Osler, and in reply said, "I would not make this report, and these recommendations, under existing conditions?"

Mr. Barnes replied:—"I would like to explain that answer; the report was based upon the condition of traffic which at that time had been reached by progressive increases from year to year, and on the assumption that these increases would be continued."

Mr. Barnes was then questioned as to whether consideration should be given to the fact that, owing to a general depression, the company's revenues were declining, combined with the fact that its franchise period was nearing an end. He was asked:—"Having regard to the financial conditions which you know to exist, and to the franchise condition of this company, and having regard to these changed conditions which we have been speaking of up to the present time, do you think that it is now reasonable—and having regard to the large number of cars which you can see the company has been putting on—do you think it is reasonable to ask the company to undertake capital expenditures at the present time?" He answered: "I can repeat what I said before—that the recommendations were based upon a condition of traffic which necessitated improvement in the service, the changed conditions relieve to the extent of the change the necessity for improvement which is self-evident. On the question of franchise, the report states that I did not take that into consideration. The decreased earnings as shown by these statements submitted in this city, and the decreased earnings which I know are taking place in the State of New York, would make the time inappropriate to require companies to make capital expenditure, and companies should be permitted to curtail operating expenses to the lowest possible point consistent with reasonable service. On the question of the short term of the franchise, based on my experience in railway affairs, I would say that the company could not be equitably requested to make the capital expenditures necessary by the recommendations, unless some arrangement for reimbursement was made at the expiration of the franchise."

Before indicating the board's conclusions upon the matter of claim still undisposed of,

it seems proper to enumerate those which from time to time, during the pending of the application, have been dealt with or satisfactorily settled, either by interim order of the board or by the company on its own initiative, or at the suggestion of the board without a formal order. A consideration of these will show that in the result many grievances complained of have been redressed in virtue of additions to the company's equipment, or changes in its mode of operation. By an order dated Dec. 11, 1911, the company was directed to adopt the system of practically universal transfers now in vogue. By the same order the company was directed to continue the Dundas St. service to the end of the line to Keele St., and to operate the Queen St. cars along Roncesvalles Ave. as far as Boustead Ave. The cars on the Church St. route are now operated to and around the Union Station, as sought by the city in its application. The cars on the Bathurst St. route now Y at Christie St., instead of at Dupont St., as formerly. The cars on the Parliament St. route now Y at Greenwoods Ave., instead of at Pape Ave., as formerly. All the cars on the King St. route are now run to the eastern extremity of the company's track on that street, instead of as formerly being in some cases Y'd at Woodbine Ave. or Scarboro Park, or being run into the King St. barns. A new track was laid at Louisa St., between Teraulay and Yonge Sts. By an order dated Oct. 3, 1913, the company and city were directed to do all things necessary on the part of each of them to complete and make ready for operation the company's railway along Teraulay St., from Queen St. to Agnes St., and thence westerly along Agnes, Anderson, and St. Patrick Sts. to Bathurst St. During 1912 and 1913 200 new cars, being the number of additional cars asked for in the city's original application, were added to the company's equipment, as follows: In 1912 the company put in service 50 double truck and 50 single truck convertible cars, and during 1913 75 double truck and 25 single truck cars, and during 1914 1 double truck convertible car, and during the above periods none of the company's cars were withdrawn from service.

The conclusions reached by the board for the improvement of the company's service, and which may be incorporated in a formal order, are the following: That before Jan. 1, 1915, the company reconstruct 13.45 miles of track classified as in poor condition by Mr. Barnes; that before June 1, 1915, the company extend its tracks, with all necessary overhead work, pursuant to plans and specications to be approved by the board, from their northerly terminus on Ossington Ave. at Bloor St., northerly along Ossington Ave. to and along Hallam St., to Dufferin Ave., thence along Dufferin Ave. to Lappin St., and thence along Lappin St. to Lansdowne Ave., and do along such extension operate cars according to a schedule approved by the board. That before Dec. 1, 1914, the company do extend it stracks with the necessary overhead work, pursuant to plans and specifications to be approved by the board, along Teraulay St., from its tracks on College St. southerly to a junction with its tracks at the corner of Teraulay and Agnes Sts., and do operate its cars thereon according to a schedule to be approved by the board. That upon Jan. 1, 1915, the company place metal troughs of an approved type on the trolley wire where it is carried over steam railway tracks. That the company before Jan. 15, 1915, reconstruct the platform and steps of 34 of the cars referred to in recommendation 15 of Mr. Barnes' report, and as more fully detailed upon pg. 165 thereof; and report to the board upon the feasibility of reconstructing the remainder of the 202 cars referred to in recommendation 15, together with the cost of such reconstruction. That the company build and have in operation upon routes approved by the board, no later than June 1, 1915, 50 double truck motor cars of a design approved by the board. That on or before May 1, 1915, the company equip each of its cars with a legible route sign on the right hand side, and a destination sign at the front end, both signs to be suitably illuminated during the hours of darkness. That cars constructed by the company in future shall be equipped with push buttons. That the company report to the board not later than Jan. 15, 1915, on an improved heating system for its cars and the cost of the same. That during the summer months and during the hours of congested travel in other months all the College Street cars going west be run along Howard Park Avenue and around the High Pork loop, but that only each alternate car at other times be run along Howard Park Ave. and around the High Park loop. That the company report to the board not later than Jan. 15, 1915, on the practicability of the rerouting proposed in recommendation 9 of Mr. Barnes' report. That the company report to the board not later than Jan. 15, 1915, on the operation of its cars at the points mentioned on pages 50 and 51 of Mr. Barnes' report, with a view to preventing unnecessary delays. That the company not later than Jan. 15, 1915, submit to the board a draft bylaw dealing with the several matters referred to in recommendation 7 of Mr Barnes' report.

The board has already disposed of the application for an order to extend the Bloor St. line from Lansdowne Ave. to the north eastern corner of High Park, on the ground that, by reason of the company's abandonmen of its charter, the board has no jurisdiction to make such an order.

The board is of the opinion that the Wilton Ave. line should be extended to Danforth Ave., as recommended in Mr. Barnes' report, but no such order will be made until the subways under the steam railways are constructed and the new streets being opened up by the city are put in condition to receive the tracks.

The board is of the opinion that the extension of the company's tracks along Ossington Ave., Hallam, and Lappin Sts., hereby ordered, should be extended westerly from Lansdowne Ave. to Dundas St., but no order for such further extension can be made until subways are constructed under the steam railway tracks.

The board orders that the cost of procuring and having printed Mr. Barnes' report, $9,960.32, be borne equally by the parties hereto, and that each of the parties pay to the board in law stamps $100.

The Savings of Electric Traction over steam on the Butte, Anaconda & Pacific Ry. were reported at a meeting of the American Institute of Electrical Engineers in Spokane recently by J. B. Cox. The number of trains had decreased 25% but 35% more tonnage was hauled per train. Repairs had dropped 26% and locomotive house expenses 38%. For energy alone $150,727 was saved. The reduction in trainmen's wages was $31,146. The total cost of conversion to electric traction was $1,201,000, making the total savings some 20% on the cost.

Electric Traction in Montreal.—The Maisonneuve, Que., City Council has passed a resolution favoring application to the Board of Railway Commissioners for an order to compel the use of electric locomotives within the city limits. The City Councils of Montreal, Westmount and Outremont have been asked to join in the application.

Electric Railway Finance, Meetings, Etc.

British Columbia Electric Ry. and allied companies.—Gross earnings for September, $650,516; operating expenses, maintenance, etc., $509,626; net earnings, $140,890, against $734,283 gross earnings; $560,888 operating expenses, maintenance, etc.; $173,395 net earnings for Sept., 1913. Aggregate gross earnings for three months ended Sept. 30, $2,015,351; net earnings, $466,547, against $2,260,854 aggregate gross earnings; $583,478 net earnings, for same period 1913.

Calgary Municipal Ry.—A Calgary, Alta., press report says: There were 404,201 less fares collected by Calgary Municipal Ry. in Sept., 1914, than in Sept., 1913. The deficit for the nine months ended with September is about $60,000. It was about $54,000 up to Aug. 31. The measures that have been taken to cut down the expenses of the system are not yet showing much effect. It was late in September before drastic action along this line was taken. The balance of revenue operating expenses for September was $14,881.01. This balance, however, is not large enough to care for the extra charges, such as sinking fund, interest on debentures and depreciation. That is where the deficit comes in. The revenue for Sept., 1914, was $51,190.70, and for Sept., 1913, $62,519.18. The operating expenses for Sept., 1914, were $36,309.69, and for Sept., 1913, $46,361.21. The number of passengers carried in Sept., 1914, was 1,077,353, and in Sept., 1913, it was 1,481,554.

Cape Breton Electric Company is reported to have sold $25,000 of its $130,000 5% bonds authorized by the Public Utilitles Commission recently at 88. At the time of the application to the Commission for the required permission it was stated that the proceeds of the bonds were to be used to liquidate expenditures on capital account, and that the bonds also were to be used as collateral security for advances from banks. The company's head office is in Boston, and its railway operates in the Sydneys and Glace Bay and between those places.

Gross earnings for September, $27,733; operating expenses and taxes, $17,816.77; net earnings, $9,956.23; interest charges, $5,206.50; balance, $4,749.73; bond sinking and improvement funds, $1,190; net balance for reserves, depreciation, etc., $3,559.73, against $32,515.62 gross earnings; $16,955.73 operating expenses, taxes, etc.; $15,559.89 net earnings; $4,891.66 interest charges; $10,668.23 balance; $1,190 bond sinking and improvement funds; $9,478.23 net balance for reserves, depreciation, etc., for Sept., 1913. Aggregate gross earnings for nine months ended Sept. 30, $260,714.91; net earnings, $105,579.24; interest, bond sinking and improvement funds, $58,426.40; net balance, $48,514.82, against $271,728.42 aggregate gross earnings; $115,407.56 net earnings; $54,816.15 interest, bond sinking and improvement funds; $60,591.31 net balance for same period, 1913.

Dominion Power and Transmission Co.—A Hamilton, Ont., press despatch says the directors have declared a dividend of 2% on the $5,100,000 of limited preference shares, payable Dec. 15 to shareholders of record Nov. 30. This makes the second dividend of this amount paid during this year, bringing the total payments to date to 7½%. When the dividends total 10% the limited preference stock will become common stock, of which $2,614,500 is now outstanding. It is generally thought that the remaining payment of 2½% will be made next June, if all goes well.

Hamilton St. Ry. receipts for the third quarter of 1914 decreased $31,319 from the corresponding period of 1913.

London St. Ry.—Gross earnings for nine months ended Sept. 30, $282,192.46; expenses, $200,033.84; net earnings, $82,188.62.

London and Lake Erie Ry. and Transportation Co.—A mortgage deed made between the company and the Fidelity Trust Co. of Ontario, dated Oct. 1, has been deposited with the Secretary of State at Ottawa.

Montreal and Southern Counties Ry.—The officers and directors for the current year are:—President E. J. Chamberlin; Vice President and Treasurer, Frank Scott; Secretary, J. A. Yates; Comptroller, W. H. Ardley; other director, W. H. Biggar, K.C. The General Manager is W. B. Powell.

Toronto Ry., Toronto and York Radial Ry., and allied companies.—Gross earnings for September, $879,321; operating expenses, maintenance, etc., $430,095; net earnings, $449,226, against $865,796 gross earnings; $411,159 operating expenses, maintenance, etc.; $454,637 net earnings for Sept., 1913 Aggregate gross earnings for nine months ended Sept. 30, $7,622,107; net earnings, $3,714,653, against $7,183,470 aggregate gross earnings; $3,553,004 net earnings for same period 1913.

The Toronto Ry. receipts for October were $487,689.05, against $519,274.03 for Oct., 1913. The percentage paid to the city was, for Oct., $39,274.20, against $42,924.59 for Oct., 1913.

Winnipeg Electric Ry.—Gross earnings for September, $310,996; operating expenses, $185,977; net earnings, $125,019, against $331,732 gross earnings; $181,652 operating expenses; $150,080 net earnings for Sept., 1913. Aggregate gross earnings for nine months ended Sept. 30, $3,071,940; net earnings $1,290,310, against $2,981,434 aggregate gross earnings; $1,336,374 net earnings for same period 1913.

Edmonton Municipal Railway's Financial Difficulties.

Commissioner Harrison presented a report to the Edmonton, Alberta, City Council recently, on the Edmonton Municipal Ry., which said, in part:—"Before the cars start out in the morning, and take in any receipts, the following fixed charges have to be met before a profit can be made for each day:—Interest and sinking fund charges, $650; depreciation, $280; interest on overdraft in bank, $55; total, $985. Operation and maintenance charges:—Wages and salaries per day, $900; power charges, $350; total, $1,250; grand total, $2,335. In other words, before the street railway begins to show a profit it must earn not less than $2,335 a day or must carry at least 47,000 passengers per day to pay expenses. At present the railway is carrying on the average 32,000 passengers a day, and is going behind at the rate of $500 to $800 a day.

"Our system is overcapitalized; we have twice as many miles of track per thousand of population as any other city in the Dominion, and in many instances four times as many miles; in other words, we have extended our system far more rapidly than good business practice would warrant.

"A mere change of officials will not cure the evil, and I have therefore requested the appointment of a committee of the council to examine into street railway matters in order that a careful study may be made of them. Only by a reduction in our operating expenses, by a reduction in our power charges, by our refusal to extend the railway further into non-paying territory; by the elimination of excessive depreciation charges, and by a determined effort through various means to increase the number of passengers carried, through the establishment of amusements, such as skating rinks and amusement parks at the end of the line, may we hope to increase the traffic, and by this means in time overcome the deficit.

"I am thoroughly convinced that if a committee would make a thorough study of the conditions, and receive with open mind suggestions that may be made for the improvement of our system by the Superintendent and others, a solution of our street railway difficulties may be obtained. The difficulties may not be solved all at once, but at present we are losing so much money that unless some decided step is taken there is a grave danger that the confidence of our citizens in the municipally owned street railway will be so shaken that they may even go so far as to consider the disposal of this franchise to a private company. This would be an extreme measure for which there is no need, provided a remedy is applied in connection with the large deficits incurred in operating the system from day to day."

Montreal and Southern Counties Railway Progress.

Nov. 1 was the fifth anniversary of the opening of the M. & S.C. Ry. On Nov. 1, 1909, the first service between McGill St. and the south shore was put into operation. The company then owned 2 passenger cars and these made 28 trips to and from St. Lambert only. Today the company is operating over 40 miles of track and is serving St. Lambert, Montreal, South Longueuil, Greenfield Park, Country Club, Chambly, Richelieu, Marieville, Rougemont and St. Cesaire, making in all 90 trips daily over the Victoria Bridge. In addition it has another 16 miles of track under construction to link up Abbotsford and Granby. In January next work will be begun on the extension of the tracks on the Montreal side as far as Youville Square.

In place of the 2 cars which comprised the railway's rolling stock 5 years ago, there are now 32 passenger cars, 2 baggage cars, 2 flat cars, 2 rotary plows, 1 double track sweeper, and 1 single track sweeper. During the first year 319,778 passengers were carried, while for the fiscal year ended June 30 last, W. B. Powell, the General Manager, reports that the company carried 1,915,379 passengers, against 1,661,245 in 1912-13.

The effect which this line has had on the towns through which it passes is shown by the increased population figures:—

	1909.	1914.
St. Lambert	1,800	5,300
Lougueuil	3,900	5,800
Greenfield Park	500	1,300
Montreal South	664	802

In addition the company has been the means of opening up many new centres of population, including Alexandria Park, Rivera Park, St. Lambert Heights, St. Lambert Annex, Springfield Park, Sunlight City, East Greenfield Park, Pinehurst, Brooklin, Brentwood, South Kensington, Woodbine, Beverl, Albani, Belleville, Tunnel Terminals and Elswick Townsite.—Montreal Mail.

U. S. Coins in Montreal.—It was stated in the daily press recently that the Montreal Tramways Co. was refusing to accept United States coins for fares on its cars. We are officially advised that the report is untrue. In some cases the new nickels will not enter the fare box slots, but when this is the case, exchange is made by the conductor for a Canadian 5c. piece, which may be deposited in the box.

The Quebec Ry. Light, Heat and Power Co.'s employes have contributed $725 to the Quebec Patriotic Fund.

Overcrowding on the Toronto Railway.

At the assizes at Toronto, Nov. 2, the grand jury, on the city's complaint, returned a true bill against the Toronto Ry. Co. for criminal negligence, in endangering the lives, safety, health or comfort of passengers without lawful excuse, each day throughout the year, and unlawfully omitting to take reasonable precautions to avoid such nuisances. A considerable amount of evidence was taken, during with it was, more or less, admitted that at certain times of the day there was a certain amount of overcrowding, which the company was powerless to prevent, and to which the city and the general public contributed.

Chief Justice Falconbridge, in summing up, stated that the facts were not disputed, but that the charges were practically admitted, and that the case was clearly proved, the only matter that remained for the jury was to say to what extent the company was justified. He continued, that the question in point was rather one of palliation than justification, and that the company's claim that the public was responsible for the conditions as they existed was answered by the general law of the land which gave the company the right to use force in preventing overcrowding of the cars, and that when people knew the law the company would have no difficulty in enforcing it. He also stated that the rights of the occupants of a car are superior to those of the persons who had not yet boarded it.

Before agreeing on a verdict of guilty, the jury reported twice that it had failed to come to an agreement, on which the Chief Justice informed them that there was no reason for disagreement, as he had "practically asked for a conviction." Counsel for the company immediately asked for a stated case, the main reason being the charge delivered by the Chief Justice, which was practically an order to the jury to bring in a verdict of guilty. He argued that it was for the jury to consider the evidence. In granting the stated case, the Chief Justice stated that the General Manager admitted that if given power to refuse passengers when the cars were overcrowded, and use force, he would do so. According to a previous judgment in 1911, when the company was found guilty of the same offence, it was plainly stated that the company could use force to stop overcrowding, and the General Manager's evidence was practically an admission of guilt. Sentence was suspended pending the disposition of the stated case in the Court of Appeal.

Rolling Stock for London and Port Stanley Railway.

The London and Port Stanley Ry. Commission has given contracts to the Canadian General Electric Co. for 3 electric locomotives and for the electrical equipment for 5 motor cars, according to the specifications detailed in Canadian Railway and Marine World for November, the contracts approximating $135,000. As stated previously, the locomotives will be 1,000 h.p., with a hauling capacity for a trainload of 1,000 tons. The cars will have a 4 motor electrical equipment of about 600 h.p. per car. The equipment both for the locomotives and cars will be of the latest type, with the latest automatic safety devices.

The motor cars and trailers, of which there will be 5 each, will be of one pattern, and steel construction throughout. Specifications for the car bodies were completed towards the end of November and tenders have been invited up to Dec. 2.

Answers to Questions on Electric Railway Topics.

Following are questions submitted to the American Electric Railway Association's question box, with replies thereto by Canadian electric railway officials:

Paving between branch-off tracks.—Where several branch-offs lead from the main line tracks in the centre of the street to a car barn, how far apart would they have to be in your city before company would not be held responsible for the paving between?

G. Gordon Gale, General Manager Hull Electric Co., Hull, Que.—We are required to pave 12 ft. of roadway with a single track and 18 ft. with a double track. Branch-offs to a car barn would be considered as single tracks, and 3½ ft. on each side of rails would be paved by company.

Oil temperature in oil-cooled bearings.—What is the maximum temperature at which oil in oil-cooled bearings should operate where the oil circulates around the bearings and the water is cooled?

F. G. Clark, Chief Engineer Toronto Ry.—An answer to this question depends almost entirely upon the characteristics of the oil and also to some extent upon the bearing metal used. There is no very satisfactory way of determining the exact temperature of the oil at the bearing surface. It may be many degrees lower temperature half an inch away from the bearing surface, being mixed with other oil of lower temperature, which has been cooled by the circulating water pipes. Satisfactory operation has been obtained where a mixture of oil under similar circumstances has had a temperature of 150 degrees Centigrade.

Sleet on trolley wires.—What has proved the most effective method of combating the effect of sleet on trolley wires; what form of sleet cutter, sleet wheel or other device do you use; what special instructions are given train men for use during sleet storms; how many sleet storms will you average during the winter?

G. Gordon Gale, General Manager, Hull Electric Co., Hull, Que.—Sleet scrapers have proved the most effective. Ours fit into trolley wheel groove and are clamped around end of trolley pole. The portion of the scraper coming in contact with the trolley wire has a number of cutting edges. We have not found the sleet wheel of much use. During sleet seasons all cars carry sleet scrapers. Crews are instructed to place scrapers in position as soon as sleet commences to show interference with operation. We average about a dozen sleet storms during the winter.

F. G. Clark, Chief Engineer, Toronto Ry.—There is no effective method of combatting sleet on trolley wires which does not tend to destroy the trolley wire. No sleet cutter is used. No special instructions with respect to trolley wire are given to train men. We have approximately six sleet storms during the winter.

Weatherproof feed wire.—In ordering weatherproof feed wire do you specify three cotton braids or two jute braids and one cotton; in your opinion which is the best insulation; what variation do you allow in the size of the conductor; what variation do you allow in weight; in stranded wire do you specify annealed copper wire or medium hard drawn?

F. G. Clark, Chief Engineer, Toronto Ry.—We have no standard. I do not know which is the better insulation of the two mentioned. All our specifications for size of conductor state that it is not to be less than ——, and weight is not to be less than ——. We specify stranded wire for long spans, hard drawn. For short spans medium hard drawn, and where extra flexibility is required, as in station cables, it is to be annealed.

Size of axles.—What is the proper size for axles for use with pony wheels on maximum traction trucks when 80% of car weight is on drivers?

W. R. McRae, Master Mechanic, Toronto Ry.—We use 4 in. axles on pony wheels and 4½ in. on drivers of maximum traction trucks. We do not have either broken or sprung axles, since increasing from 3½ in. pony and 4 in. drivers, with which this type of truck was originally equipped. The entire car equipment of this road is given a thorough overhauling once a year, regardless of the type of motor. New equipment is given a provisional overhauling after one year of service, and is given the usual general overhaul after the second year of service. G.E. types 80, 67 and 1,000 are standard on this road.

Curtailment of expenses.—If the mechanical department has radically to curtail expenses, what sub accounts can best be reduced, always considering safety first?

W. R. McRae, Master Mechanic, Toronto Ry.—Not any that I know of without affecting all.

Armature and axle bearings.—What composition is used for armature and axle bearings, and what was cost per 1,000 car miles of Account 36-J, Motor Bearings, for year ended Dec. 31, 1913?

W. R. McRae, Master Mechanic, Toronto Ry.—The composition of armature and motor bearings is as follows:—tin 96 parts, copper 4 parts, antimony 8 parts. Cost of armature bearings per 1,000 car miles is 58c., and of motor axle bearings 21c. This includes inspection, maintenance, lubricants and lubricating.

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—Armature bearings lined with babbitt:—tin 83.3, copper 8.3, antimony 8.3; axle bearings are of brass:—copper 72, lead 20, tin 7, miscellaneous 1. Cost of armature bearings per 1,000 car miles:—labor 7.8c., material 8c., total 15.8c.; cost of axle bearings per 1,000 car miles:—labor 3.8c., material 7.5c., total 11.3c.; grand total 27.1c. The labor includes car barn charges for inspection and exchange. 95% of the cars are 4-motor cars.

Window glass.—What grade of window glass is used and what was cost per 1,000 car miles of Acconnt 32-F, Window Glass, for year ended Dec. 31, 1913?

W. R. McRae, Master Mechanic, Toronto Ry.—Double diamond glass in car windows at a cost, for 1913, of 20c. per 1,000 car miles.

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—American 32 oz. glass. Cost per 1,000 miles 0.31c. Cost is excessive on account of many old cars with drop sash, storm windows used on all cars during winter time, and non-folding swing doors in rear bulkheads of all cars.

Types of lamps in cars.—What type of lamp is used in cars and what is lamp consumption per 1,000 car miles a year?

W. R. McRae, Master Mechanic, Toronto Ry.—We use carbon lamps in all cars and lamp consumption in 1913 equalled 1.4 per 1,000 car miles.

Purchases by contract.—What materials are purchased under contracts of a year or more duration?

W. R. McRae, Master Mechanic, Toronto Ry.—We purchase only car wheels on a contract basis.

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—We endeavor to make all purchases without exclusive contract, excepting oils.

Crew for snow cleaning.—In addition to the transportation crew, is any shop man placed on snow ploughs and snow sweepers when operating on the road?

G. Gordon Gale, General Manager, Hull Electric Co., Hull, Que.—On snow sweepers, transportation crew only. On snow ploughs, one shop man in addition to transportation crew.

W. R. McRae, Master Mechanic, Toronto Ry.—Snow sweepers are operated and manned entirely by transportation crews.

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—No shop men on snow ploughs or sweepers.

Wear of wheels.—Can anyone give a good explanation as to why the wheels on the gear side of an axle wear much sharper and quicker than on the opposite end of the axle; is this the prevailing condition on other roads?

D. E. Blair, Superintendent Rolling Stock, Montreal Tramways Co.—We have never been able to find any serious increased flange wear on wheels on gear side of 2-motor trucks, but have found a difference on trucks equipped with only one motor. Increased peripheral wear seems to be general in both cases. The reason for this, in my opinion, is that because the gear is near to one end of the axle, the wheel on that side is subject to greater abrasion, owing to absence of spring between drive and periphery of wheel. In other words, the wheel on that side tends to do most of the constant slipping that occurs between wheels and rail to maintain a balance under the variables to which each wheel is subject, viz.—difference of diameter of wheels, curvature of track and torsional deflection of axle under heavy driving effort of motor.

Mainly About Electric Railway People.

W. H. MUNRO, Local Manager, Peterborough Radial Ry., is convalescent after several weeks illness.

A. S. FARMER, Superintendent, Gas Department, Moncton Tramways, Electricity and Gas Co., Moncton, N.B., has been transferred to Oklahoma, where the same interests carry on similar business.

G. R. G. CONWAY, Chief Engineer, British Columbia Electric Ry., gave an address to the Vancouver Branch of the Canadian Society of Civil Engineers, at its first winter meeting, Oct. 29, on the engineer and the war.

J. G. WALLACE, K.C., of Woodstock, Ont., who was appointed early in the year as trustee for the bondholders of the Woodstock, Thames Valley and Ingersoll Ry., has been appointed county judge for Oxford, Ont. He is continuing in the trusteeship.

A. E. BECK, K.C., who for a number of years has been one of the British Columbia Electric Ry.'s permanent counsel and also its Claims Agent, will leave the company's service at the end of this year to practise law on his own account. The company's legal and claims departments will be amalgamated under the control of the other permanent counsel, V. Lansen.

Clifton Carr, son of C. E. A. CARR, formerly General Manager, Quebec Railway Light, Heat and Power Co., and now of Toronto, is serving as a private in the Queen's Own Rifles, now at Salisbury Plain, Eng. He is a recipient of the Carnegie Hero Fund, for saving the life at New Orleans, La., two years ago, of an old man who attempted suicide by jumping from a ferry boat, and $2,000 has been set apart from the fund for his further education. He was born in Toronto, educated at Upper Canada College there, and Tulane University, New Orleans, and is 21 years old.

Electric Railway Projects, Construction, Betterments, Etc.

Brantford St. Ry.—Grand Valley Ry.—A press report states that a 200 kw. 25-cycle Westinghouse rotary converter has been purchased for installation in the power house at Brantford, Ont.

A contract is reported to have been let to T. Harper, Brantford, for the erection of a new station on the G.V.R. at Paris, Ont. (Nov., pg. 516.)

Chestermere and Calgary Suburban Ry.—The Alberta Legislature has granted an extension of time for the completion of this projected electric railway into Calgary.

Cornwall Street Ry., Light and Power Co.—The new franchise granted to the company will expire in 1934. It is practically the same as the one that has expired.

We are officially advised that no decision has been reached as to when the loop line on Cumberland and Water Streets will be built. (Nov., pg. 516.)

The Dunnville, Wellandport, and Beamsville Electric Ry. has a charter to build from Dunnville to Jordan and Beamsville, and to other points in the Niagara Peninsula of Ontario. The first section of the line, from Wellandport to St. Ann's, where it will connect with the Toronto, Hamilton, and Buffalo Ry., has been under construction since early last year, and we are officially advised that deeds have been secured for a considerable stretch of right of way, that about 12 miles of grading have been completed, that considerable work has been done on culcerts, drains, and fencing, and that the bridging is fairly well completed. An extension of time for the completion of the work was given the company last year. Some time ago negotiations were entered into with the Hydro-Electric Power Commission of Ontario, with the object of having the latter take over the work as then completed and incorporate it in the commission's scheme of municipal lines. The commission has had a survey of the line made, and is considering a proposition made by the company to take the line over on an actual cost basis. Nothing further has been accomplished in the proceedings to date. J. A. Ross, Wellandport, Ont., is President. (Nov., pg. 516.)

Fort William Electric Ry.—During this year the following extensions have been put in hand, and with two exceptions had been finished when we were advised recently: Yonge and Brock Streets, 0.74 mile; Sprague St., Walsh to Brock St., 0.42; Franklyn St., Victoria Ave. to Walsh St., 0.67; Victoria Ave., Vickers St. to Syndicate Ave., 0.15; Syndicate Ave., Victoria Ave. to Southern Ave., 0.65; Southern and Pacific Aves., Syndicate Ave. to Simpson St., 0.27; Island No. 2, excursion, 1.70 miles; total, 4.93 miles of single track; Frederica St., Yonge St. to Neebing Ave., 0.83 mile; Victoria Ave., Franklin St. to Vickers St., 0.25; total, 1.8 miles of double track. The single track on Island No. 2, and the double track on Frederica Ave. are the two pieces not completed. Track was laid on four extensions during 1913, which have been put in operation this year, viz., Frederica St., from the C.N.R. to Yonge St., 0.40; and three incinerator spurs, Frederica loading station, 0.35; Sprague loading station, 0.28, and Pacific Ave. incinerator, 0.27. Total, 1.25 miles. (Oct., pg. 476.)

Guelph Radial Ry.—The Board of Railway Commissioners has authorized the G.R.R. to construct an interchange track with the G.T.R., on Suffolk St., Guelph, Ont.

Hydro-Electric Power Commission of Ontario Projected Railways.—Representatives of the various municipalities interested in the bylaws voted on, Oct. 19, to which reference was made in our November issue (pg. 516), met in Toronto, Nov. 11. Fifteen municipalities are interested, and of these only two voted against the bylaw, the majorities in each being small. After discussing the situation it was decided to ask the town council of Newmarket and Uxbridge township council to again submit bylaws to the ratepayers. The Dominion Parliament will be asked next session to vote a subsidy at the same rate as for steam railways in aid of the building of the 75 miles of line projected. Sir Adam Beck, on behalf of the commission, stated that as soon as the bylaw is accepted in the two municipalities above mentioned the line for the distribution of power will be built through the whole 15.

The line will, it is stated, be given an entrance into Toronto along Danforth avenue, over the Toronto civic car line, and continue either along the new Bloor street viaduct or down the Don River Valley. (Nov., pg. 516.)

International Transit Co.—The Board of Railway Commissioners has authorized the building of a bridge at Tagona, Sault Ste. Marie, Ont., to carry a highway and the I.T. Co.'s tracks across the Algoma Central and Hudson Bay Ry. The cost of the bridge is to be borne by the electric railway company.

Lacombe and Blindman Valley Electric Ry.—W. L. McKinnon & Co., Toronto, advertised recently inviting tenders for $206,700 of this company's first mortgage bonds, maturing in 1943. The Alberta Government has guaranteed the principal and interest of the bonds for $7,000 a mile, or $273,700 for 39.1 miles. They bear 5% interest.

Lethbridge Municipal Ry.—The extension of the line under the subway was completed Nov. 6, and a service was put in operation towards North Lethbridge, Alberta, immediately thereafter. Commissioner Reid is reported to have said that the ratepayers having refused to vote the money, the paving could not be laid down this year.

The Moncton Tramways, Electricity and Gas Co. has a number of improvements under way. It is replacing all its old low pressure boilers with new high pressure boilers are of 200 h.p. capacity each, and will boilers of the return tubular type. The new be worked at 150-lb. pressure. Three boilers of this type are being installed, and with the one of this same type installed several years ago the company will have a boiler capacity of 750 h.p. New steam piping is being installed throughout the power house. A 150 kw. motor-generator set for operating the street railway during the day-time, when the lighting load is light, is also being installed. This set, which is being furnished by the Canadian General Electric Co., will be operated from the alternating system.

Moncton Tramways, Electricity and Gas Co.—A temporary frame car barn has been built to replace the building which was destroyed by fire, Sept. 14. This building is 30 by 80 ft., with accommodation for five cars, and is on the same site as the one burned. We are officially advised that it is probable that a steel and brick car barn will be built in the summer, on a new site which has not yet been acquired. (Oct., pg. 477.)

Montreal and Southern Counties Ry.—The Montreal City Council, Oct. 27, finally passed the bylaw granting the company permission to extend its tracks across McGill St. and along Youville St. to St. Peter St., along St. Peter St. to Youville Square, and along the south side of the square to McGill St., with a Y at the corner of St. Peter St. and the Square. One of the sections of the agreement releases the Council from any liability for damage in the event of the company being prevented from exercising the privilege granted by reason of the previously existing right of any other company to the use of the streets. The work is to be started in Jan., 1915, and proceeded with to a completion, or the franchise is to become void. (Oct., pg. 476.)

Application is being made to the Dominion Parliament for an extension of time within which the company may complete the several lines of railway authorized to be built.

Niagara Gorge Rd.—Press reports state that a contract has been let to the Turner Co., Buffalo, N.Y., for the building of a car house, repair and paint shop at Niagara Falls, N.Y., and that it will be of reinforced concrete and tile construction, 156 by 200 ft.

The Niagara River and Eastern Ry. Co. has been incorporated in New York State to build an interurban railway from the terminal of the Buffalo, Lockport, and Rochester Rd., in Buffalo, along the Niagara, Lockport, and Ontario Power Co.'s right of way, to Niagara Falls, N.Y., 20 miles. The capital is fixed at $1,500,000, the head office at Niagara Falls, N.Y., and the company is authorized to use steam or electric power for operation. The incorporators are: E. G. Connelte, President International Ry.; F. A. Dudley, Vice-President B., L., and R. Rd.; A. J. Porter, and A. W. Gray, Niagara Falls.

Oshawa Ry.—The Board of Railway Commissioners has authorized the C.P.R. to connect its recently opened Campbellford, Lake Ontario and Western Ry. in Oshawa, Ont., with the Oshawa Ry., which does a switching service for the different railways in the town.

Ontario West Shore Ry.—It was reported from Goderich, Ont., Nov. 19, that engineers representing the Hydro Electric Power Commission of Ontario, have been going over the line so far as it has been constructed, and the route as laid down, with a view of reporting on its value, as part of the electric railways projected for Western Ontario by the Commission. (Nov., pg. 517.)

The Ottawa Electric Ry.'s new auxiliary power plant is reported to have been put in operation Nov. 19, to have cost $200,000, and to be capable of generating 5,000 h.p. The boiler room is equipped with three Babcock and Wilcox boilers, self stoking, with mechanical feed and ash conveyors. From the boilers the steam passes into big steam domes and in turn feeds into a Westinghouse-Parsons double flow steam turbine 3,200 kilowatt capacity, but which can carry an overload of 50%. This turbine generator operates at the rate of 3,600 revolutions a minute. The plant is expected to obviate troubles from lack of power due to low water in the river. (Aug., pg. 385.)

Ottawa and St. Lawrence Electric Ry.—We are officially advised that contract has been let to Eastman, Kenny and Stearns, Russell Tp., Ont., for grading about six miles of the projected line, that about two miles of grading has been completed, and that it is expected to have about eight miles between Russell and Metcalfe completed and ready for the rails by the end of the year. H. W. Pearson, Confederation Life Building, Toronto, is Secretary. (Nov., pg. 517.)

Peterborough Radial Ry.—We are officially advised that the work on Charlotte St., Peterborough, Ont., is part of the reconstruction which has been carried out on about 25% of the company's line. The city council has, within the last year, entered upon an extensive programme of street paving, involving the streets upon which the tracks are laid. The company decided that when the city was carrying out its paving work, entirely new track and special work would

be put in position. During the autumn of 1913 and in the present year the company has been engaged in that work, and has laid 80-lb. A.S.C.E. section rail throughout in 60-ft. lengths, with continuous joint plates, inserted manganese guarantee construction in special work, with solid manganese switch tongues, and solid intersections at the principal railroad crossings. There is a good subgrade of gravel under all the reconstructed work, and the track was laid, after rolling on 6 x 7 cedar ties, placed at 2-ft. centres, and filled in from top to bottom with concrete, which was run at the same time as the base for the asphalt pavement. Between and outside the rails is paved with blocks. The Charlotte street section remains to be completed, but, although all the material is on hand, the work will not be carried out until next spring, as the city has decided not to pave the street until then.

It is proposed to make an extension of about a mile in the spring into recently built-up territory. At present the company is engaged on the extension and enlargement of the feeder system, and is putting up 10,000 lbs. of copper wire. During the summer about half a mile of track at various points has been reconstructed.

Sarnia St. Ry.—We are officially advised that the proposed extension south on Christiana St. to Clifford, and on Clifford St. West toward the river, at Sarnia, Ont., is not likely to be made until the spring.

Sudbury-Copper Cliff Suburban Electric Ry.—The Board of Railway Commissioners has authorized the company to build its tracks across the C.P.R. at Elm St., Sudbury, and across various spur lines and the C.P.R. Stobie branch.

Toronto Civic Car Lines.—We are officially advised that the electric railway to be built on Bloor St. west, as a civic undertaking, by the Toronto City Council, will extend from the west street line of Dundas St. to the east street line of Quebec Ave., approximately 4,000 ft. The permanent construction will be double track, paved with wood block. This work will be started in the spring, but meanwhile a single track is being laid on the north road allowance. The permanent roadbed will have 9 ins. of concrete under the ties, which will be of oak, 6 x 8 x 5 inches; girder rails, Ladin rail section 122-467, will be used, with rail brace triplates and wood block paving. On the temporary track 60-lb. rails, A.S.C.E. section, will be used, with light ballast. Work on the temporary construction was started Nov. 4, and it is expected to have it completed by Dec. 31.

The question of operating the line was considered by the civic works committee on Nov. 6, when the Commissioner of works was directed to negotiate an agreement with the Toronto Ry. It was reported that the company was willing to operate the line as a stub on the basis of 20c a car mile, and the Commissioner of Works said he was of opinion that the city could operate it at 16c per car mile.

The line will cost $125,000, of which amount $5,000 will be expended on the temporary line. Legislation authorizing the issue of debentures for this amount without a vote of the ratepayers will be obtained next session of the Ontario Legislature, the Premier having promised that it will bo enacted.

Winnipeg Electric Ry.—Press reports state that plans are being prepared for filing with the city council for extensions in the northwest section of the city, in accordance with the City Engineer's directions.

Montreal Tramways Company and Its Franchise.

The question of the Montreal Tramways Co.'s franchises, which has been under consideration by the Montreal City Council, came up at a meeting of the Board of Control, Nov. 11. There have been a number of suggestions put forward and reports made, the latest of which is one by the Mayor, which was made public Nov. 9. It is said that Controller Hebert is also preparing a proposal for a new franchise. As the full board was not present Nov. 11, the Mayor refused to have the matter considered.

The proposition put forward by the Mayor is in two parts. The first deals with what the company is asked to do, and the second with what the city would bind itself to do. The company is asked to abandon all existing franchises in territory from Lachine limits to Riviere des Prairies and Cartierville on the west, the river on the south, the boundary of Longue Pointe Ward on the east, and Riviere des Prairies on the north; to abandon all rights it now has of being exempted from taxes in that district; to give up any franchise it may possess in any territory outside the above-mentioned district when it becomes annexed to the city (the question of fares to be settled at a later date); to extend its double track on St. Lawrence Boulevard from the C.P.R. subway to Riviere des Prairies; to build the following lines by Nov. 1, 1915: On Cote des Neiges Road, from the cemetery entrance to a junction with the existing line on Queen Mary Road; from St. Dominique St. via Isabeau St. and St. Lawrence Boulevard to Cremazie Road; from Church Ave. via St. Patrick St. and Monk Boulevard to Allard St.; complete the double track on Notre Dame St. east to eastern limits of the city; from Papineau Ave. via Rosemount Boulevard to St. Michel Road; Masson Street line to be extended from Ninth Ave. to connect with the Pius IX. Ave. line; from Centre St. via Atwater, St. Patrick, Duberger, Gladstone, and Archibald to Church Ave.; to establish a service on Boyce St. as soon as the city opens it, between Maisonneuve and Tetreaultville; to construct four specifically named lines as soon as subways or overhead bridges are built; to submit questions of other extensions to the Public Utilities Commission and abide by its decision; to keep tracks free from snow and ice, and to pay one-half of the cost of the removal from the rest of the street; to pay $12,000 a year for street watering; to pay half of the interest and sinking fund chargeable to the city and the company for any work ordered by the city or the Public Utilities Commission; to pay full cost of work made necessary to the company by reason of a change of grade; to pay for street repairs extending 18 ins. from each track; to charge no more than a 5c fare between 6 a.m. and midnight, and no more than a 10c fare between midnight and 6 a.m.; to sell regular tickets at 6 for 25c, limited tickets at 8 for 25c, and school children's tickets at 10 for 25c; to charge no more than 5c and 10c fares as above on subways to be built by the city; to establish an auto bus service on streets to be designated within five years (provided the city has power to do so) at a 5c fare; to refer all claims and disputed accounts at present outstanding to arbitration; and to expend $130,000 on two ferry boats to St. Helen's Island, with an additional $20,000 on the necessary wharves.

The city in return to grant a new franchise covering the entire city, to run for 30 years, and to bind itself to do the following: To build at its own cost rapid transit underground tunnels, the company to furnish tracks and equipment, and to pay as rental a sum equal to the annual interest on the cost of construction; to build the first tunnel at once under St. Lawrence Boulevard, from Vitre St. to Mile End Station, and others as is deemed necessary; to extend the franchise for 10 years, if at the end of the 30 year period the city decides not to expropriate the system; to apply to the Legislature for an act to authorize the company to do the following: To establish a double track service on Vitre St., between St. Denis and Victoria Square, and to widen at its own expense Vitre St., from St. Denis to Victoria Square, the company to have the right to expropriate the land necessary; to put a full double track service on St. Antoine St., as far as De Courcelles St., St. Antoine St. to be widened to 60 ft., and the company to have the right to expropriate; to give to the city what land it owns as a right of way so that Notre Dame St. may be extended from St. Remi St. to Rockfield Road; to cede what land it owns between St. James St. and St. Clothilde Church for use as a public park; to expropriate the property of the Mount Royal Park incline railway within six months and to construct a surface line that will give suitable access to Mount Royal Park. (Nov., pg. 576.)

Electric Railway Notes.

British Columbia Electric Ry. employes have contributed $485.22 to the Vancouver citizens' war fund.

The Peterborough Radial Ry. has increased the number of its cars so as to give a 10-minute service on all its lines.

Chesterfield, Eng., is issuing tokens for the free transportation of Belgian refugees over its street railway and motor bus routes.

The Montreal City Council decided, Nov. 20, to cooperate with the Montreal Tramways Co. in its safety first campaign.

The Lethbridge, Alberta, Municipal Ry. has distributed a time card, showing the times at which cars will pass given corners, on all its lines.

A 54 hour schedule for the employes of the Lethbridge, Alberta, Municipal Ry. went into effect Nov. 9. The change enables the employment of two more men full time.

Welland, Ont., women, who acted as conductors for a day recently on the Niagara, Welland and Lake Erie Ry., secured $300 for the Canadian Patriotic Fund.

The Toronto Suburban Ry. is appealing to the Imperial Privy Council against a court decision which holds it responsible for the cost of paving the track allowance on Davenport Road, Toronto.

The British Columbia Electric Ry.'s office staff in Vancouver held their annual dinner Nov. 14. G. Kidd, General Manager, and G. R. G. Conway, Chief Engineer, were among the speakers. It was reported that the Office Staff Social Club had 175 members and was doing a good work.

The Toronto Board of Control is trying to secure a 5c. night fare for working people. The Corporation Counsel contends that under the Ontario Railway Act of 1913 no fare over 5c. shall be charged by any railway for a distance not exceeding three miles.

Sir Adam Beck, Chairman of the Hydro Electric Power Commission of Ontario, in addressing the University of Toronto Engineering Society recently, said the time had arrived when the Dominion Government should declare its policy in regard to granting subsidies for the proposed interurban electric railways to be built by municipalities under the commission's auspices.

C. Dunwell, a motorman on the Edmonton Municipal Ry., addressed a meeting of the Edmonton Property Owners' Association

recently, claiming that if given absolute control he could put it on a paying basis within six months. It was stated that the deficit is about $800 a day and that only about 36 cars, out of 80 owned, are being operated.

It was reported at a public meeting in Saskatoon, Sask., Nov. 13, that the capital cost of the Municipal Ry. was $733,396.50. The capital charges, including sinking fund and depreciation for 1914, were $55,813.91, and for the Sutherland extension, $1,062.17. Of the funds authorized to be raised under certain bylaws, there remained unraised, Oct. 30, $100,000 under bylaw 622 and $25,000 under bylaw 804.

A press dispatch from London, Ont., Nov. 19, stated that the London St. Ry. was ready to sell out to the city and that a written proposal would be laid before the Board of Control shortly. It also stated that the matter would probably be put to the vote of the ratepayers in January, and that the city's debentures would be acceptable to the company. The franchise has about ten years to run.

The Edmonton, Alberta, Radial Ry. has adopted a special "market transfer," in order to promote business at the newly opened civic market. Passengers going direct to the market, on market days, are given a "market transfer," which enables them to make the return trip on a single fare. Superintendent Larmouth is reported to have expressed the opinion to the civic authorities that a portion of the cost of this "transfer" should be borne by the Market Committee.

The six single truck street cars which the Brantford Municipal Railway Commission has ordered from the Preston Car and Coach Co., as mentioned in our last issue, will have bodies 21 ft. long, with 6 ft. vestibule at each end. The seats will be longitudinal, upholstered in woven rattan with spring seats and backs. There will be no bulkhead at either end. The steps will be folding, working in unison with the doors, under the control of the motorman or conductor only. The roof will be of the turtle back type, with automatic ventilators to ensure good ventilation, and the whole will be finished in natural cherry both inside and outside. The bodies will be mounted on heavy trucks, with 8 ft. wheel base. The electrical equipment will be Westinghouse 101 B2 motors, double equipment, brake type B to be applied at front end, Consolidated Car Heating Co.'s 192W heater. The cars will be delivered about the middle of December.

Toronto Ry.'s assessment reduced.—The Toronto Ry. Co. appealed to the Court of Revision recently, against the city's assessment, as fixed by the assessors, at $1,212.280 on structures on streets, that is, rails, poles, wires, etc., and $500,000 on conduits, cables, etc., a total of $1,712.280. The court reduced these items to $1,102,500 and $200,000, respectively, a total of $1,302,500. The plant in the Yonge St. sub station, fixed by the assessors at $184,000, was reduced by the court to $115,000.

U.S. Railways.—A Washington, D.C., press dispatch says:—"Completion of the work of physical valuation of railways will bring an answer to the question of whether the Government should own the nation's railways. C. A. Prouty, director of valuation of the Interstate Commerce Commission, also expresses the opinion that a general rate increase may be needed in this country."

The maximum freight car load 35 years ago was 24,000 lbs., whereas today there are 100,000 and 140,000 lb. cars, and the limit does not yet appear to have been reached.

Montreal Tramways Co's Construction.

We are officially advised that the following new work was done between Jan. 1 and Oct. 31:—

Bernard St., between Park Ave. and St. Lawrence, 0.275 miles double track or 0.55 miles single track.

Loop at Closse and St. Luke, 0.15 miles single track was installed.

Both pieces of work referred to above were laid with no. 115 girder rail, with the exception of the inside rail of the curves, which was laid with no. 132 g.g. rail.

Masson St., from 10th Ave. to 13th Ave., was laid with no. 80 T rail for 0.12 mile single track.

Notre Dame St. was laid with no. 80 T rail for 2.665 miles double track, and 5.33 miles single in Montreal East and Pointe aux Trembles, and in Longue Pointe Ward 0.55 mile double track was laid with no. 87 T rail (now under construction).

In addition to the above 8 miles of single track were renewed, also several large intersections, among which were those at the corner of St. Catherine and Atwater and McGill and St. James. The cost of these two alone was $50,000.

Canadian Electric Railway Association.

PRESIDENT—C. B. King, Manager, London Street Railway Co.

VICE PRESIDENT—James D. Fraser, Director and Secretary-Treasurer, Ottawa Electric Railway Co.

SECRETARY-TREASURER — Acton Burrows, Managing Director, Canadian Railway and Marine World.

EXECUTIVE COMMITTEE—The President, Vice President, Secretary-Treasurer and

E. P. Coleman, General Manager, Dominion Power and Transmission Co.

Patrick Dubee, Secretary-Treasurer, Montreal Tramways Co.

A. Eastman, General Manager, Windsor, Essex and Lake Shore Rapid Railway Co.

H. M. Hopper, General Manager and Purchasing Agent, St. John Railway Co.

Wilson Phillips, Superintendent, Winnipeg Electric Railway Co.

C. L. Wilson, Assistant Manager, Toronto and York Radial Railway Co.

ASSISTANT SECRETARY — Aubrey Acton Burrows, Business Manager, Canadian Railway and Marine World.

OFFICIAL ORGAN—Canadian Railway and Marine World, Toronto.

Among the Express Companies.

Dominion Ex. Co.'s employes have contributed $4,220 to the Canadian Patriotic Fund.

The Board of Railway Commissioners has issued orders establishing express delivery and collection limits for Kentville, N. S., and Red Deer, Alta.

J. C. Miller, a cashier of the Dominion Ex. Co., at Ottawa, was on Nov. 7, sentenced to four years imprisonment for embezzling $2,387.

The Canadian Ex. Co. has about 31,000 employes, 1,000 offices, 450 horses and 615 wagons, sleighs and motor trucks, and it operates over about 8,000 miles of territory.

The Dominion Ex. Co. has removed its St. John, N.B., office from its temporary position on King St. to the new C.P.R. building at the corner of King and Germain Sts. The company occupies a portion of the ground floor.

The Dominion Ex. Co. is being sued by the Postmaster General, at Calgary, Alta., for $77,260, for alleged infringements of the Post Office Act, in carrying large numbers of letters from Calgary to Edmonton and Lethbridge, for mailing at the latter places at the 1c. drop letter rate.

The revenue, expenses, etc., of the Canadian Northern Ex. Co. for June, were as follows:

	1914.	1913.
Receipts from operation	$84,623	$87,203
Express privileges	32,156	34,051
Total operating revenue	52,467	53,151
Total operating expenses	35,456	32,200
Net operating revenue	17,011	20,950
Taxes	6,389	631
Operating income	10,621	20,318

The Canadian Ex. Co.'s revenue, expenses, etc., for June, were as follows:

	1914.	1913.
Receipts from operation ...	$443,054	$392,242
Express privileges	286,154	237,420
Total operating revenue	156,900	154,822
Total operating expenses ...	131,391	146,810
Net operating revenue	25,508	8,011
Taxes	7,249	1,830
Operating income	18,259	6,180.

Vancouver Drydock Projects.

In Canadian Railway and Marine World for October it was stated, in connection with other information about the Dominion Shipbuilding, Engineering and Drydock Co.'s project for building a drydock, etc., at Vancouver, that it had been announced that the Dominion Government had approved the plans ,and granted the full subsidy under the act granting aid in the construction of drydocks. This information appeared to be reliable, but on making inquiry from the Public Works Department at Ottawa we are advised that no application has been received from the company referred to for a drydock subsidy.

An application has, however, been received from the Amalgamated Drydock and Engineering Co. of British Columbia, Ltd., for the construction of a drydock and appurtenant works at Vancouver, and while no subsidy agreement has been entered into, an order in council has been passed indicating the Government's willingness, provided the company can finance the undertaking, to subsidize a dock of the following dimensions:—Length from caisson stop to head wall, 1,150 ft.; width of entrance. 110 ft.; depth over sill at extreme high water spring tides, 41 ft.; depth over sill at low water spring tides, 24.25 ft.; the dock to be divided into two parts, 650 and 500 ft., respectively. The estimated cost of the dock is $5,458,418.37, and the subsidy mentioned in the order in council is 4% a year on this for 35 years.

Wentworth St. Incline Ry., Hamilton, Ont.—The Hamilton, Ont., Board of Control had a conference with G. F. Webb, Nov. 12, with reference to the extension of the Wentworth St. Incline Ry. Mr. Webb explained plans which had been prepared, showing tracks passing under the Toronto, Hamilton and Buffalo Ry., and across the G.T.R. on the level, and extending north from the present terminus, sufficiently far to reduce the existing gradient, and stated that he would undertake to carry out these plans if the city would construct a permanent roadway on Wentworth St. The members expressed a general approval, and asked that complete details be submitted, so that a definite decision might be reached and a recommendation made to the city council at an early date.

Melville-Davis Touring and Steamship Co., Ltd., has been incorporated under the Ontario Companies Act, with $40,000 capital and offic at Toronto, to carry on a foreign exchange business and to act as general steamship, railway, and transportation agents.

Marine Department

Progress of Work on the Welland Ship Canal.

From time to time, since the inception of the new Welland Ship Canal scheme, information concerning the operations have appeared in Canadian Railway and Marine World. The principal article, in July, 1913, described the work as then contemplated, and in Sept., 1913, a typical lock, such as is to be used in the canal, was described. Other information has appeared since. The general dimensions of the canal are as follows:

Length, lake to lake	25 miles.
Width, at bottom	200 ft.
Width, at water line	310 ft.
Depth, in canal prism	25 ft.
Depth, on lock sills	30 ft.
Number of lift locks	7
Locks, useable length	800 ft.
Locks, useable width	80 ft.
Height of lock walls above sills	81.5 ft.
Lift of each lock	46.5 ft.

The canal has been divided into 9 sections, of which 4 have been under contract for a year. The principal portion of the work undertaken to date is the section from Lake Ontario to opposite Thorold, embracing sections 1 to 3, and containing the 7 locks. This is the heaviest portion of work on the whole canal, and in consequence, a later commencement of the southerly end, where the work is lighter, will bring the sections to a completion at about the same date.

Section 1 includes 1½ miles of work on shore and 1½ miles in Lake Ontario. The lake work consists of dredging a 25 ft. channel from deep water to the shore line, the material being cemented gravel and hardpan, overlying shale rock. Some of the latter must also be removed. Sites will be dredged upon which to rest large reinforced concrete cribs, which will be sunk in line, and when filled with the dredged material, and a concrete superstructure built, will form long lines of docking, principally on the west side of the canal. There will also be 700 ft. of this crib work on either side of the entrance to the harbor, 1½ miles out in the lake. These concrete cribs are being made at Port Dalhousie, from which point, 3 miles distant, several have been towed to the new harbor and temporarily grounded.

The harbor is being formed by dumping all the surplus earth from sections 1 and 2 and the lower end of section 3 to form embankments or dykes on either side of the harbor. To allow a start to be made in forming these embankments, temporary wooden pile trestles are being built out into the lake in advance of the dumps, and the trestle on the west side is now somewhat over half way out to the extreme length, and the trestle on the east side is not very far behind. In order to give the piles of these trestles a firm bearing and more stability than would ordinarily be the case, underwater embankments are being built in advance of the trestle. These are formed by dumping the scows of excavated material from the dredges on the line of the trestle till the scows will no longer float over it, and through this dump the piles are driven. The embankments are not being built to their final width at present, which makes it possible for the dredging scows to dump their loads along the inner lines of the embankments in heavy weather when it is difficult to handle the scows in the open lake. A double track railway extends out on both embankments, with a third line along the dumping wall, where the earth from the dump cars is thrust over the edge by a spreader forced along by a small locomotive. It is expected that the side embankments of the harbor will eventually be 300 to 400 ft. wide at the top at the narrowest point, and considerably wider toward the shore. The material dumped into these embankments washes away to a very small extent under normal conditions, and even during storms no great quantity has so far been taken out. When the earth filling is completed rock will be brought from section 3 to roughly rip-rap the outer slopes.

In the harbor there is a sounding scow about 40 ft. square, provided with 4 large spuds or anchors. It was built for the general purposes of the survey staff in connection with the harbor work, but principally for ascertaining the elevation of the surface of the rock beneath the overlaying material and as it was liable to be caught out in rough weather before the piers were extended out as far as they are, and as sometimes a perfectly steady platform is required, the scow is arranged with a heavy engine on each spud, by means of which it is enabled to hoist itself completely out of the water and above the reach of wave action, which will thus have only the 4 spuds to strike against. When it is required to move the machine the scow is lowered into the water and the spuds lifted up clear of the bottom by the same machinery. There are at present two large dipper dredges in operation. The dredge that foundered last year off Port Dalhousie, is being raised.

Trains of dirt cars from the excavating machines arrive and depart constantly from the service ground fill in the lake. Several different styles of dump cars are used on this work, the principal kind being a 12 yd. car, automatically operated by compressed air. Approximately 2,500,000 cu. yds. of excavated material have been carried to the pier construction up to Sept. 30.

The head of lock 1 will be located under the Lake Shore Road. This road, and the Niagara, St. Catharines and Toronto Ry., will be carried over the lock on bridge 1, which will be of a wide bascule type. A drag-line excavating machine is working in the lock pit, having completed the excavation for the west entrance wall. This wall will extend from near the lake to the foot of the lock and will be of reinforced concrete, buttress type. A departure from the ordinary has been made in its design, in that structural steel frames are used, one in each counterfort, for the purpose of supporting the reinforcing steel rods, many of which pass through holes punched through the frames, and also for the purpose of supporting the contractor's forms. This wall is founded on rock, and the concrete crib docking will be built to form an extension of it into the harbor. Drag-line excavating machines are being extensively used on the several sections and represent a departure in excavating machinery which have only come into use during the last few years. They have a wider radius of action from one setting, and can operate to greater depths, the full depth of this section being excavated from the one setting. The cribs, to which reference has already been made, are divided into 18 compartments, and each compartment is provided with a temporary wooden bottom held down by diagonal braces fitted to notches built in the side walls. When the crib is finally sunk in position by means of water let into it through pipes provided for that purpose the temporary bottoms will be removed by pulling on ropes which are attached to wedges holding the struts in place, thus allowing the bottoms to float to the surface, and they will be used over and over again in the different cribs. Fifty-five cribs in all will be required, each 110 ft. long, 38 ft. wide and 34 ft. high, and weighing 2,000 tons. When sunk the top of the cribs will be on a level with the water as it now stands in the lake.

Harbor at Port Weller at Lake Ontario End, Welland Ship Canal, with Piers extended about Half Way.

Bridge 2, at station 145, near the upper end of section 1, will also be a bascule, carrying the highway across the canal prism and upper end of the pondage for lock 1, which has an area of 107 acres at elevation 289.0.

The Dominion Dredging Co., Ottawa and Port Weller, Ont., has the contract for this section. Several subcontracts have been let as follows: Lane Bros., locks, retaining walls and other concrete work; and J. H. Tromanhauser Co., 55 cribs for entrance piers and gate yard slip.

Section 2 extends from stations 150 to 380—about 4½ miles. This section comprises the excavation of some 7,000,000 cu. yds. of

earth, the building of locks 2 and 3, and the substructure of bridges 3, 4 and 5, and will cost approximately $5,500,000, exclusive of lock gates, bridge superstructures, valves and other steel work, and cement. Excavation has proceeded very rapidly on this section by means of heavy steam shovels, drag-line excavators and several mule outfits operating in connection with western grading machines. The drag-line excavating machine is undoubtedly a coming machine for many kinds of excavation.

The pondage for lock 1 extends into this section to lock 2, which is situated toward the lower end of the section. At the site of this lock there is a peculiar shaped pit about 175 ft. by 25 ft., enclosed by steel piling, which will be the site of the upper breast wall of the lock. These piles are 45 ft. long and have been driven to refusal. It was expected they would have gone deeper than they actually have, and it is not known exactly what stopped them, as previous borings did not show particularly hard material at the depths at which they stopped. The material inside them is being excavated, the piles in the meantime being supported by heavy wooden bracing, and when solid rock is reached at a depth of about 60 ft. the pit will be filled with concrete and will form the upper breast wall of lock 2. This method of construction was adopted in order to conserve the ground above the breast wall in its natural state, as had the lock pit been excavated in the usual manner it would have been open for two years, during which time a slope probably flatter than 1 to 1 would have formed above the breast wall, as well as along the sides of the pit, whereas the present method will leave the material above the breast wall intact.

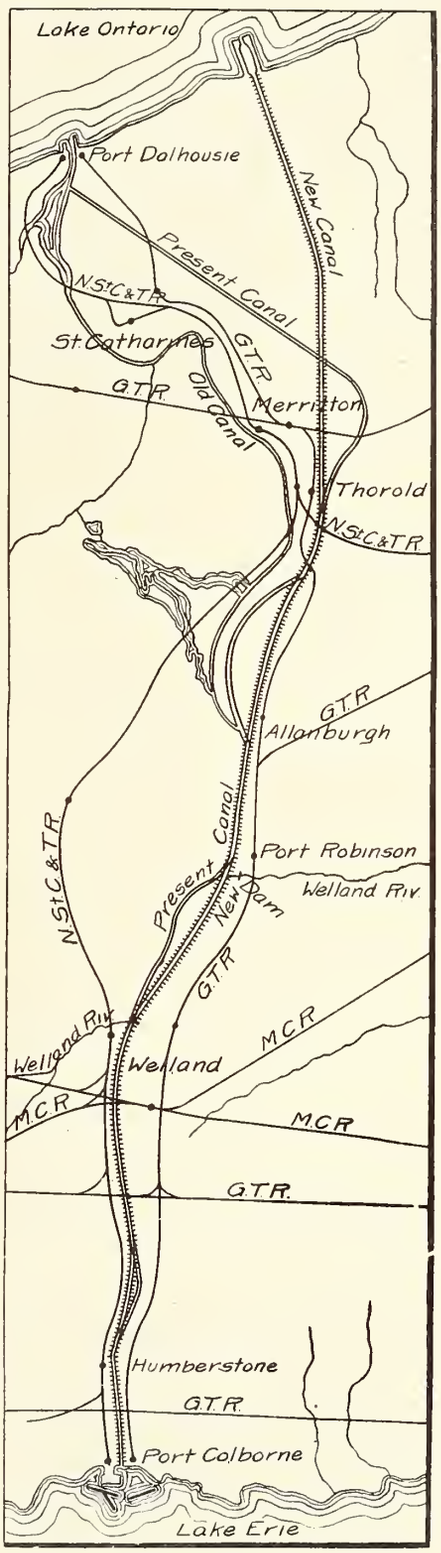
A concrete protection extending from a berm 5 ft. wide and located 5 ft. below the water line to a height of 5 ft. above it, is being laid opposite the Engineer's Office at Homer. This protection consists of a 6 in. slab of concrete laid on 12 ins. of broken stone, and it is expected this will serve all purposes better than ordinary stone protection. Below the site of lock 2 the berm has had the slope trimmed and a cut made to grade all at one operation by a drag-line excavator and a very small gang of men.

Above lock 2, there is a 200 acre pondage, at elevation 335.5, on the east side of the canal, retained by an embankment extending from lock 2 to Homer, the upper valley of Ten Mile Creek being utilized for this purpose, the lower portion of the basin being protected on the east side by an embankment. Between locks 2 and 3, at station 297, there will be located bridge 4, a bascule, on which the highway will be carried across the canal prism.

The upper end of lock 3 will be at the point of crossing of the new ship canal by the present canal, and north of the latter the two levels being the same, at elevation 382.0. A moderate sized dam is being built to the east of lock 3 to form a 150 acre pond or equalizing basin for lock 3. These ponds or regulating basins are necessary in order to prevent fluctuations in the levels when a lock is filled or emptied, as the filling of a lock would draw down the water of a 75 acre pond 1 ft. It is therefore advisable to have these ponds as much over 75 acres as possible. Some excavation has been done in the lock pit 3. Bridge 5, a bascule highway bridge, will cross the canal prism at station 374, near the upper end of the section.

The embankments along section 2 are being built by mule teams hauling waggons from the grading machines to the different banks, where the earth is placed in layers and compacted by the waggon wheels after being watered. The slopes are being sodded as the work proceeds. This, it is expected, will prevent the usual washing out of the slopes and will materially reduce the cost of maintenance of the canal, besides adding to the appearance of the banks.

Baldry, Yerburgh and Hutchinson, London, Eng. and St. Catharines, have the contract for section 2, and have sublet portions



Route of Welland Ship Canal.

as follows: Yale and Reagan, portions of excavation work; Hill-Leonard Engineering and Construction Co.; Stein and Reade; Michael Conroy, construction of embankment, about 50 mule teams being at work on this last subcontract; Jos. Battle, concreting, this subcontract is completed; Ernest Bennett, a number of culverts; and Jos. Riley, sodding finished slopes of canal.

Section 3 covers about 2 miles, situated mostly in the town of Thorold, and the value of the work to be done, not including lock gates, bridge superstructures, valves or Portland cement, is $10,000,000. There are 3,500,000 cu. yds. of earth, 2,500,000 cu. yds. of rock and 1,500,000 cu. yds. of concrete masonry on this section. Near the lower end of this section, three twin locks in flight will be built, the lower ends of twin locks 4 being located under the G.T.R. main line, where four large steel spans are temporarily carrying the diverted railway. These three locks will lift a vessel 139½ ft. to an 84 acre regulating basin, which will be formed by the large dam now in course of construction on the east side at the head of lock 6. Above this pond will be built single lock 7, the head of the lock being situated at Peter St., Thorold, where a swing bridge crosses the present canal at the head of lock 24. A bascule bridge will be placed over the head of the lock at this point.

In order to carry the double track G.T.R. main line over the works during construction, to allow free passage for the excavated material from the lock pits to the stone crusher, located just north of the main line, and to Lake Ontario, the railway has been slightly diverted to the north, and is carried on four heavy steel spans across the site of the foot of twin locks 4. In order that this diversion might be finally disposed of and cause no further trouble to the G.T.R. or to the contractor, the centre pier upon which one end of these steel spans rest has been sunk through earth and rock, to a depth of 90 ft., to the level of the foundations of the lock, and it will eventually be incorporated in the centre wall of the locks. The side piers have been sunk to about two-thirds of this depth, to the surface of the rock below. This will allow the contractors to excavate the lock pit completely without interfering with the bridge, and allow the lock walls to be built. When the locks are completed, two bascule lift bridges will be placed on the present line of the G.T.R. and the line replaced to its former position. The temporary spans will then be removed. It will be noted that instead of building double track spans, two single track spans have been constructed, the idea being that they will be easier to sell upon the completion of the work, than a double track structure.

The dam at the head of lock 6 is of earth construction having a concrete core wall extending from the rock surface to an elevation about 30 ft. below the top of the dam. The dam will be 75 ft. high at the highest point, and the core wall is built in a trench in the clay overlying the rock, varying in depth from 5 to 30 ft. The good earth from the excavation has been dumped on either side of the dam site, to be afterwards rehandled into the work. The seat of the dam was carefully prepared by removing all loam and other loose material and benching all sloping surfaces. A toe trench was then excavated along the full length of the dam for a few feet in depth into the solid material, and the dam has been built up in layers of approximately 8 to 12 ins., each layer being carefully watered, spread and rolled. The process will be continued to the top, which will use up all the material now along each side of it. A heavy stone talus, consisting of rock from the excavation, will be placed on the down stream side of the dam, to add weight and to prevent sliding, and earth will be dumped on the up stream side after the water has been let in, to reduce the depth of water in the pond to about 10 or 12 ft.

The G.T.R. Port Dalhousie-PortColborne branch now runs across the sites of locks

5, 6 and 7, and is shortly to be moved to its new location in the very large cutting extending along the west side of the new work; 1,500,000 cu. yds. of material have been removed from this cutting within a length of 1½ miles. This line will divert from the G.T.R. main line near the present branching off point, a short distance to the west of the new crossing of the canal.

Bridge 6 will be a double track bascule bridge, carrying the G.T.R. main line over twin locks 4. At the head of this triple lift of locks will be bridge 7, a bascule highway bridge crossing the upper end of lock 6. The upper end of lock 7 will also be crossed by a bascule highway bridge. The crossing of the canal by the Niagara, St. Catharines and Toronto Ry. will be bridge 9. On the west side of the canal, this line will be carried on a reinforced concrete bridge spanning the G.T.R. division, which is completed, while the line will be carried across the new canal on a swing bridge, which will be the only one of its type on the canal. Both the centre pier and abutments, all of concrete, are completed, and only await the steel span, when the line will be diverted to this bridge.

As there is plenty of rock on section 3, but none on sections 1 and 2, the contract for section 3 provides that the contractor must crush all the rock required for concrete, etc., for sections 1 and 2, and for this purpose a large stone crushing plant has been erected north of the G.T.R., which is in operation. The crushed rock will be stored in a huge pile, extending out from the highest end of the crushing plant, and the contractors for sections 1 and 2, when they require crushed rock, will send their cars to the pile, where they will be loaded by the contractor for section 3. This crusher is of large size, and has a capacity for 3,000 cu. yds. in a 10 hour day. Its location, immediately below the heavy cutting for the triple locks, is such as to provide a convenient location for the contractor dumping the excavated rock from the cuttings. Keystone and cyclone drills, operated by electricity, are in operation on the site of lock 5, drilling blast holes from 30 to 40 ft. deep in the rock.

The contract for this section is held by the Confederation Construction Co., an amalgamation of the interests of O'Brien and Doheny, and Quinlan and Robertson, of Montreal, the headquarters for that contract being at Thorold. No subcontracts have been let on this section.

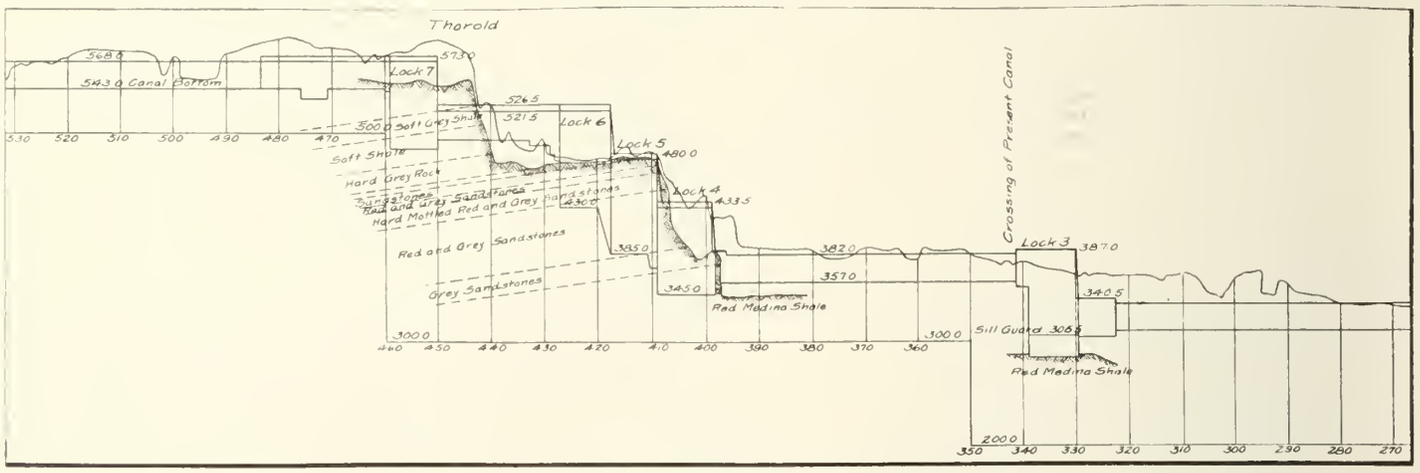
A short distance north of the crushing plant 150 ton track scales are being constructed, which will weigh a train of cars 110 ft. long. These scales will weigh all the stone leaving the crushing plant for sections 1 and 2. From the scales to Lake Ontario, little over 6 miles, the Railways and Canals Department has built a double track, standard gauge, construction railway along the west side of the canal. This railway is carried over the present canal, about a mile below the crushing plant at lock 3, by a double track steel bridge, completed recently. The department maintains this railway and supplies a superintendent, dispatchers and switchmen, who control all the operations on it. The contractors for sections 1, 2 and 3 are entitled to the free use of this road for moving crushed stone from the crushing plant to their respective works, and for removing excavated material from their works to the service ground fills in Lake Ontario. A complete interlocking plant and block signal system is being installed.

Section 4a is a small one, covering the construction of two culverts, between the present and the original canal, and a supply weir for supplying water to the original canal, which will be filled from Allanburg, for some distance north, with excavation from section 5. McGuire and Cameron, St. Catharines, Ont., have the contract for section 4a at approximately $80,477.50.

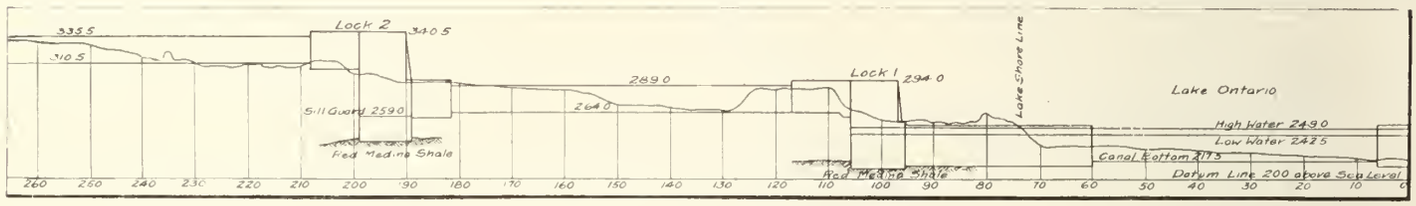
On section 5, Allanburg to Port Robinson, about 2½ miles, the contract is held by the Canadian Dredging Co., Midland, Ont., for approximately $1,945,788. A subcontract for the dry excavation work on this section has been sublet to J. H. Corbett & Co., Moncton, N.B.

Contracts for sections 4, 6, 7, 8 and 9 are still to be let. As these sections cover principally the widening and deepening of the present canal prism, the work is light, and it is said that it will be possible to complete it in half the time of the heavier work on sections 1, 2 and 3. Section 6, with its diversion of the new canal into the Welland River, and section 8, with a diversion at Humberstone, with guard lock, will be the two heaviest sections on the upper reach of the canal.

The surveys for the new canal were made under the direction of J. L. Weller, M. Can. Soc. C.E., Engineer in Charge, who also prepared the plans, etc., and who is superintending the construction. The foregoing information was secured through Mr. Weller's courtesy on an inspection trip made by the Canadian Society of Civil Engineers, Toronto branch, Oct. 31, under the charge of A. F. Stewart, Chief Engineer, Mackenzie, Mann & Co., Ltd., president of the branch. The University of Toronto Engineering Society accompanied the party. Sections 1, 2 and 3 were carefully gone over, four open electric cars provided by the Niagara, St. Catharines and Toronto Ry. being hauled over the construction railway by a contractor's locomotive from the south end of the line, the party returning to St. Catharines from Port Weller on the same cars under their own power, over the N. St. C. and T. Ry.'s new Niagara-on-the-Lake line.



Profile of North End of Welland Ship Canal.



Profile of North End of Welland Ship Canal (contd.).

Aids to Navigation in Hudson Bay.—The Department of Marine has installed 10 beacon lights on the Aga system at Button Islands, Wales Island, Charles Island, Digges Island, Hatton headland, Ashe Inlet and Nottingham Island, in the Hudson Strait; and on Mansel Island, Cape Tatnain and Coats Island, in Hudson Bay. They have not yet been put in operation, but are all ready for operation at the beginning of navigation next year. Buoys have also been taken to Hudson Bay, to mark the entrance to Nelson River.

Movements of Suspicious Vessels.—The masters of all vessels in Canadian waters are requested to report the movements of any suspicious craft which they may meet, to the Customs officer of the first port at which they touch, for transmission to the captain in charge of the dockyard at Halifax, in the case of the Maritime Provinces, and to the Superintendent of the dockyard at Esquimalt in the case of the Pacific coast. It is not desirable that any hearsay information should be given, but it is very important that all definite information secured by masters themselves be forwarded promptly.

Dominion Government s.s. Grenville for Buoy Work in the St. Lawrence River.

The s.s. Grenville, a buoy tending steamboat for the Marine and Fisheries Department, was launched at Toronto, Nov. 7, and it is expected that she will be ready for service before the opening of next navigation season. Following are the principal particulars:

Length, between perpendiculars .....155 ft.
Length, overall .....164 ft. 6 ins.
Breadth, moulded .....30 ft.
Depth, moulded .....13 ft.
Draught, fully loaded with 183 tons dead weight ..... 9 ft. 6 ins.
Coal, bunker capacity .....100 tons
Complement, officers and men 24

The vessel is of steel construction, built under the government survey, to be classed as 100 A1 at Lloyd's and also built under their special survey. She will be fitted with water ballast, and the full equipment will be according to the requirements of the Board of Trade and the Canadian Steamboat Inspection Act. She has six main transverse watertight bulkheads; a watertight bulkhead at the bow and stern, with the bulkheads adjoining, form trimming tanks. She has a straight stem, cruiser stern, lower, main, bridge and forecastle decks.

The captain's quarters are on the bridge deck. On the main deck, on the port side, are the several messes, and on the starboard side, the quarters of the junior officers. In the centre, the well rises from the lower deck. Back of this is the entrance hall, to the rear of which is the main dining saloon. Forward on this deck are the deck stores and cold storage, with a 10 ton winch engine. On the lower deck forward, are the crew's quarters, with the hold midway, back of which are the coal bunker, boiler room and engine room in succession. All staterooms, storerooms, bathrooms, toilets, pantries, galley and other spaces are fitted with lavatories, sinks, shelves, cupboards, drawers, wardrobes, lockers, settees, desks and other accessories required for the particular purpose for which each room is adapted.

The hull is of steel throughout. The stem is of rolled steel, 6¾ by 1¾ ins., while the stern frame is a scrap iron forging, with a propeller post 6¼ by 4 ins., and a rudder post 5¾ by 4 ins. The rudder is of an area of about 40 sq. ft., of 30 lb. steel plate on a scrap iron forged frame, with a 6 in. forged steel rudder stock, the latter enclosed between the hull and main deck by a watertight trunk of steel plates.

The keel is of the flat plate construction, 38 in. 27 lb., from the stem to three-fifths the length amidships, reduced to 18.77 lbs. at the aft end. The centre vertical keelson in the way of the engineroom is 13.87 lb., reduced to 12.24 lb., at the aft end; in the boiler space, 15.5 lb.; and in the way of the double bottom, 30 ins. by 14.69 lb., reduced to 12.24 lb. at the forward end. The vertical keel is connected to the flat plate keel by double 3½ by 3½ in. by 7.91 lb. angles, and to the floors, by double 3 by 3 in. by 5.81 lb. angles. The double keelson bars extending from the forward bunker bulkhead to the engineroom, are 3½ by 3½ in. by 6.57 lb. angles. The foundation plates are 12 in. 13.87 lb. There are two side keelsons in the way of the ordinary floors, of 12.24 lb. plates, connected to the bottom plating by single 3 by 3 in. by 5.81 lb. angles, and to the floors by single 2½ by 2½ in. by 4.79 lb. angles, and extend sufficiently above the floor plates to connect to single longitudinal 5 by 4 in. by 10.29 lb. angles. In the way of the boiler space, the intercostal plates are 13.05 lb., with extra intercostals in way of the engine space for the engine seating. In the way of the double bottom forward, the intercostals are 11.42 lb. connected to the bottom plating by 3 by 3 in. by 5.81 lb. angles, to the floors by 2½ by 2½ in. by 4.79 lb. angles, and to the inner bottom plating by a single 3 by 3 in. by 5.81 lb. angle bar.

The main framing is of 5 by 3 in. by 9.72 lb. angle section, spaced 22 in. throughout, increasing to 5½ by 3 in. by 11.02 lb. from the break of the forecastle forward to the stem. Within the double bottom, the frames fitted to the solid floors are of 3 by 3 in. by 5.81 lb. angles, and from frame to bracket floors, 3½ by 3 in. by 6.32 lb. The bulkhead frames are single 3½ by 3½ in. by 8.98 lb. angles. Reverse frames, fitted to every floor, are of 3 by 3 in. by 5.81 lb., extending from the centre line to the upper turn of the bilge, and are doubled in the way of the engine and boiler spaces. In the double bottom, the reverse frames to the solid floors are 3 by 3 in. by 5.81 lb., and to the bracket floors, 3 by 2½ in. by 4.46 lb. There are 4 web frames, of 14 in. 12.24 lb. plate, connected to the shell by single 3½ by 3½ in. by 8.98 lb. angles, and framed on the inner edge by a single 5 by 3 in. by 12.75 lb. angle.

In the way of the engine room, the floor plates are 14.69 lb. plate, fitted to every frame, reducing aft of the engine room to 11.42 lb. In way of the boiler space, they are 17.14 lb. In way of the double bottom, there are alternate solid and bracket floors, the solid floors of 11.42 lb. plate, lightened by manholes about 32 by 13 ins., and the bracket floors are 11.42 lb. plates, connecting the centre girder and margin plates to the intermediate frames and reverse frames. The bracket plates to the tank margin and outside plating are 12.24 lb. plates, flanged on their inner edge and connected to the margin plate by a single 3 by 3 in. by 5.81 lb. angle. Forward of the double bottom, the floors are 13.06 lb. plates.

The engine seating on top of the ordinary floors has a sole plate of 25.59 lb. plate, connected to the vertical plate by double 3 by 3 in. by 7.81 lb. angle bars. The holding down bolt angles are 5 by 3 in. by 10.34 lb. The boiler saddles are formed of 17.13 lb. plates, framed by 3½ by 3½ in. by 8.98 lb. double angles, and rivetted to double reverse bars by double 3½ by 3 in. by 8.3 lb. angles.

The middle line strake of inner bottom plating is of 30 in. 13.87 lb. plate, with the other strakes of 11.42 lb. plating. The tank margin is 20 in. 12.24 lb., connected to the floors and tank brackets by two single 3 by 3 in. by 5.81 lb. angles, and similarly to the outside plating. The forepeak bulkhead is of 12.24 lb. plating, with the balance of 11.42 to 10.61 lb. plating. The forepeak bulkhead is stiffened by vertical 4½ by 3 in. by 8.51 lb. angles at 24 in. centres, and the other bulkheads, by 4½ by 3 in. by 8.51 lb. angles at 30 in. centres, vertically on one side, and 5½ by 3 in. by 8.51 lb. bulb angles horizontally on the other, fitted in line with the side stringers. The side stringer, between the main deck and the upper part of the bilge, is 8½ in. 13.05 lb. plate, connected to the outside plating by intercostal 3 by 3 in. by 5.81 lb. angle bars, and faced by a 3½ by 3 in. by 6.57 lb. angle bar.

The main deck is plated with 10.61 lb. plates, all fore and aft, with the main deck stringer of 36 in. 15.5 lb. plate, reduced at the ends to 16 in. 12.24 lb., with the stringer angle bars 3 by 3 in. 7.17 lb. The lower deck forward is of 10.61 lb. plate, with a lower deck stringer 18 in. 11.42 lb., connected to the shell and frames by 3½ by 3½ in. by 8.98 lb. angle bar collars. The bridge deck will have a stringer plate 16 in. 10.61 lb. with stringer angles 3 by 3 in. by 4.89 lb., and 7 in. 10.61 lb. tie plates and diagonals. The forecastle deck stringer is 16 in. 10.61 lb. connected to the shell by 3½ by 3 in. by 5.31 lb. angle bars. The windlass sole plate is 16.32 lb. and the tie plates and diagonals, 7 in. 10.61 lb. The side, end and tie plates forming the flying bridge are of 10.61 lb. steel plates.

The main deck beams in the way of the well are 5½ by 3 in. by 11.33 lb. bulb angles, fitted to every frame and connected to the frames by 19 by 19 in. 13.87 lb. knees, while clear of the well they are of 5½ by 3 in. by 9.7 lb. angles, fitted to every frame by 17 by 17 in. by 13.87 lb. knees. The lower deck beams are 4½ by 3 in. by 9.08 lb. angles, fitted to every frame by 14 by 14 in. 12.24 lb. brackets. The bridge deck beams are of 5½ by 3 in. by 11.02 lb. angles, fitted to alternate frames by 15 by 15 in. 12.24 lb. brackets. The flying bridge beams and supports are 4 by 3 in. by 7 lb. angles. The forecastle deck beams are 6 by 3 in. by 11.7 lb. angles, fitted to alternate frames by 16 by 16 in. by 13.87 lb. brackets.

The shell plating is of ship steel. The keel is of the dimensions before mentioned. The first four strakes from the stem to the break of the forecastle are 16.32 lb., and aft of this point, the first two are of 16.32 lb. for half the length amidships, reduced to 13.8 lb. at the aft end, and increased to 19.5 lb. in way of the boilers. The third strake is 15.5 lb. for half the length amidships, reduced to 13.8 lb. at the aft end, and 19.5 lb. in way of the boilers. The fourth strake is 14.68 lb. for half the length amidships, reduced to 13.05 lb. at the aft end. The fifth strake is 18.77 lb. from the stem to the aft end of the well, 15.5 lb. from there to half the length amidships aft, and reduced to 13.05 lb. at aft end. The sheer strake is 18.77 lb. from half the length amidships, reduced to 16.32 lb. at fore end and to 13.05 lb. at aft end. The forecastle side plating, bulwark plating, and bridge side plating, are 12.24 lb.; and propeller boss plate, 15.05 lb.

Rubbing keels are fitted for about 70 ft., consisting of 10 by 8 in. rock elm, connected to the shell by 4½ by 3 in. by 9.66 lb. angle bars, and with a face plate of 20-lb. plate.

There are two fresh water tanks, with a total capacity of 1,800 gals., of 12.24 lb. plate. The bunker capacity is about 100 tons, filled through 22-in. coaling scuttles on the main deck. There are two masts on deck, the lower ends of steel, with pitch pine upper ends. The foremast is fitted with a 15-ton steel derrick, operated by a winch located forward. There are also two 2-ton derricks on the main deck. The vessel is also provided with two 24-ft. lifeboats.

The vessel is steam-heated throughout by 25 lb. steam, reduced from the boilers, with a heating ratio of about 1 sq. ft. of heating surface per 100 cu. ft. of space. There is also a complete electric light system, with about 140 lights, in addition to a 16,000 c.p. searchlight projector, 20 ins. diam. The steering gear is operated by a horizontal 5 by 7½ in. engine.

The propelling machinery consists of a single screw, triple expansion 14 by 22½ by 38 by 24 in. engine, jet condensing. It is designed to develop 900 i.h.p. at 185 r.p.m. on 180 lb. steam. There are two Scotch boilers, single ended, 10 by 11 ft. with a total heating surface of about 2,260 sq. ft., and operated under forced draught.

The pumping equipment consists of fresh water pumps, sanitary pump, bilge pump, main feed pump, general service pump, ballast pump, and feed filter.

The vessel has been built by the Polson Iron Works, Ltd., Toronto.

The Lingan-Montmagny Collision.

The enquiry into the collision between the s.s. Lingan, under charter to the Dominion Coal Co., and the Dominion Government s.s. Montmagny, Sept. 18, when the latter vessel sank with the loss of 14 lives, was held recently at Quebec, before Capt. L. A. Demers, Dominion Wreck Commissioner, with Capts. F. Nash and E. C. Seats as nautical assessors. The court found that the collision was due entirely to faulty navigation by the pilot and crew of the Lingan, and the pilot, F. Gaudreau, and chief officer, Olaf Swanson, were found to have been in default. The pilot's license was suspended for the balance of the navigation season, and he was fined $200, to be paid in four quarterly instalments of $50 each, and the chief officer's certificate was suspended for ten months from Oct. 20.

The master of the Lingan, T. Garbett, while exonerated in the matter and while due cognisance was taken of his commendable and prompt action after his arrival on the bridge, was nevertheless criticized and reprimanded for having retired while his vessel was navigating a narrow and difficult section of the river, and his action was considered the more reprehensible when it was considered that the propitious weather conditions that had prevailed since his leaving Sydney had not necessitated his keeping lengthy vigil on the bridge. The master of the Montmagny, Capt. Pouliot, acted in accordance with the rule of the road and was therefore exonerated.

The judgment concluded with the statement that the duration of time which the Montmagany remained afloat following the impact formed the subject of keen enquiry, and as the preponderance of evidence estimated it to have been five minutes, the work of rescue was necessarily restricted to an all too short period. Brief though it was, it is nevertheless to be deplored that the flight of almost its entire crew over the rails of the Lingan remained unmarked by a single valorous deed, and the more lamentable is all this when one is forced to reflect that children raced the decks of the foundering vessel while the fleeing crew leaped to safety and ignored their cries. Further the court most emphatically states that the proverbial bravery of seafaring men was not displayed on this occasion, that the master was not the last man to leave his vessel, that the steward failed to show that he made special efforts to waken and assist the passengers who were to all intents and purposes under his charge, and that the engineer, who claims he had two children with him, abandoned them to save himself.

The Requisition of British Vessels for War Purposes.

A board of arbitration has been appointed in Great Britain in connection with the requisitioning of British vessels for general purposes during the war. Lord Mersey, who presided at the official enquiry into the loss of the s.s. Empress of Ireland, at Quebec, recently, has been appointed President, and W. Walton, Vice President. At the request of the Admiralty, the council of the Institute of Marine Engineers has nominated a member, Jas. Denny, a past president of the Institute. The rules under which the Board will deal with matters that will come before it, provide that claims arising out of the requisitioning of any vessel shall be made out in full detail and submitted to the Secretary of the Admiralty in triplicate within one month from the taking up of the vessel for service, accompanied by all necessary vouchers and documents. If the Admiralty and a claimant fail to arrive at an agreement within a reasonable time, to be determined in each case by the President, the Admiralty shall report the matter with the necessary papers to the President, who shall refer the matter to two arbitrators selected by him from the panels of arbitrators for consideration and report. The joint award of such arbitrators shall be final, and if they are unable to agree, the matter shall be referred to the President as umpire, who in all matters shall act entirely in his discretion, and his award shall be final. The Vice President may act under the direction of the President, and also as President, if the latter is unable to act. The President may alter or add to existing rules, and may authorize the arbitrators to act as a board to consider questions of general applicability, such as the approximate monthly hire for vessels of different classes, and other similar matters.

The Second Stranding of the s.s. Floriston.

Following an investigation into the accident to the s.s. Floriston by striking an iceberg in the Strait of Belle Isle, and the subsequent beaching of the vessel west of Rich Point on Aug. 29, which was held at Quebec, Sept. 23, the judgment in which was given in Canadian Railway and Marine World for November, a further investigation was held into the causes of an additional accident to the same vessel by stranding on Guyon Island, N.S., Oct. 13, at Louisburg, N. S., on Oct. 27, before Capt. L. A. Demers, Dominion Wreck Commissioner, and Capt. Neil Hall, Halifax, N. S., and Capt. R. MacDonald, North Sydney, N.S., nautical assessors. Following is the judgment:—

In view of the evidence given, the court followed the courses and distances produced by the master, A. E. Kennedy, and finds that, no matter which way the operation described in the evidence is performed, or by any stretch of imagination, can it agree with the statements made, nor even allowing for the currents, which the master did not take into consideration, would it be possible for him to have been in the position he thought he was from his own reckoning, namely, Flint Island. The fact of his navigating through fog and thick weather for such a long period, and to have come near to a light, and not taken the ordinary precaution of taking soundings to assure himself of the nature and name of the light, and also the fact of his having used the lead, as it is stated he had done on several occasions, and not making any attempt to obtain bottom, but resting satisfied with a cast of 50 fathoms to indicate that he was away from the land, impresses the court with the idea that most careless and reckless navigation had been carried on. Just prior to this voyage, the master was severely reprimanded for the method he adopted in beaching his vessel in the Strait of Belle Isle after striking an iceberg, and that, in conjunction with his present conduct, causes the court to look askance at the statement he had made, and the entries in his log, in view of which the court finds him in default for reckless navigation and suspends his certificate for 12 months from Oct. 27, and owing to the fact that the master was almost constantly on deck, it will not deal with the certificate of the chief officer, John Purdis. With regard to the statements made by the representatives of the salvage companies, it is not within the court's province to reflect on their actions in connection with the non-success of the salvage of this vessel.

Lloyd's Register of Shipping reports that the vessels lost, condemned, etc., for the first quarter of 1914, were, steam 78, with a gross tonnage of 96,630; sailing 73, with a gross tonnage of 49,221. Of the total steam vessels, 19, with a tonnage of 17,847, and of the sailing, 20, with a tonnage of 8,214, were owned in the United Kingdom and the British Dominions.

The British Admiralty has announced that officers of vessels requisitioned for war purposes, holding master's certificates, will be given the temporary rank of sub lieutenants, and second engineers the temporary rank of assistant engineers in the Royal Navy Reserve.

List of Steam Vessels Registered in Canada During October, 1914.

No.	Name	Port of Registry	Where and When Built		Length	Breadth	Depth	Gross Tons	Reg. Tons	Engines, Etc.	Owner or Managing Owner
134492	Jas. R. Langdon	Quebec, Que.	Detroit, Mich.	1889	240 0	42 0	14 9	1489	951	116 n.h p.sc.	Quebec and Levis Ferry Co., Quebec, Que.
134174	Jellicoe	Shelburne, N.S	Allendale, N.S.	1914	49 6	15 7	7 6	25	24	2 " "	W. McMillan, Lo keport, N.S.
134472	Kanawaki	Montreal	Penetanguishene, Ont.	1909	34 9	7 5	2 4	4	3	1 " "	J. B. Stacey, Caughnawaga, Que.
134450	Lasalle	Toronto	Toronto	1914	85 0	15 0	8 8	85	33	16 " "	J. E. Russell, Toronto
122202	Little Dan	Amherst, N.S.	West Bay, N.S	1908	35 0	10 0	4 0	6	4	1 " "	W. A. Downey, Amherst, N.S.
134491	Louis Philippe	Quebec, Que.	Lauzon, Que.	1914	162 0	37 0	11 0	600	251	58 " "	A. C. Davie and G. D Davie, J. O , Levis, Que.
130979	Mariska	Collingwood, Ont.	Cleveland, Ohio	1890	297 0	40 3	21 2	2502	1875	252 " "	W. J. Bassett, Toronto, Ont.

List of Sailing Vessels and Barges Registered in Canada During October, 1914.

No.	Name	Port of Registry	Rig	Where and When Built		Length	Breadth	Depth	Reg. Tons	Owner or Managing Owner
103820	J B. Newland	Belleville, Ont.	Schr.	Manitowoc, Wis.	1870	108 6	26 2	8 2	145	C. Taylor and G. Cousins, J.O., Belleville, Ont.
134381	J. F. Boyd No. 5.	Sault Ste. Marie, Ont.	Scow	Chicago, Ill.	1908	66 0	30 0	6 5	196	J. F. Boyd, Sault Ste. Marie, Ont.
134382	J. F. Boyd No. 6.	"	"	Sault Ste. Marie, Ont.	1914	90 0	30 0	8 5	230	" "
131418	R. & H. No. 1.	Vancouver, B.C.	"	Vancouver, B.C.	1910	59 2	24 0	5 7	73	J. W. Hackett, Vancouver, B.C.

Shipping Report From Fort William.

F. & W. Jones, grain, vessel, and marine insurance brokers, Fort William, Ont., wrote Nov. 15: Coal receipts show a slight decrease in the first half of November, there being 11 cargoes—7 anthracite and 4 bituminous. Despatch is unchanged since our last writing, but, owing to weather, boats are often bunched, and have to wait turn for considerable time. There is a good line-up in sight for the next week, 4 anthracite and 2 bituminous, although more than this is expected before the close of navigation. The stocks of coal at present are approximately:

	Anthracite tons.	Bituminous. tons.
Fort William coal dock.	32,200	302,000
C.P.R. coal dock	200,000	600,000
C.N.R. coal dock	145,000	450,000
Totals	377,200	1,352,000

Grain cargo shipments have shown a distinct contrast to all previous seasons. In place of the harbor being full of vessels loading, with a large line up waiting turn, cargo loading has shown but little activity, and the first half of November shows a considerable drop below the last half of October. Sixty-four cargoes have been shipped east, with a tonnage of 9,467,224 bush. Of these 11 were in United States bottoms and the balance—53— in Canadian bottoms. It will thus be seen that the total tonnage was practically 1,500,000 below the tonnage which left in the cargoes of the last half of October.

There has been no sign of any storage cargoes for the head of the lakes, although several of the Canadian bottoms have gone into storage at the lower lakes. During the last few days there has been an additional enquiry at Winnipeg for space. Shippers appear to be realizing that rates have reached bottom, and that their grain would be preferable at eastern points, where markets are likely to develop. This being so, bidding for space has been somewhat more active.

Attention appears to be now centring upon the preparations for next season's crop. The early harvest has made it possible to make great preparations for next season. Conditions have been most favorable, and excellent progress has ben made. In the five fall wheat provinces of Western Canada it is estimated that over 1,250,000 acres are in preparation for fall sowing. This will be 9½ per cent. advance on last year's sowing. In the three northwestern provinces the fall sowing has slightly decreased, but with the favorable conditions prevailing will show considerably better results than the present season. Comparing the fall plowing of these three provinces with the previous two seasons the prospects are considerably higher, possibly 25 per cent.

Stocks at date, receipts and shipments since Nov. 1, are:

	Stocks.	Receipts.	Shipments.
Wheat	8,116,064-30	3,468,448-00	7,538,948
Oats	1,744,830-28	988,410	1,281,545
Barley	317,908-09	221,903	416,203
Flax	1,183,170-09	245,175	230,528

The Houston Ship Channel, which provides a 25 ft. depth from the Gulf of Mexico to Houston, Tex., was formally opened on Nov. 10, by President Wilson pressing a button in Washington, D.C., which fired a signal in Houston. Wharves, docks and other port appurtenances have not been completed, but a bond issue of $3,000,000 has been approved for that purpose.

The contract for the construction of the concrete substructure of a steel viaduct over the old Welland Canal, near the G.T.R. station at St. Catharines, Ont., has been awarded by the St. Catharines civic works committee to Campbell and Littimer, Toronto, for approximately $21,744.

The Loss of the s.s. Cacouna.

Following is the judgment of Capt. L. A. Demers, Dominion Wreck Commissioner, concurred in by Capt. Neil Hall, Halifax, N.S., and Capt. R. MacDonald, North Sydney, N.S., as nautical assessors in connection with the stranding and subsequent loss of the Dominion Coal Co.'s s.s. Cacouna, at Ferryland Head, Nfld., Sept. 26:—

After reviewing the evidence of the master, J. L. Newman, and the written evidence submitted, the court came to the conclusion that the master committed a grave error of judgment in taking too much for granted as to the course, velocity and direction of the current, and that he also committed an unpardonable mistake in maintaining full speed in a dense fog, thereby contravening the rule of the road which orders that the speed of a vessel shall be diminished in misty or thick weather, and that he failed when not hearing the whistle, which he expected to hear on Aquafortis, to stop his vessel, as, in the court's opinion, he could have done, and taken a sounding in order to ascertain the exact position of his vessel, owing to knowledge of all navigators of the vagaries of the tide on the Newfoundland shore. After taking into consideration that this is his first accident in a long period of service as master, the court suspends his certificate for three months from Oct. 26, and considers it is dealing very leniently with him as the author of the total loss of a valuable vessel.

The s.s. Cacouna was built at Newcastle upon Tyne, Eng., in 1884, and was screw driven by engine of 142 n.h.p. Her dimensions were, length 250 ft., breadth 35.4 ft., depth 16.4 ft.; tonnage, 1,451 gross, 931 register.

British Columbia-Japan-Siberia Service.

The arrival of the Russian s.s. Novgorod, at Vancouver recently, marks a further development of the C.P.R. in its relation to a complete round the world service. The Novgorod sailed from Vladivostock, Siberia, for Vancouver, calling at Japanese ports, where she was handled by the C.P.R. staff. She was scheduled to sail from Vancouver on the return trip, Nov. 25, and the C.P.R. is issuing through bills of lading by her for freight. Passengers will also be booked either way, and it is expected that a large business will develop by this route. Connection is made with the Trans-Siberian Ry. at Vladivostock. In addition to the new business which will develop from the Siberian section, the service will undoubtedly be welcomed just now, since the C.P.R. trans Pacific vessels have all been requisitioned for war service, and the Japanese and Chinese services suspended. The Novgorod will be followed early in December by the s.s. Kiev, and it is stated that a monthly service with these vessels will be given. They belong to the Russian Volunteer Fleet, an organization with about 14 vessels aggregating 75,000 tons, the majority of which have been built either in England or Scotland, and Guthrie and Co. act as agents at Vancouver.

The Canada-Cape Breton Collision.

An investigation into the collision between the Gaspe and Baie des Chaleurs Steamship Co.'s s.s. Canada and the Dominion Coal Co.'s s.s. Cape Breton near the Lachine Canal in Montreal harbor, Oct. 7, was held at Montreal, recently, by Capt. L. A. Demers, Dominion Wreck Commissioner, assisted by Capt. F. Nash and E. C. Sears, as nautical assessors.

The court, after considering the contradictory evidence submitted, found that the master of the s.s. Canada, P. Blouin, showed lack of ordinary judgment in advancing in such a narrow space, where he saw a vessel lying in an oblique way, as that part of the harbor will not permit two vessels to manoeuvre at the same time. The court is at at loss to understand why, when he put his vessel full speed astern, he did not keep her so until she had come to a dead stop, instead, as he admits when he gave the order to stop by telegraph, his vessel was still going three miles an hour, at which she struck the Cape Breton. The excuse that his vessel did not answer her helm as he anticipated cannot be accepted, as he has emphasized the fact that she steers well, and the court finds that there were no elements which could have contributed to a default in the action of the vessel, and there was no tide and an absence of wind. The fact that the whistle was not blown when going astern, though a breach of the rule of the road, was not contributory to the collision. Moreover the court thinks

Sault Ste. Marie Canals Traffic.

The following commerce passed through the Sault Ste. Marie Canals during October.

Articles			Canadian Canal	U. S. Canal	Total
Copper	Eastbound	Short tons	595	12,752	13,347
Grain	"	Bushels	4,865,767	6,665,205	11,530,972
Building stone	"	Short tons	.....	.....	.....
Flour	"	Barrels	282,480	1,122,530	1,405,010
Iron ore	"	Short tons	2,319,012	2,052,276	4,371,288
Pig iron	"	"	2,000	.....	2,000
Lumber	"	M. ft. b.m.	4,440	55,490	59,930
Silver ore	"	Short tons	.....	.....	.....
Wheat	"	Bushels	17,793,087	9,885,063	27,678,150
General merchandise	"	Short tons	820	21,357	22,177
Passengers	"	Number	676	217	893
Coal, hard	Westbound	Short tons	25,900	211,810	237,710
Coal, soft	"	"	295,941	1,313,170	1,609,111
Flour	"	Barrels	.....	.....	.....
Grain	"	Bushels	.....	.....	.....
Manufactured iron	"	Short tons	2,033	16,577	18,610
Iron ore	"	"	3,696	.....	3,696
Salt	"	Barrels	2,149	83,371	85,520
General merchandise	"	Short tons	40,870	87,177	128,047
Passengers	"	Number	368	475	843
Summary.					
Vessel passages		Number	754	1,755	2,509
Registered tonnage		Net	2,079,123	3,759,562	5,838,685
Freight—Eastbound		Short tons	2,987,477	2,742,541	5,730,018
" —Westbound		"	368,747	1,641,240	2,009,987
Total freight		"	3,356,224	4,383,781	7,740,005

that a total observance of the rule of the road at that particular place cannot be expected, yet it was the master's duty to have brought his vessel to a full stop, when a few hundred yards from the Cape Breton, and waited until she had either headed down stream or entered the locks, especially as the Canada had seen the Cape Breton towed out from the berth near the one she intended to enter. In view of these reasons the court severely reprimands the master for his lack of prudence and judgment and orders him to pay the total cost of the enquiry to the Department of Marine by Dec. 15. The costs are made up as follows:—Two assessors, 4 days at $10 a day, $40; travelling and living expenses of Wreck Commissioner, two trips Ottawa to Montreal, Nov. 8, 9 and 10, and Nov. 17 and 18, $47; stenographer's fees, $140.34. Total, $187.34. The master and pilot of the s.s. Cape Breton are exonerated from all blame.

It was ascertained that both masters moved their vessels within the harbor without first having notified the harbor master. There is a bylaw regulating the movements of vessels within the harbor. In view of the limited space available, it is imperative that this bylaw be strictly adhered to, and the court brings this infraction to the Harbor Commissioners' attention, as in the court's view, had the collision been of a more serious nature, it might have impeded traffic and caused serious losses to the shipping interests, besides affecting the reputation of the port.

Atlantic and Pacific Ocean Marine.

Canada Steamships Line s.s. Bermudian, which was engaged in conveying Canadian troops to England, recently, and which was reported to have been further requisitioned by the British Admiralty to take troops from England to India, returned to New York, Nov. 5.

A press report from Montreal states that next season will see a new steamship line running between Montreal and England in competition with the North Atlantic pool, and that this line will be incidental to a co-operative enterprise which is being organized in Montreal.

A press dispatch from London, Eng., states that Furness Withy and Co., whose headquarters have been at West Hartlepool, Eng., from the inception of the company, will remove to Liverpool in the new year, chiefly owing to the considerable development in the company's Atlantic business .

The Red Star Line s.s. Zeeland, one of the vessels utilized recently in the conveying of the Canadian contingent to Europe, and now running in the White Star-Dominion Line service, ran aground in Lake St. Peter, Nov. 13. It was stated that she was on soft bottom and would suffer no damage. She was released Nov. 16.

Manchester Liners s.s. Manchester Commerce, which struck a mine recently, near the Irish coast, and sank with her crew, while bound from Manchester, Eng., to Montreal, was valued for marine insurance at £54,000, and her cargo was worth approximately £100,000. She was built in 1899, and was of 5,363 gross tons.

It is reported that since the transportation of the Canadian contingent to England, the British Government has requisitioned the C.P.R. steamships Montezuma, Ruthenia and Tyrolia, which were engaged in that service, for further service, and has also requisitioned the company's steamships Lake Manitoba, Montcalm and Mount Royal .

It is reported that the British Admiralty has agreed to pay the White Star Line, $3,000,000, for the loss of the s.s. Oceanic, which was wrecked and lost recently on the north coast of Scotland while under requisition for war purposes. The commander of the Oceanic has been court-martialled and found guilty of negligence in the loss of the vessel.

The Mersey Docks and Harbor Board, Liverpool, England, gives notice that strict attention must be paid to the regulations in force for the defence of the River Mersey and issued by Brigadier-General Edwards, Commanding the Mersey Defences. Inward and outward traffic through the Rock Channell has been forbidden, and all ships, steamers, and craft of every kind must pass through the examination anchorage.

It was announced in Ottawa recently, that in conformance with the recommendation of the commission which enquired into the loss of the s.s. Empress of Ireland, the regulations regarding the taking on and dropping of pilots in the St. Lawrence will be changed at the reopening of navigation in the spring. It has hitherto been the practice for pilots to be taken on and dropped at Father Point, and this is considered dangerous. From the reopening of navigation, the point at which pilots will be dropped will be some four or five miles from where pilots are taken on. The change has been decided on for some time but it was not deemed advisable to make it in the middle of the season.

Very distinct warnings have been given recently to those who are, or may be, assisting German firms to continue their businesses by means of a temporary transfer to agents, or servants, or by other means. In this connection the proclamations have been very clear as to the duties of all British subjects, and it should be impressed on all concerned that it is to their ultimate advantage to see that the terms of the proclamations are carried out. A statement emanating from New York recently, states that there are at present in Liverpool, Eng., two or three German forwarding firms, which are now handling British made and British owned goods, having as their destinations the British Colonies and the United States. It is stated that these firms undertook the conveyance of goods at through rates from German manufacturing points to Canada and the U. S., via Great Britain, shipping from Liverpool, London and Southampton, in competition with the German direct lines, and that if these businesses are discontinued, the employes, most if not all of whom are British subjects, will be thrown out of work. The statement and its conclusion seems to be rather loosely built, as apparently the firms are handling British goods, and therefore their undertaking to convey goods from German manufacturing points via Great Britain in competition with the German direct lines, does not affect the matter. The conclusion that if these businesses are discontinued, the employes will be thrown out of work, does not necessarily follow, as most probably the business would flow through other channels, and the employes would soon be reabsorbed. It is clear that trading with or assisting the enemy should cease.

Maritime Provinces and Newfoundland.

It is announced that the Puhlic Works Department will take no action on the tenders received recently for repairs to the eastern pier at Newcastle, N.B.

An application was made recently at Portland, Me., for the appointment of a receiver for the Eastern Steamship Corporation, a subsidiary of the New York, New Haven and Hartford Rd. This is said to he the first step in the reorganization of the company, which operates a steamship line between Boston, Mass., and St. John, N.B.

It is reported at St. John, N.B., that a company will probably be formed there during the winter to acquire the s.s. Victoria, at present owned by F. Clements, St. John, and E. G. Hoben, Fredericton, for operation on the Grand Lake route. This vessel has been running on the St. John River for some years. She was built at St. John in 1897, and is paddle wheel driven by engine of 53 n.h.p. Her dimensions are, length 191.2 ft., breadth 30 ft., depth 7.9 ft.; tonnage, 1,002 gross, 631 register.

At a meeting of the Halifax Board of Trade, recently, it was reported that a deputation had waited on various steamship companies and also on the Dominion Government, regarding steamship and mail service for the winter, and that though it had not succeeded in securing the whole of the mail service for the port, a promise had been obtained from one of the largest steamship companies, that Halifax would be utilized during the winter. The Government did not feel able to make any statement about the mail service, on account of the number and class of vessels which have been requisitioned by the British Admiralty for war purposes.

The Governor General in Council has confirmed a bylaw of the pilotage authority of St. John District, providing that no pilot shall board a vessel to pilot her inward except from a licensed pilot boat approved by the pilotage authority, unless on an application for the naming of a particular pilot to be permitted to board a vessel, in which case the pilot must have on his person such written permit, and he shall lose his next turn on the pilot boat to which he is attached. Any pilot speaking a vessel with a pilot on board who has gone on board without a permit shall be entitled to the pilotage of the vessel and not the pilot improperly employed.

Province of Quebec Marine.

The name of the steamboat James R. Langdon, no. 134492, registered at Quebec, has been changed to Charles A. Shaw.

The s.s. Gladstone when entering Windmill Point basin, Montreal, Nov. 3, collided with a barge on which some men were working in fitting a propeller on the s.s. Jessamore, and sank her. The owners of the barge, the Hall Engineering Works, have taken action against the s.s. Gladstone for $3,000 damages.

The naval station which was established for the inspection of incoming and outgoing vessels, at River Maheux, Isle of Orleans, in the St. Lawrence, has been closed for the winter. The Dominion Government revenue steamship Margaret, which was on duty there, has been sent to Halifax for general duty in connection with transports.

The Quebec Harbor Commissioners received a new grain harge from England, at the end of October, the voyage having taken 42 days. The vessel is being used to convey grain from the commissioners' elevator on the Louise embankment to vessels outside the breakwater, thus allowing them to take grain without leaving their berths.

The Quebec Harbor Commissioners are suing the New Zealand Shipping Co. for $35,000 for damage alleged to have been done to Gilmour's wharf, at Indian Cove, by the company's s.s. Whakatane, when it collided with the wharf on Sept. 15, 1913. Part of the defence is that as the vessel was in charge of a licensed pilot the company is absolved of responsibility.

The two freight sheds which the C.P.R.

is building at Quebec are approaching completion, and it is reported that they, together with the necessary tracks for their operation will be ready for service by March, 1915. The inner shed for incoming freight is 600 by 50 ft., and the outer shed for outgoing freight is 400 by 30 ft., both being of reinforced concrete construction.

The Montreal Harbor Commissioners will, it is announced, commence work on the erection of its additional grain elevator, early in the spring. In the meantime such work as is necessary to prepare for the construction, such as the diversion of the Elgin basin sewer, demolition of old buildings on the site, and certain excavations, will proceed. The elevator will cost approximately $800,000.

It is reported that the keel of the Dominion Government icebreaker for the St. Lawrence River service is being laid at the Canadian Vickers plant at Maisonneuve. The plant was expected to be completed by the end of November. The shipbuilding shed, which is finished, is 300 ft. long, and there the icebreaker will be built. It is anticipated that she will be ready for service by June, 1915, the work proceeding right through the winter. It is said that the greater part of the vessel's machinery is being made at the company's English plant, and that it will be shipped to Canada ready for placing in the hull, when the latter is ready for launching.

Canada Steamship Lines s.s. Louis Phillippe, of which some particulars were given in our last issue, was delivered to the company by the builders, Oct. 20. She is intended for the Montreal and Longueuil ferry service, and will be placed on the route as soon as the dredging on the Longueuil side of the river is finished. She is equipped with fore and aft compound engines, supplied with steam by one boiler 12½ by 12½ ft., fitted with 3 furnaces, and working at 125 lbs. pressure. Her dimensions are, length over all 169½ ft., length over stem and stern posts 157 ft., beam extreme over wales 43 ft. 2½ ins., beam moulded on frame 37 ft., depth moulded at side 12¼ ft.

A series of trials in the loading and unloading of the N.T.R. car ferry Leonard, was made at Quebec at the end of October. The vessel was taken from Pointe a Carcey wharf, where she has been moored since her arrival from England, to the new wharf at Lampsons Cove. At this point railway tracks had been laid, and cars loaded with stone, etc., were run on to the ferry and removed again. The test was made with 21 cars placed on the three tracks on the railway deck, these with their contents weighing about 1,250 tons. As the wharf on the south side of the river at Windsor Cove was not finished, the ferry was not taken across the river, but after being unloaded she returned to the Louise Basin. It was anticipated that the accommodation on both sides of the river would be completed and the ferry placed in service towards the end of November.

Ontario and the Great Lakes.

The Toronto Harbor Commission will, it is reported, build a large restaurant at Sunnyside in the spring, and operate a boat hiring business in connection.

A steel steam tug, 75 ft. long, for use on the Toronto harbor development, was launched from the Thor Iron Works, Toronto, early in November.

Lightship 96, a steel vessel, is being fitted out at Detroit, Mich, to take the place of the old wooden lightship on the Corsica shoal at the south end of Lake Huron.

The Dominion Marine Department has awarded a contract for the construction of a lighthouse at the entrance to the Livingstone Channel in the Detroit River, to A. T. C. McMaster, Toronto, for $14,500.

Canada Steamship Lines s.s. W. Grant Morden touched bottom in the St. Clair River, Nov. 4, in the middle ground between Sarnia and Port Huron. This was the second grounding by the same vessel in the river on the same trip. The damage was stated to be inconsiderable.

A press dispatch from Sarnia states that owners of various wrecks in Sarnia Bay have been notified by the Government that they must at once remove them, so that work may be started on the harbor works. It is stated that there are wrecks of five sailing vessels and one steamship in the way.

The Reid Wrecking Co.'s s.s. Colonial was driven ashore near Pardoville, while en route from Oswego to Milwaukee with coal, Nov. 12. It was reported, Nov. 16, that the heavy weather of the preceeding two days had broken her up considerably and that she was a total loss.

The steamboat Manita, which has recently been operated between Lindsay and Sturgeon Point, is reported to have been sold to the Stoney Lake Navigation Co., and it is stated that she will be run, next season, between Peterborough and Stoney Lake points by way of the Trent Valley canal, in conjunction with the steamboats Empress, Islinda and Stoney Lake.

The St. Clair Conservation Co., Ltd., has been incorporated under the Ontario Companies Act, with an authorized capital of $300,000 and office at Sarnia, to own and operate pleasure grounds, hotels, etc., and in connection therewith to own and operate steam and other vessels, with the necessary wharves, docks and terminal facilities. The provisional directors are:— C. A. White, J. T. Fuller and S. Cowan, Sarnia.

The United States Lake Survey reports the levels of the Great Lakes in feet above tidewater for October, as follows:—Superior 602.75; Michigan and Huron 580.28; Erie 572.10; Ontario 245.59. As compared with the October levels for the past ten years, Superior was 0.03 ft, above; Michigan and Huron 0.38 ft. below; Erie 0.08 ft. below, and Ontario 0.41 ft. below. It was anticipated that during November, Superior would drop 0.2 ft., and Michigan, Huron, Erie and Ontario 0.3 ft.

J. W. Norcross, General Manager, Canada Steamship Lines, is reported to have stated in an interview in Montreal recently that the company's earnings during the past few months were better than anticipated. Any forecasts for the future were, however, impossible owing to the general conditions prevailing. He considered that there was a possibility of a good portion of the crop remaining in the west until the spring, in which case the lake steamships would reap considerable benefit.

At a meeting of the joint committee of the International Waterways Commission at Detroit, Mich., Nov. 11, the chief matter dealt with was the question of the pollution of the water in the Great Lakes, the responsibility for which is disputed by both the municipalities adjacent to the lakes, and by steamship owners, each blaming the other. The vessel owning interests claim that vessels do not to any considerable degree contribute to the water pollution, while the municipalities state that there is but one cause for the contamination at times, and that is the discharge of water from steamboats, and at Sault Ste Marie, when large numbers of vessels anchor for shelter during storms, etc., the pollution is claimed to be very noticeable.

The Bassett Steamship Co., Ltd., Toronto, a recently incorporated company, has purchased the s.s. Mariska from the Pittsburg Steamship Co., Pittsburg, Pa., and has transferred her to the Canadian register. The s.s. Mariska was built at Cleveland, Ohio, in 1890. She is of steel with watertight double bottom for ballast, steel boiler house, three watertight bulkheads and two non watertight bulkheads, three cargo compartments with hatches spaced 24 ft. centres. Her dimensions are:—Length over all, 297 ft.; length between perpendiculars, 291 ft.; breadth moulded, 40 ft.; depth moulded, 22 ft.; tonnage, 2,325 gross, 1,835 register. She is equipped with triple expansion engines with cylinders 24½, 38 and 61 by 42 ins., with 1,200 i.h.p. at 80 r.p.m., supplied with steam by two Scotch boilers, 14 ft. diar. by 12½ ft. long, with 6 furnaces, 126 sq. ft. grate surface, 5,292 sq. ft. heating surface.

The Mayor of Owen Sound received a letter recently from F. F. Wood, the promoter of the dry dock and shipbuilding plant there, which stated that the plans for the dry dock were about to be filed with the Public Works Department at Ottawa, that the money necessary for the carrying on of the work had been secured, and that the people of Owen Sound might be assured that the dock will be built. He also stated that it was possible that something towards the securing of the site would be done during November. It is reported that representatives of some New York financiers have been in the neighborhood recently looking for a site for a dry dock, and making efforts to interest local capital in such a venture, but Mr. Wood states that they have nothing to do with the concern in which he is interested. There would thus appear to be two schemes before the people.

Manitoba, Saskatchewan and Alberta.

The names of the steamboats Phyllis Williams and Rosamund Billet, registered at Winnipeg in the name of the Lake Winnipeg Shipping Co., have been changed to Limestone City and City of Winnipeg, respectively.

The season for navigation in Hudson Bay which was closed towards the end of October, is reported to have been without accident. In the previous year a number of accidents occurred, but since then the Marine Department has established a number of aids to navigation, which have rendered the route practicable and safe for traffic. Several vessels were on the route during the season taking cargo to Port Nelson up to September, and a large staff of men was employed, and will continue so during the winter, on the terminal work at Port Nelson.

British Columbia and Pacific Coast Marine.

The Grand Trunk Pacific Coast Steamship Co. has moved its Seattle, Wash., office to 917 Second Ave.

The steamboat Helen M. Scanlon, registered at Vancouver, has had its name changed to Wm. H. Ladner.

A Vancouver press despatch states that the Boston-Pacific Steamship Co. will inaugurate a steamship line between Boston and Vancouver shortly.

The C.P.R. s.s. Princess Royal, which struck a rock in the Sabine Channel towards the end of October, was repaired at Victoria early in November. While she was undergoing repair the s.s. Princess Maquinna took her route.

The Dominion Government survey steamer Quadra has been completely overhauled at Esquimalt, the work covering the hull and

all equipment, the lifting of the main engines, and the re-riveting of the tank top and engine foundations.

The Dominion Government lighthouse and buoy vessels Estevan and Leebro sailed recently from Victoria, the former for Queen Charlotte Islands, and the latter for Prince Rupert, to attend to the lighthouses and buoys on the routes.

An Ottawa press dispatch states that the western portion of the Broughton Strait, near Vancouver Island, has been closed to navigation, and that vessels between Johnston Strait and Queen Charlotte Sound must take the Wenton Passage and Blackfish Sound.

The C.P.R. s.s. Princess Irene, sister of the recently launched s.s. Princess Margaret, has been launched at Dumbarton, Scotland. It is anticipated that both of these vessels will be on the Pacific Coast for service early in the spring.

The Government breakwater and piers at Victoria are in the stage where work begins to show above water level. Pouring has commenced on the first two of the concrete cribs, which are to be floated into place and sunk in position as foundations for the superstructure.

C. H. Nicholson, General Manager, Grand Trunk Pacific Coast Steamship Co., Vancouver, who was in Montreal recently, is reported to have stated that he had received authority for the preparation of plans for a new dock at Seattle, Wash., to replace the one damaged by fire a short while ago.

At New Westminster there is nearing completion the first unit of an extensive scheme, to cost many millions, for the development of a harbor in the Fraser River. Features of this work are the methods of handling material by 150 h.p. electric cranes and a dipper dredge, which were built especially for the work and are supplemented by a Fruhling dredge rented from the Dominion Government.

A press dispatch from Vancouver stated recently that H. H. Stevens, M.P., had announced that he had successfully concluded special arrangements with the Pacific Dredging Co., which holds the contract for the harbor improvement works in False Creek, for the excavation of a 10 ft. channel in the creek between the Connaught and Granville St. bridges in advance of the main work in that waterway, making the channel navigable for tugs, scows and coasting vessels earlier than was originally planned.

Mainly About Marine People.

WM. LAURIE, a government steamboat inspector at Montreal, died suddenly, of heart trouble, at his home at Westmount, Que., Nov. 12, aged 69.

J. W. GEDDES, Traffic Agent, Canada Steamship Lines, Lewiston, N.Y., whose body was recovered from the Niagara River recently, after he had been missed for several days, had been suffering from a heart affection, and it is feared that he was seized with an attack and fell into the river.

CAPT. F. CAREY, until recently commander of the C.P.R. s.s. Tyrolia, and formerly commander of the same company's s.s. Empress of Ireland, received a presentation at Liverpool, Eng., Nov. 17, in commemoration of his fifty years service at sea. During this period he crossed the Atlantic about 600 times.

LIEUT. KENDALL, R.N.R., who was in command of the C.P.R. s.s. Empress of Ireland when she went down in the St. Lawrence, and who, on the outbreak of war, was appointed Lieutenant Naval Commander of the s.s. Calgarian, which had been requisitioned by the Admiralty, has been advanced to the rank of Commander of that vessel.

J. G. SING, M. Can. Soc. C.E., District Engineer, Dominion Department of Public Works Department, Toronto, resigned Nov. 17. During the ten years he held the position he had charge of all the harbor work in eastern and northern Ontario, covering practically the entire waterfront along the Great Lakes.

The death of ROBT. THOMSON, head of the steamship firm of Wm. Thomson & Co., of St. John, N.B., has severed one of the few links that remained between the days of wooden sailing ships and the age of steel and steam. In the former days the sails of the Thomson ships were to be seen on all the seven seas. The firm was quick to recognize the advancing age of steel and steam, and was among the first Canadian ship owners to initiate a line of freight steamships of its own. The present Battle line steamships have all carried the Thomson house flag. Mr. Thomson left an estate of $343,000 besides life insurance.

Telegraph, Telephone and Cable Matters.

Robert Bain, who has been acting as relieving superintendent for the Pacific Cable Board at Suva, has resumed his permanent post of assistant superintendent at Bamfield, B.C.

R. V. Aubin, heretofore night chief operator, Great North Western Telegraph Co., Ottawa, Ont., has been appointed local manager, Quebec, vice F. D. Boomer, transferred to Ottawa, Ont.

It is reported that an Italian priest has perfected a portable wireless telephone receiver, which at a recent demonstration proved its practicability by intercepting a prepared message between Rome and London.

The Grand Trunk Pacific Telegraph Co., since 1907 has erected 3,156 miles of pole line and 12,396 miles of wire, of which 50% is of copper, west of Winnipeg. All trains will be dispatched by telephone, the equipment for which is now on order.

F. D. Boomer, heretofore local manager, Great North Western Telegraph Co., Quebec, has been appointed local manager, Ottawa, Ont., vice C. E. Davies, who was appointed Traffic Superintendent, Toronto, in July.

The British Post Office Department has announced that it is willing to consider placing orders in Canada for the larger size of telegraph poles. It is reported that the competition of Russia and Norway would prevent Canada getting orders for the smaller poles.

R. Hicks, heretofore chief operator, Grand Trunk Pacific Telegraph Co., Edmonton, Alta, has been transferred to a similar position at Winnipeg, and has been succeeded at Edmonton by R. M. McMillan. S. Hutchison, who was in charge at Winnipeg, has been transferred to Prince Rupert.

The Great North Western Telegraph Co. has opened offices at Burgessville, Gorrie, Hespeler, Kemptville and Port Burwell, Ont., and has closed its offices at Capucins, Deschaillons, Gentilly Lake St. Joseph Hotel, St. Pierre les Becquets, Valcartier Camp and Valcartier rifle range, Que. The name of its office at Stanfold, Que., has been changed to Princeville.

The Grand Trunk Pacific Telegraph Co. is endeavoring to reduce the volume of railway service messages over its lines. A recent bulletin on this subject points out the advantages of brevity in service messages, and instructing that the telegraph should be used only for really urgent and important messages. It also stated that a perusal of messages sent over the wires indicated very clearly that a large number of messages would have served the company's purposes equally well if sent as traingrams.

The cable station erected at Bay Roberts, Nfld., recently, by the Western Union Telegraph Co., is of fireproof construction, of cement, tile and structural steel throughout, including the roof and floors. Three cables to Great Britain and three to Nova Scotia and New York, all of which are landed at Conception Bay, are operated from this station. Accommodation for the staff is provided in nine dwelling houses for the married men and a house with accommodation for 22 members of the staff.

The Pacific Cable Board advised, Nov. 5, that the Pacific cable between Canada and Australia, and the cable station at Fanning Island, have been repaired, and communication has been restored. The damage was caused by the German cruiser Nurnberg, which is still cruising in the Pacific Ocean. The statement of the islanders is to the effect that the Germans effected a landing under cover of the French flag and smashed all the instruments, and dynamited the engine, boiler and dynamo rooms and refrigerating plant, as well as the cable. All papers of any value were removed, and the office safe was blown open and about $3,000 taken. The damage is estimated at about $150,000.

The Commercial Cable Co.'s office at Waterville, Ireland, is being protected against any possible attack. The building is completely enclosed by a barbed wire fence, and a sentry patrols the ground inside. At the office door is another sentry, and all persons entering or leaving the office must show him a pass. The battery and testing rooms in the basement are blocked up with sand bags, and preparations are being made for a bullet proof protection for the windows of the operating room, consisting of galvanized iron and timber. When this is completed all operating will be done with artificial light. The cable at the point of landing is also protected with barbed wire and guarded, and an additional guard is maintained at the engine house. Other important points are to be protected with bullet proof guards.

Commercial telegraph service was inaugurated by the Grand Trunk Pacific Telegraph Co. to and from Prince Rupert, B.C., Nov. 12. Previously such service had only been in effect as far west as Prince George, B.C., 468 miles east of Prince Rupert. By the extension of this service, such important places as Smithers, Hazelton and Prince Rupert are afforded a cheaper means of telegraphic communication. The first commercial message was filed at Prince Rupert by the Mayor, and was addressed to the Mayor of Winnipeg, Man., containing greetings, and was responded to by its recipient. Commercial telegraph service is now in operation over all G.T.P.R. lines, serving among other important places:—Fort William, Ont., Winnipeg Man., Regina, Moose Jaw, Saskatoon, Sask., Calgary, Edmonton, Alta., Prince George and Prince Rupert, B.C. The construction of the telegraph lines has from the commencement been under the management of A. B Smith, Manager of Telegraphs, G.T.R. and G.T.P.R., Montreal, his chief assistants being H. Hulatt, Commercial and Traffic Superintendent, Winnipeg, and W. J. Rooney, Superintendent of Plant, Winnipeg.

The Edmonton, Alberta, City Council is being asked to extend the date fixed for the opening of the Grand Trunk Pacific Ry. hotel in the city to April, 1915.

Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time we wish our readers distinctly to understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

Robert W. Hunt & Co., Ltd., Engineers, Bureau of Inspection, Tests and Consultations, Montreal, have issued an alphabetical list of railway, structural and other material which they inspect.

H. M. SPERRY, M. Am. Soc. C.E., for many years Sales Engineer, General Railway Signal Co., Rochester, N.Y., has been appointed Manager of the department of publicity and education organized by the company recently.

F. H. Hopkins and Co., railway and contractors supplies, Montreal, has reorganized, J. J. Rosevear retiring on account of ill health. The other partners, F. H. Hopkins and R. A. C. McNally, continue the business under the old style.

American Locomotive Co.—H. C. Hequembourg has resigned as General Purchasing Agent. Until further notice the purchasing and storekeeping departments will be under the jurisdiction of Leigh Best, Vice President.

Canadian General Electric Co., Ltd., Toronto, has issued the following publications: —Bulletin 44565, variable release air brake equipment; bulletin 44300, gas electric cars; 44003, modern electric railway apparatus; B3292, attractive lighting of business streets.

Flannery Bolt Co., Pittsburg, Pa., manufacturers of the Tate flexible stay bolt, have appointed Chas. Hyland as boiler expert, to succeed T. R. Davis, deceased. Mr. Hyland was for many years foreman boiler maker of the Michigan Central Rd. shops at Jackson, Mich., and was also employed on the Lake Shore Ry. in a similar capacity.

COMMERCIAL FURNITURE FOR TICKET CASES AND
of all descriptions to stock or special design, apply to
The Canadian Office and School Furniture Co., Limited
Preston **Ontario**

CANADIAN PACIFIC RAILWAY COMPANY.

Dividend Notice.

At a meeting of the Board of Directors, held today, a dividend of two and one-half per cent. on the Common Stock for the quarter ended 30th September last, being at the rate of seven per cent. per annum from revenue and three per cent. per annum from Special Income Account, was declared payable on 2nd January next to Shareholders of record at 3 p.m. on 1st December next.

By order of the Board.

W. R. BAKER,
Secretary.

Montreal, 9th November, 1914.

W. W. Butler Co., Ltd., railway supplies, etc., Montreal, announces that E. G. Jackson, late General Sales Manager of Canadian Car and Foundry Co., Ltd., Canadian Steel Foundries, Ltd., and Pratt & Letchworth Co., Ltd., has returned from Europe, and has assumed the position of Vice President and General Manager of the W. W. Butler Co., with head office at Transportation Building, Montreal.

M. Beatty & Sons, Ltd., manufacturers of dredges, hoisting machinery, etc., Welland, Ont., have made a change in their Toronto representation, by opening a district office in the Builders' Exchange, 154 Simcoe St., in charge of K. M. McKee, formerly of the head office, who will attend to the business in Toronto in future, instead of it being handled by H. W. Petrie, Ltd., as heretofore.

Transportation Associations, Clubs, Etc.

The names of persons given below are those of the secretaries unless otherwise stated.

Canadian Car Service Bureau. J. Reilly, Manager, 401 St. Nicholas Building, Montreal.

Canadian Electric Railway Association, Acton Burrows, 70 Bond Street, Toronto.

Canadian Freight Association (Eastern Lines), G. C. Ransom, Canadian Express Building, Montreal.

Canadian Freight Association (Western Lines), W. E. Campbell, 502 Canada Building, Winnipeg.

Canadian Railway Club, J. Powell, St. Lambert, Que. Meetings at Montreal, 2nd Tuesday each month, 8.30 p.m., except June, July and August.

Canadian Society of Civil Engineers, C. H. McLeod, 176 Mansfield St., Montreal.

Canadian Ticket Agents' Association, E. de la Hooke, London, Ont.

Central Railway and Engineering Club of Canada, C. L. Worth, 409 Union Station, Toronto. Meetings at Toronto, 3rd Tuesday each month, except June, July and August.

Dominion Marine Association, F. King, Counsel, Kingston, Ont.

Eastern Canadian Passenger Association, G. H. Webster, 54 Beaver Hall Hill, Montreal.

Engineers' Club of Montreal, R. W. H. Smith, 9 Beaver Hall Square, Montreal.

Engineers' Club of Toronto, R. B. Wolsey, 94 King St. West, Toronto.

Great Lakes and St. Lawrence River Rate Committee, Jas. Morrison, Montreal.

International Water Lines Passenger Association, M. R. Nelson, New York.

Niagara Frontier Summer Rate Committee, Jas. Morrison, Montreal.

Nova Scotia Society of Engineers, A. R. McCleave, Halifax, N.S.

Quebec Transportation Club, A. F. Dion, Quebec.

Ship Masters' Association of Canada, Capt. E. Wells, 45 St. John St., Halifax, N.S.

Toronto Transportation Club, W. A. Gray, 143 Yonge St., Toronto.

Western Canada Railway Club, Louis Kon, Box 1707, Winnipeg. Meetings at Winnipeg, 2nd Monday each month, except June, July and August.

The employes of the Edmonton, Dunvegan and British Columbia Ry., and of the Alberta and Great Waterways Ry., have contributed $1,300 to be divided between the national and the local patriotic funds.

TRAFFIC EXPERT WANTED.

Traffic expert desiring extra employment for a few hours per week may apply to Box 67, Canadian Railway and Marine World. Must be familiar with freight business conditions, rates, etc., in Ontario. State experience.

Transportation Conventions in 1914-15.

Dec. 1-4.—American Society of Mechanical Engineers, New York.
Dec. 8, 9.—Association of Transportation and Car Accounting Officers, Richmond, Va.
Jan. 19-21.—American Wood Preservers' Association, Chicago, Ill.
Mar. 16-18.—American Railway Engineering Association, Chicago, Ill.
April.—American Association of Demurrage Officers, Boston, Mass.
Apr. 28.—Association of American Railway Accounting Officers, Atlanta, Ga.
May.—Association of Railway Claim Agents, Galveston, Tex.
May.—Railroad Master Tinners', Coppersmiths' and Pipefitters' Association.
May 4-7.—Air Brake Association, Chicago, Ill.
May 17-19.—Railway Storekeepers' Association, Chicago, Ill.
May 17-20.—International Railway Fuel Association, Chicago, Ill.
May 20-21.—American Association of Railroad Superintendents, San Francisco, Cal.
May 21-24.—American Association of Freight Agents, Richmond, Va.
May 26-28.—Master Boiler Makers' Association, Chicago, Ill.
June 9-11.—American Railway Master Mechanics' Association, Atlantic City, N.J.
June 14-16.—Master Car Builders' Association, Atlantic City, N.J.
June 15.—Train Dispatchers' Association of America, Minneapolis, Minn.
June 16.—Freight Claim Association, Chicago, Ill.
June 22-25.—Association of Railway Telegraph Superintendents, Rochester, N.Y.
July.—American Railway Tool Foremen's Association.
July 14-17.—International Railway General Foremen's Association, Chicago, Ill.
Aug. 17.—International Railroad Master Blacksmiths' Association, Philadelphia, Pa.
September.—Roadmasters' and Maintenance of Way Association.
Sept. 14-17.—Master Car and Locomotive Painters' Association of the United States and Canada, Detroit, Mich.
Sept. 21-24.—Railway Signal Association, Salt Lake City, Utah.
October.—American Association of Dining Car Superintendents.
October.—American Railway Bridge and Building Association.
Oct. 4-8.—American Electric Railway Association, San Francisco, Cal.

James Rowens, a steamship ticket agent at Toronto, was committed for trial there Nov. 6 on a charge of high treason. It is alleged that he attempted to pass a number of Austrian reservists out of the Dominion via the United States by representing them as Roumanians. This is the second case on precisely the same lines which has occurred in Canada during the war. The extreme penalty is death.

Coal and ash handling conveyors, belt conveyors, structural steel, heavy machine and foundry work, coal mine bankheads and screening plants, mine fans, etc.
Engineers and Contractors
THE EASTERN STEEL CO., LTD.
Formerly the Brown Machine Co., Ltd. and Bailey-Underwood Co., Ltd.
New Glasgow : : : Nova Scotia

NOTICE.

The General Railway Signal Company of the United States of America, the owner of the exclusive rights to Canadian patents No. 92323, No. 93127, No. 96256, and No. 97758, issued to Young and Townsend, and covering methods of signalling electrified railways, wishes to call the attention of all possible users of the devices and systems covered by such patents to the fact that it is prepared to sell and furnish, at short notice, all such devices and to install such systems upon any railway in the Dominion of Canada.

All inquiries regarding the above should be addressed to The General Railway Signal Company of Canada, Limited, Lachine, Province of Quebec, Canada.

CHICAGO CAR HEATING CO.
VAPOR SYSTEM AND STEAM HEAT SPECIALTIES.
CANADIAN FACTORY AND OFFICE—61 DALHOUSIE ST., MONTREAL ***A. D. BRUCE, Agent***
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WASHINGTON, D.C., MUNSEY BLDG.

TATE FLEXIBLE STAYBOLTS

Allow for and accommodate the forces of expansion and contraction along the lines of least resistance.

The Tate Bolt can be longitudinally adjusted to compensate for the difference of expansion of Outer Boiler Shell over Fire Box.

Over 5,000,000 in service

THE RECOGNIZED STANDARD OF FLEXIBLE STAYS

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PATRIOTISM

There are Heroes of Business—as well as Heroes of Battle. Patriotism can be practised by giving employment to the workers who must remain at home to keep alive Canadian industry.

When you buy Canadian-made goods you help Canada.

When you buy foreign-made goods in preference to Canadian manufactures, you help foreign labor. And you increase the number of Canadians who may later need **public** help.

Support Canada—insure Canadian prosperity—by using only CANADIAN-MADE goods.

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are made in Canada—by Canadian mechanics for Canadian use.

Their manufacture will not be hindered by war.

Big stocks are in our warehouse and on dealers' shelves everywhere for immediate use. 50,000,000 per year are now required to meet the demand.

Use Nicholson-Made Files. The Only Canadian-Made Files

NICHOLSON FILE COMPANY, PORT HOPE, ONTARIO

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STRAIGHT LINE
COMPROMISE OR STEP
INSULATED FOR SIGNALS

Atlas Tie Plates **Atlas Rail Braces**

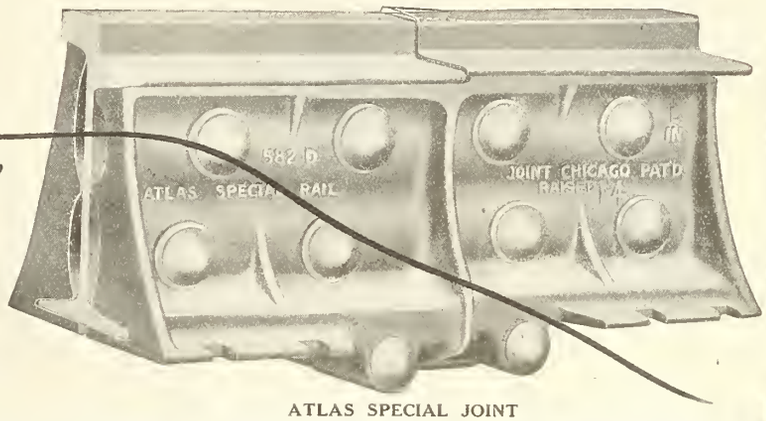
Atlas Special Joint—NOTE CUT

for pounded rail made to fit any style rail

Tee or Girder

Raises the worn or cupped rail to the level of the adjoining rail and holds it there. The rail is then ground even as shown. ATLAS SPECIAL JOINT made either suspended or supported. Ask for circular A-52.

Dotted line shows the worn rail before it is ground off. This will renew the life of your rails.



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Atlas Railway Supply Co.

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1523-1527 MANHATTAN BUILDING

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Pacific Coast Agents: Eccles & Smith
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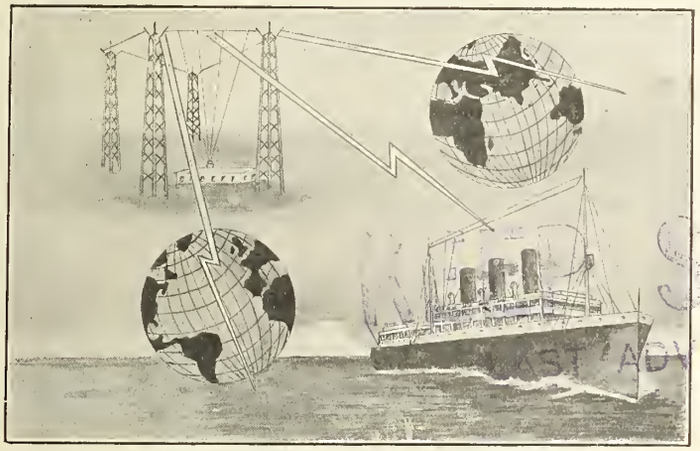

THE WORLD-WIDE WIRELESS.

We supply installations on Land, Ship, Railway and Aeroplane. Sets range from 50 to 2,000 miles.

DEMONSTRATED

That Merchant and Pleasure Craft cannot afford to be without a **MARCONI EQUIPMENT.** Every passenger steamer worth the name is now equipped with Marconi Wireless. Over 1,800 vessels now equipped.

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PAGE CONCRETE REINFORCEMENT

IN FLAT SHEETS

Can be supplied in rolls if preferred.

FOR CONCRETE ROAD PAVEMENT, WALKS, BUILDING FLOORS, ETC.

We are the **originators** of this wire reinforcement in flat sheets, and it is coming into universal use wherever introduced. We have supplied many carloads of it this past season.

The standard mesh for road pavement is 6 x 12 inches; for bridges and building floors, the standard is 3 x 6 inches. Also, other meshes as desired. All sheets 4 feet wide, and any length specified that can be loaded in cars.

Samples will be sent upon request.

We also supply Iron Fences, Fire Escapes, Office Wire Work, and all kinds of Builders' Wire and Iron Work

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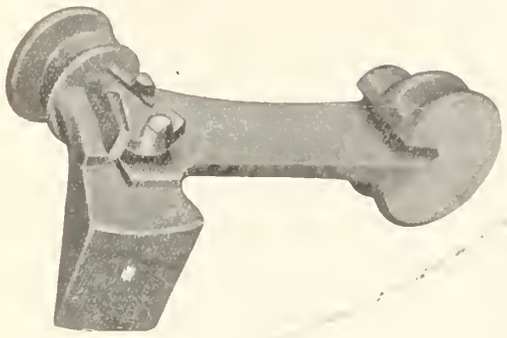
Locomotive Frames **Car Bolsters** **Car Castings** **Heavy Machinery Castings**



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ONE PIECE

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Absolute Efficiency

MADE IN CANADA

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HOME OFFICE, LOUISVILLE, KY.

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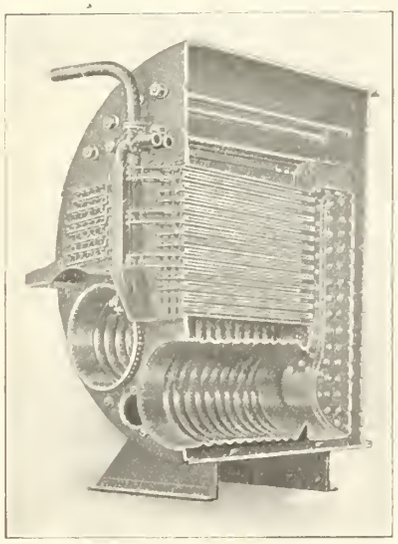

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Saves from 10% to 25% of fuel per unit of power developed. Reduces coal bunker requirement, making possible increased revenue cargo with the same draft.

Increases power output of a given marine power plant from 10% to 25%.

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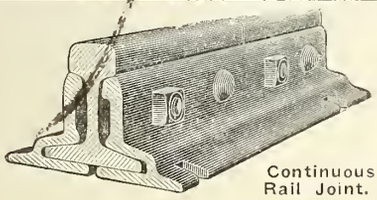

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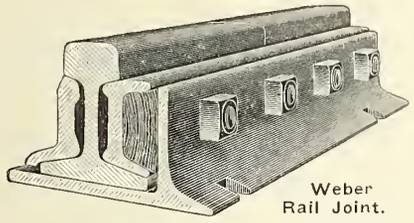

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London, E.C., Eng.	36 New Broad St.

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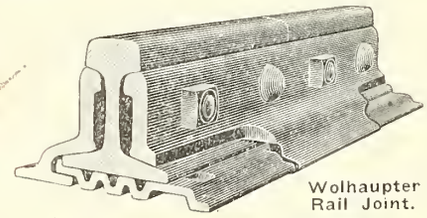

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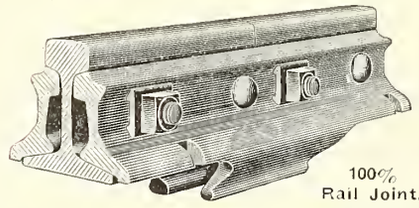

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The Vaughan rail anchor requires no attention after application—the spring, or five member, keeps it always tight.

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Enamelled iron signs, on account of the brilliancy of their colors, attract immediate attention. They never fade and are as good in ten years' time as the day they are put up.

We make to order in any colors, with any lettering or design.

We will be pleased to quote you prices and submit sketches on request.

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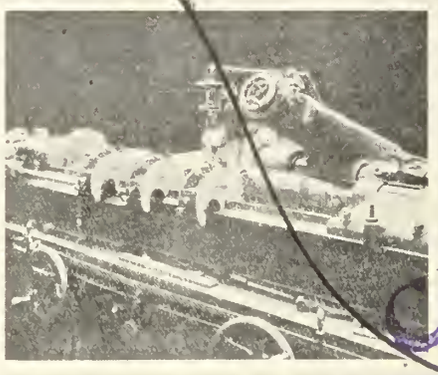

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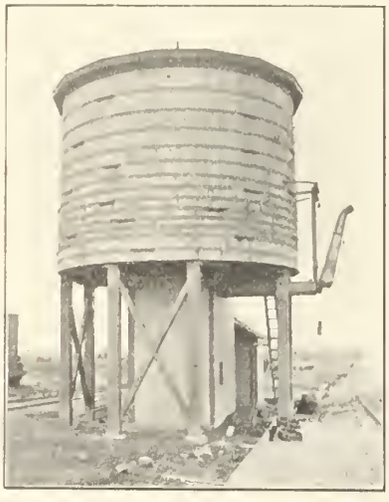

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Steel and Wood Tanks, Towers, Fixtures, Railroad Pumps, Mansfield Water Columns, Gasoline Engines, Cyclone Hoists, Hydraulic Rams.

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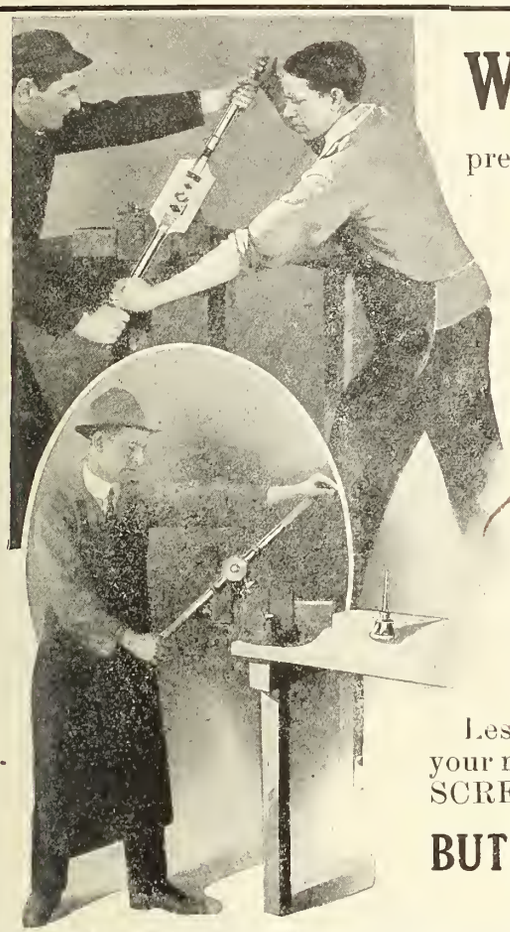

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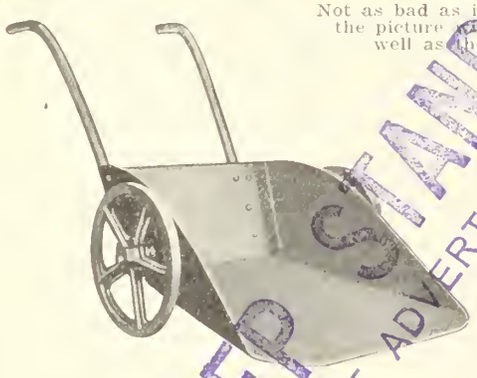
Not as bad as it looks, for they are both laughing—but the picture will give you an idea of the strength, as well as the size of these Box-car Unloaders.



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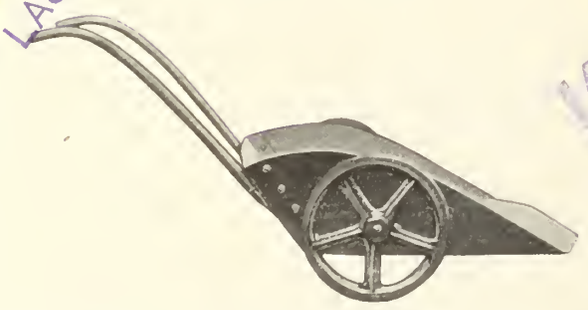
¶ The Tray — about 30" x 30" x 11" deep—is made of heavy sheet steel, the handles of pipe, making the whole Unloader very light and very strong.



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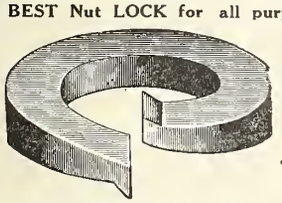

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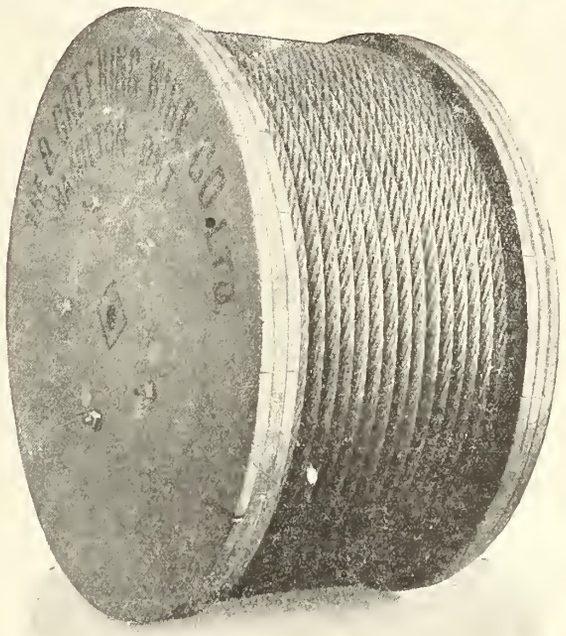

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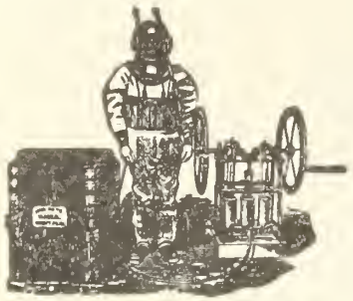

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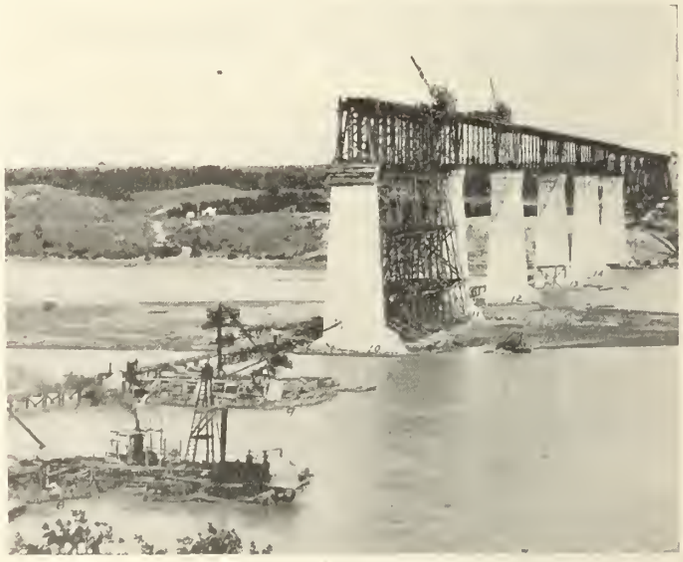

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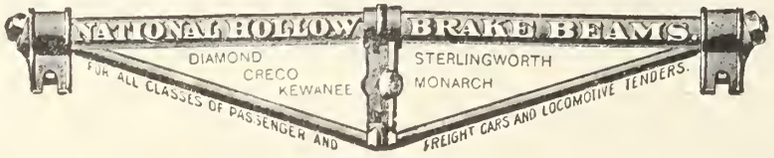

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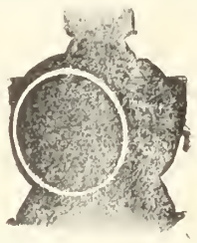

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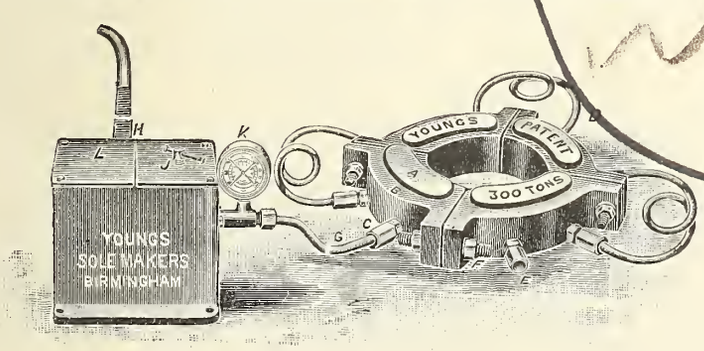

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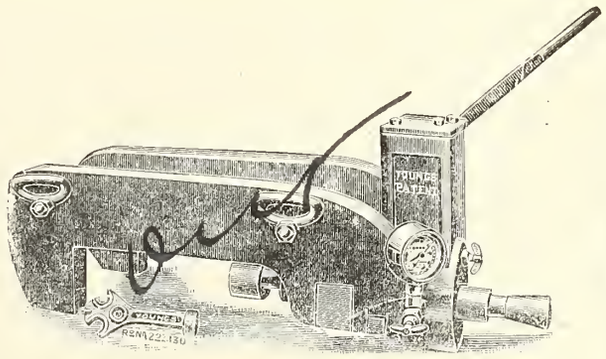

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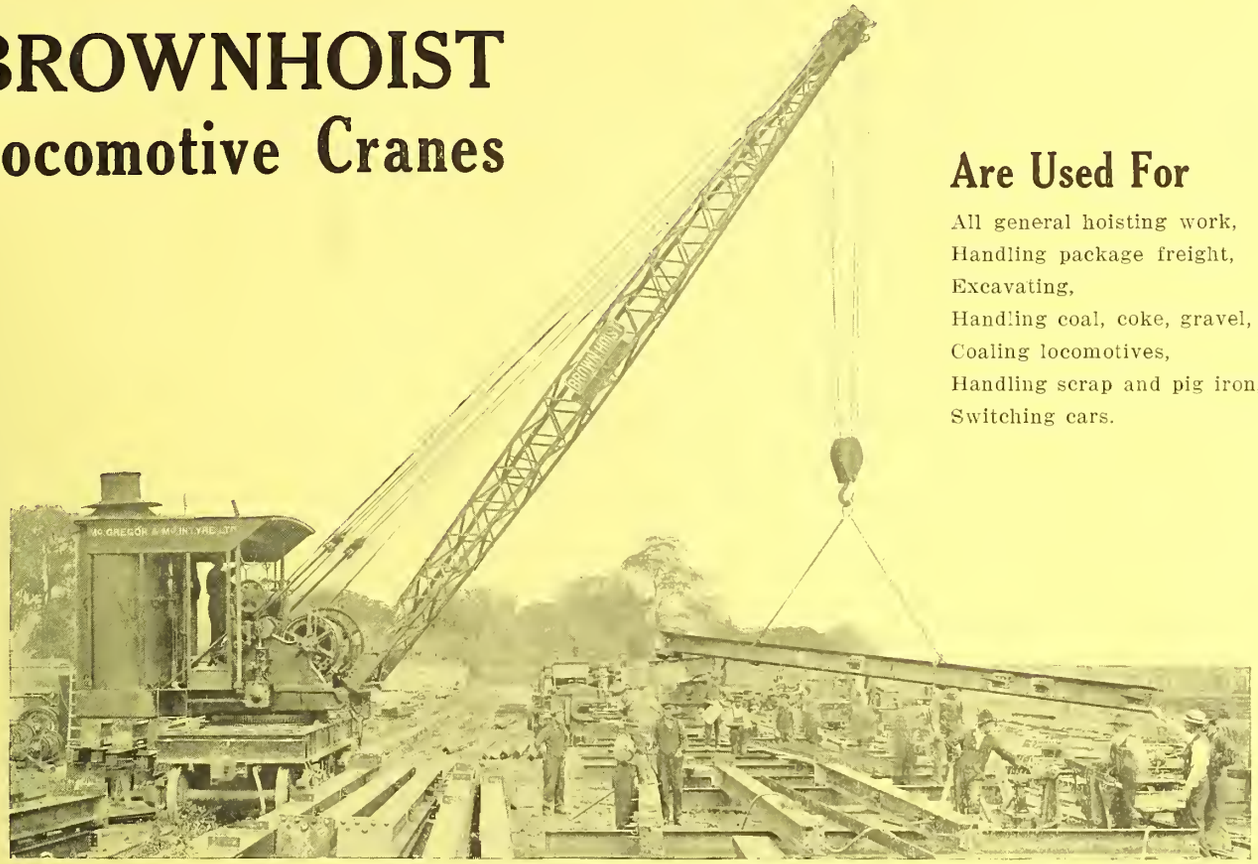

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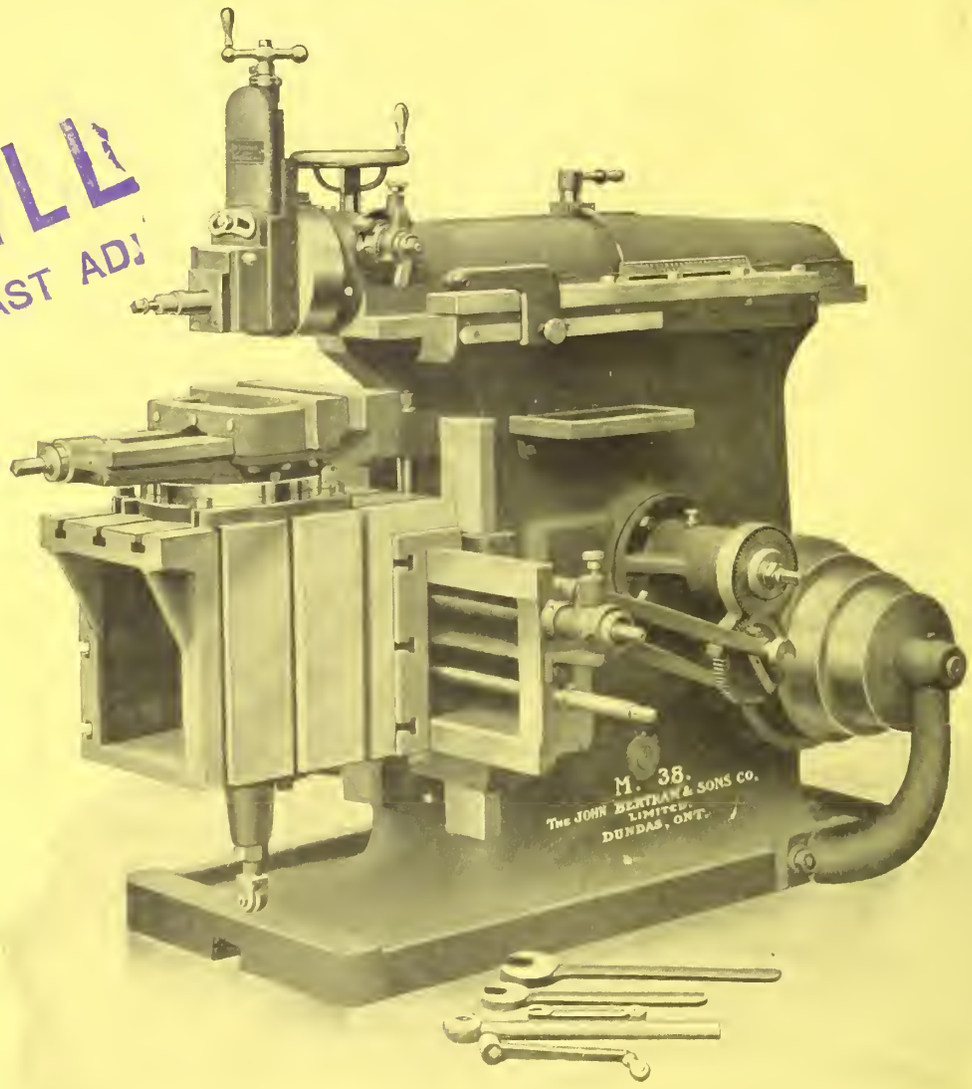

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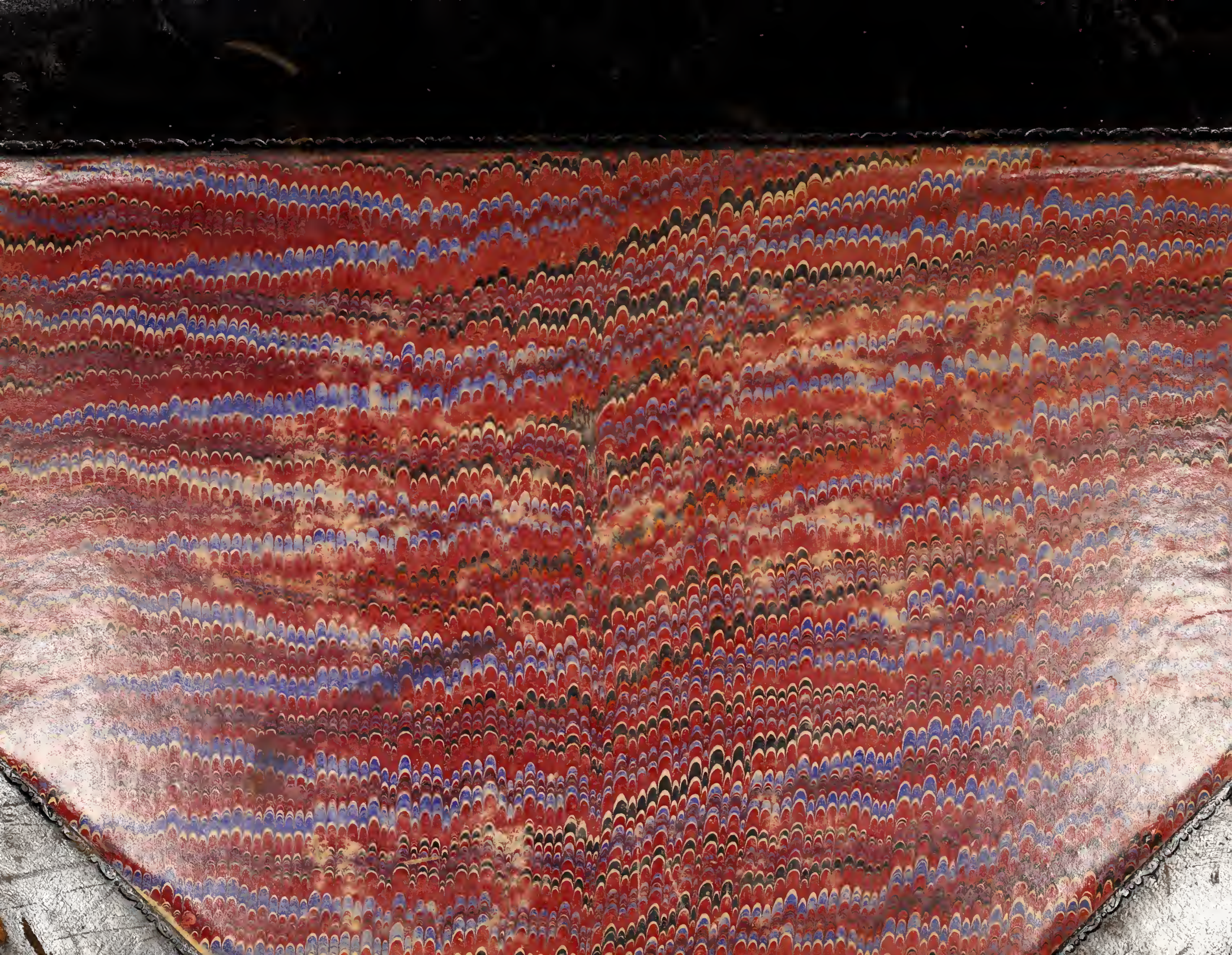
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